McGaw Park Neighborhood Plan

City of Fitchburg, WI

June 9, 2009

Appendices

Prepared by the Consultant Team

TESKA NRC Natural Resources Consulting, Inc. TRAFFIC ANALYSIS & DESIGN, INC. Montgomery Associates

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All appendices are available for review at:
http://www.city.fitchburg.wi.us/planning_zoning/NorthMcGaw.php

Appendix 2A

McGaw Park Neighborhood Plan

Meeting Minutes

McGaw Park Neighborhood Plan Steering Committee

Chair Jay Allen, Mayor
Vice Chair Steve Arnold, District 4 Alder
Patrick Cheney, Resident from Tarpleywick Hills
Randy Christianson, Plan Funding Group
Paul Gramann, Business Owner from Fitchburg Technology Campus
Brian Pleva, Community and Economic Development Authority
Joe Rueden, East Fitchburg Neighborhood Association
Dennis Weidemann, Resident from Quarry Hill
Kris Wetzel, Resident from The Crossing/Waterford Glen
Parks Commission Representatives (alternatively): Scott Endl, Aaron Richardson, & Tom Darcy

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Steering Committee Meeting Minutes 2A-1
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Minutes
North McGaw Neighborhood Plan Steering Committee
May 8, 2008

Present: Jay Allen, Dennis Weidemann, Patrick Cheney, Kris Wetzel, Aaron Richardson (for T Darcy), Brian Pleva, Paul Gramann, Randy Christianson, Joe Rueden

Also Present: Tom Hovel

1. Tom Hovel opened the meeting at 4:00 pm and asked that members introduce themselves.

2. Motion by Patrick C second by Dennis W to appoint Jay Allen as chair was carried.

3. Staff reviews of general planning information:

   Tom H reviewed materials handed out, and the following: Status of Comprehensive Plan; growth level determination on average not to exceed 75 acres per year; balanced neighborhoods; available urban service land at 1000 acres and Northeast Neighborhood Plan process currently underway. Some questions on the information occurred by committee members, particularly on the park and open space proposals, and density.

   Aaron Richardson presented information on parks planning—neighborhood parks within ¼ mile radius of residential uses; Moraine Edge Park concept; wider Parks and Open Space proposal.

   Paul Woodard reviewed the following—water pressure zones in the plan area; future water tower, possibly on high point in Stoneman property; future well required for east zone, but probably be in Greenfield neighborhood; stormwater management and what portions of the study area are currently served by basins but require infiltration and other more up to date storm water management techniques; road connections—Nobel, to Syene, a connection south of Nobel to Fish Hatchery, and connections of Fahey Glen, Notre Dame, Mica to Nobel Drive. It was also explained the expansion of McGaw Park would be provided street frontage by the Notre Dame and Nobel Drive extensions. Mr. Woodard also discussed sewer issues and the areas served by the Syene interceptor and how that interceptor will run, and the area to be served by the Woods Hollow interceptor. Mr. Woodard will have page size versions of his maps made for the committee.

   Discussion occurred by the committee on growth, markets and overall county policies.

Michael Zimmerman presented information on the Fitchburg Technology Neighborhood, and the Fitchburg Technology Campus layout and development.

The committee then broke into car pools to drive to different locations to walk and view parts of the Neighborhood. At each site key factors were pointed out and some discussion occurred. Sites and areas visited were:

Nobel Drive east end, walked east approximately 500'

South end of Fahey Glen walked south approximately 500', where photographs were taken

McGaw Park walked south into Stoneman property along property line with Fahey south to double circuit 138kV line.

Blaney Road, walked to north and east of Hartung operation and down drainage swale to tributary of Swan Creek, where photographs were taken.

Committee convened back at cars on Blaney, and it was noted the next meeting would be 22 May 2008 at City Hall, and will be a four hour meeting with visual preference surveys and block model exercise by the Neighborhood Design Center.

Meeting Adjourned at about 6:40 pm, and members car pooled back to City Hall where they dispersed at about 6:45.

Minutes
North McGaw Neighborhood Plan Steering Committee
May 22, 2008

Present: Jay Allen, Dennis Weidemann, Patrick Cheney, Kris Wetzel, Scott Endl (for T Darcy), Brian Pleva, Paul Gramann, Randy Christianson, Joe Rueden, Steve Arnold

Also Present: Tom Hovel

1. Meeting was called to order at 4:02 p.m. by Chairperson Allen.

2. Motion by Pleva, second by Christianson to approve minutes of 5/8/08, subject to revisions suggested by Cheney relative to one typographical correction and adding "photographs were taken" at two of the site visit locations, was carried.

3. Public comment--none

4. Workshop with Neighborhood Design Center
Ben Carlisle, representing Teska Associates, noted that Teska was the consultant for the neighborhood plan and he would be an observer for the meeting this evening.

Paul Gramman and Steve Arnold arrived about this point.

Steve Steinhoff of the Neighborhood Design Center introduced the process tonight: The first part is an exercise involving assessment of the North McGaw Neighborhood planning area, the middle part is a power point in design, and the last part is the block model exercise.

Site assessment—two teams of committee members of interested public identified the following for the North McGaw Neighborhood: context, assets and issues, infrastructure, phasing. The process was outlined in a handout provided by Steinhoff.

Power point, provided by Steinhoff focused on balanced neighborhoods, land use mix, and design. He noted that at a minimum of 6 dwelling units per acre can start to reduce car trips, and to be transit friendly 12-15 units per acre is required. Density alone is not enough and that location and design are also important. He also talked about certain sustainability methods.

5. Block model exercise--the committee, and interested public, broke into two groups each with a different area (one with a focus on Fitchburg Tech Campus area, and the other mainly on part of the T Wall property). Under this exercise each group

designated open space corridors and networks, primary street network, a neighborhood “center”, employment center, land uses, block layout, and then placement of buildings and parking on the map. Photographs of the exercise were taken by Neighborhood Design Center.

At the end of this exercise Michael Stumpf reviewed a spreadsheet of the impact of a mythical neighborhood land use mix as determined by the group.

Next meeting was noted as June 5, 2008.

Patrick Cheney asked that FACT broadcast the meetings, and Chairperson Allen noted that they were asked to do so for that evening meeting. Cheney asked that agendas note if FACT will broadcast the meetings, to which Allen responded that matter will have to be decided by others as a matter of city practice.

On a motion duly made and seconded the meeting adjourned at about 8:05 p.m.

Minutes
North McGaw Neighborhood Plan Steering Committee
June 5, 2008

Present: Jay Allen, Tom Darcy, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Paul Gramann, Kris Wetzel, Brian Pleva, Dennis Weidemann

Also Present: Jason Schmidt

1. Meeting was called to order at 4:04 p.m. by Chairperson Allen.

2. Motion by Arnold, second by Darcy to approve minutes of 5/22/08. Motion carried.

   Allen had the Committee members give a brief introduction.

3. Public comment—none

4. Overview of timeline, public participation matrix and process –

   Lee Brown, President of Teska Associates, went over the timeline for the meetings and topics the Steering Committee would be involved with. He touched briefly on the process with producing different growth model alternatives and even going further in producing sub areas, which will all meet the comprehensive plan requirements, by the end of August.

5. Roles and responsibilities –

   Allen stated the major role of the Plan Commission in the Northeast Neighborhood with having to deal with controversial issues and major timing factors, which has led to the extension of the plan.

   He stated that the goal of the Steering Committee for the North McGaw Park Neighborhood Plan is to tackle the controversial planning issues in reaching a consensus or options prior to the Plan Commission meeting.

6. Visioning Exercise –

   Scott Goldstein, Principal – Teska Associates, led the group in the visioning exercise group. The first simulation was the one word game, which had the committee members define the neighborhood as they see it today and another word for how they define the neighborhood in the future.

Now:

* fragmented	* rural	* farmland
* potential	* open	* opportunity
* rolling	* countryside	* undeveloped
* recreation	* lots-of-potential	* diverse
* transitional	* historic	* resources
* challenging	* open-space	

Future:

* recreation	* urban	* countryside
* urbane	* marketability	* livable
* business	* desirable	* job-creation
* quiet	* employment	* economically-feasible
* diverse	* balanced	* precedent
* functional	* transitioning	

Discussion was held regarding how these words connect to Fitchburg and the reasoning for the one word answers.

Goldstein questioned the goals for the environment within the neighborhood.

Discussion evolved around tying the neighborhood in with the Parks and Open Space Proposal, minimizing adverse affects on neighboring assets, sustainable – green building perspective, groundwater budget maintained and infiltration, carbon neutral, preservation of heritage trees and urban forest, restoration, and air quality.

Goldstein questioned the goals for the economy within the neighborhood.

Discussion evolved around generating tax revenues for own city services, meeting a variety of business needs, economically viable businesses, economic integration of housing types and prices, and the flexibility.

Goldstein questioned the goals for jobs and offices within the neighborhood.

Discussion evolved around high quality buildings, businesses that serve all of the labor pool, the positives of local power generation, free flow design, well paying jobs, financial assistance, structured parking, work force housing, aspect of public transit and uses not appropriate within the neighborhood such as mineral extraction and hard industrial.

Goldstein questioned the goals for community character within the neighborhood.

Discussion evolved around the current draw of the parks system in bringing people together, a neighborhood school, glacier topography, diversity of design, development that fits the current landscape, park type features, and safety issues.

Goldstein stated that he would be reporting the goals and exercise back to the committee in a workable format to help guide the neighborhood process.

Next meting was noted as June 19, 2008 at 4:00 p.m. with the request from Robert Montgomery, Principal of Montgomery Associates, to have the Parks Department present the Parks and Open Space Proposal at this meeting.

It was also stated that the open house, public information meeting will be held on June 19 from 6:30-8:30 p.m.

Arnold added in that the neighborhood should also take into account the opportunity for local food production.

7. Adjournment – On a motion duly made and seconded the meeting adjourned at about 5:50 p.m.

Minutes
North McGaw Neighborhood Plan Steering Committee
June 19, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Paul Gramann, Vera Wallace (for Kris Wetzel), Brian Pleva, Dennis Weidemann

1. Meeting was called to order at 4:05 p.m. by Steve Arnold

2. Motion by Rueden, second by Gramann to approve minutes of 6/5/08 was carried.

3. Public comment—none
   Allen arrived at this point, and took over as meeting Chair.

4. Park and open Space Proposal—Ed Bartell gave a presentation on the proposed park and open space proposal with a concentration on the areas most affected by the N McGaw Park neighborhood planning process. He discussed the criteria that went into the plan and the evolution of the proposal. Handouts were provided which will be placed on the web site. Questions by committee members occurred regarding buffers of streams and wetlands, land area being added to McGaw Park, and the amount of total land in the open space proposal.

5. Bike and Pedestrian Plan information – Ahna Bizjak provided background on goals and policies of the draft comprehensive plan relevant to the installation of new bicycle and pedestrian facilities. She also provided a map indicating potential linkages of multi-use paths and what is in the proposed Bike and Ped plan as opposed to what will be looked at for this neighborhood. Handout was provided which will be posted to the web site. She noted all streets are to be designed for bicycles and pedestrians. The Committee had questions on locations of paths in or near the power line easement, and location of off street paths. Some discussion occurred regarding a bike and pedestrian grid system.

6. Environmental Issues and Opportunities—Steve G. from Montgomery Associates provided background on data collected to date relative to water resources and ecology and 8 sampling locations for the aquatic resources and what it is hoped to learn from the sampling. He also provided a few photos of Swan and Murphy Creek, before and after the major rains in the first week of June 2008. He also discussed ground water hydrology and flow as discerned by Sue Swanson, PhD.

Jeff K. and Mellissa of NRC noted that about 60% of the area has been reviewed for woodland and specimen trees, and woodlot evaluation. They will revisit for woodland and plant understory inventories in August. They noted WIDNR opinion of potential rare or threatened species that may exist in the planning area. They did note that the flooding that occurred has placed them behind in wetland delineation and evaluation. They noted the WIDNR will be out within the next week for determinations of navigability. They noted that wetland buffers will be evaluated based on findings in the field. It was noted that the Haas will not allow access to their property for evaluation of the resources that may be present on their site. NRC will undertake sample plot plant inventories, look for wildlife habitat occurrences and undertake evaluation of fish.

They also discussed the cultural and archaeological information received to date, and noted only one local historic site being located in the planning area as of this stage of their investigation.

7. Land Use—This item focused on goal discussion particularly housing, natural resources and agricultural. It was noted that the area will take many years to phase in, therefore, agricultural and natural resources will be important for the interim time frame before development occurs. Some discussion occurred regarding types and variety of housing to be provided, and transitions between land uses. Scott Goldstein of Teksa noted that about 84% of the planning area is in agricultural land use. The Committee agreed to discuss this further at their 7/24 meeting. It was acknowledged that the goals and policies need to be consistent with the comprehensive plan, although the neighborhood plan goals and policies can be more detailed.

8. Feedback from interviews to date—Scott Goldstein noted they have interviewed 16 persons to date and could possibly interview a few more on 7/10. There is a desire, from those interviewed, for a variety and diversity of housing types. There is also concern over some city environmental regulations, but most other than that most opinions were generally consistent with goals and policies of the draft Comprehensive Plan and those for the neighborhood as expressed by the steering committee at its 6/5 meeting.

   A brief discussion occurred on items for the 7/10 steering committee meeting and it was decided to place the Comp Plan Presentation on 7/24, to allow Teska Associates more time to discuss service, utility and other issues with the committee.

9. Adjournment – Motion by Pleva, second by Arnold to adjourn was carried at 6:05 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
July 10, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Samuel Cooke (for Joe Rueden), Kris Wetzel, Brian Pleva, Dennis Weidemann, Tom Darcy, Paul Gramman
Also Present: Matt Steigman

1. Meeting was called to order at 4:04 p.m. by Chairperson Allen.

2. Motion by Allen, second by Cheney to approve minutes of 6/19/08 was carried. Cheney commented on the minutes from the 6/19/08 Public Information meeting – requesting that when possible, the questions raised at the Public Information meeting be accompanied in the minutes by the answers provided.

3. Public comment – Committee member Randy Christianson stated his concern about the level of attendance at the June 19th Public Information meeting. It was stated that everyone within the study area, and within a 300 ft. buffer around the study area (over 200 people), was mailed a meeting notice. Christianson suggested more could be done to increase attendance, including neighborhood residents on the committee going door-to-door.

A video-tape of the June 19th Public Information Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

The Issues and Opportunities Report includes much of the information covered at this meeting: http://www.teskaassociates.com/fitchburg/Docs/Issues%20and%20Opportunities%20070808.pdf

4. Economic Development Information – Michael Zimmerman (Economic Development Coordinator for the City) gave a presentation which, first, summarized the history and current status of relevant economic statistics and trends, highlighting the successful economic growth of Fitchburg and the need to increase the inventory of commercial lots to maintain that growth (Office Market Trends handout was distributed). Secondly, the city's public/private partnership approach to economic development was described as prioritizing quality over quantity in the pursuit of creating a full service city. Thirdly, the current status and vision for developments surrounding the NMP neighborhood was outlined, including the desire to quickly expand the Technology Campus into the NMP neighborhood. Finally, a discussion of how all of the above should impact the NMP neighborhood plan unfolded, including in particular a discussion of neighborhood scale retail and how to assess its viability. Allen noted the need to think first about how the neighborhood should look and what it would be able to support, rather than to begin by assessing which businesses would best fit with the broader business community or match with the marketplace analysis. (Claritas MarketPlace analysis was distributed at this point). Randy Christianson requested this presentation be made at the Neighborhood Summit on 8/21. The presentation will be placed on the Teska website: http://www.teskaassociates.com/fitchburg/documents.htm.

5. Transportation Issues and Opportunities – Michael May (from Traffic Analysis & Design, Inc.) briefly discussed the need for transportation planning and particularly the value of considering multi-modal transportation. Discussion occurred regarding the location (diagonal vs. straight) of the proposed Nobel Drive extension, the existing problems with Lacy Road, and the desire to fix Lacy (without widening it) and avoid those same problems on Nobel (i.e.: driveways on a road too busy and with traffic too fast to accommodate them). A request was made for further discussion of the placement of Nobel, including the results of the Model Block Workshop, or another similar exercise if necessary.

6. Environmental Issues and Opportunities – Steve Gaffield from Montgomery Associates provided a brief summary of the water resource issues and opportunities, particularly how land-use changes impact groundwater and surface water (pollution and runoff), and the need to understand the issue holistically as a water budget or hydrologic cycle. Management strategies were outlined, including moving away from detention and toward more infiltration with a multi-element approach that includes treatment near the source, open space, integration of stormwater management into landscaping, and raingardens. Steve also noted that he expected to retrieve information on 7/11 from the monitoring equipment in the field. The slides from this item are on the Teska website, titled: McGaw Park Neighborhood Plan Presentation.

   Tom and Melissa of NRC discussed the wetlands and woodland communities respectively. Tom discussed each of the seven waterway features numbered on a map distributed at this time, 5 of which are non-navigable and 2 are navigable. They were able to predict their recommendations/suggestions on buffers for each (300 ft. for swan creek and 75 ft. for the stream immediately east of McGaw Park). It was requested that a map be produced to show where each waterway is navigable or not – Tom said the DNR does not usually map large areas in this way, but that the classifications would firm-up as their analysis progresses. Discussion occurred regarding the definition of ‘navigable’ and Tom indicated that the designation by the DNR is rather subjective. Kris Wetzel indicated her dislike of Raingardens. It was noted that one additional wetland on the eastern most boundary of the study area requires more analysis.

   Melissa explained how specimen/heritage trees are identified and noted that a number of trees in the study area may qualify (they are represented on the map cited above). The seven woodland communities were described and images were shown, including what can be done to improve each community, particularly removing honeysuckle and box elder and replacing with native species that will be less invasive. It was also noted than an additional woodland community was identified southeast of McGaw Park, on the Stoneman Family Farm LLC, that requires more analysis.

7. Examples of Density Levels – Scott Goldstein from Teska Associates gave a presentation on the Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) rating system, describing that it not only includes environmental building design and materials, but also environmentally conscious location and neighborhood design. Four criteria for qualifying for LEED-ND were outlined, and proposals for meeting the smart location requirement were discussed – particularly re-routing the bus routes through the west side of the study area and establishing light-rail or express bus service on the eastern edge. Images of a range of densities were then displayed to illustrate the importance

of design and to provide various examples of how NMP might look. The LEED-ND presentation and the density images will be available on the Teska website.

Next meeting was noted as July 24th.

8. Adjournment – Motion by Allen, second by Christianson to adjourn was carried at 6:25 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
July 24, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Brian Pleva, Dennis Weidemann, Scott Endl (for Tom Darcy)
Also Present: Matt Steigman

1. Meeting was called to order at 4:04 p.m. by Chairperson Allen.

2. Motion by Allen, second by Arnold to approve minutes of 7/10/08 was carried. (Several edits were noted.)

3. Public comment – None

4. Comprehensive Plan Information – City Planner Thomas Hovel provided an account of the development of the Comprehensive Plan, including the major steps that have led to its Vision Statement and Major Goals. Data was provided to further explain those goals, stress their importance, and highlight some challenges of implementation. The major goals are: limit growth to 75 acre/year on average, focus on transit oriented or transit friendly development, examine PDR/TDR program, preserve natural resources and open space, create balanced neighborhoods, and a balanced transportation system. A discussion then evolved around the desirability of some of the goals, the impact of zoning codes, the relative merit of traditional vs. suburban developments, and the viability of neighborhood retail. More information on the Comprehensive Plan can be found on the City website: http://www.city.fitchburg.wi.us/planning_zoning/NorthMcGaw.php

5. Review Model Block Workshop Report from NDC – Steve Steinhoff reviewed his report, highlighting the issues that needed to be resolved to complete the exercise and produce a model that was consistent with the goals of the Comprehensive Plan. Some techniques that can be used to achieve those goals were also addressed. It was noted that both development areas in the exercise had densities far above the 7du/ac minimum average in the Comp Plan, one at 14du/ac and the other at 18du/ac. A discussion evolved around how to achieve high levels of density and what might be some of the drawbacks of doing so. This report can also be found on the City website: http://www.city.fitchburg.wi.us/planning_zoning/NorthMcGaw.php

6. Density Model Discussion – with very little time remaining, it was decided to address this issue at the 8/7 Steering Committee meeting. At that meeting both the Land Use Design & Density Presentation slides, as well as the Land Use & LEED Presentation slides will be reviewed (both are available on the Teska website). It was also requested that Teska bring the dot-voting boards from the First Neighborhood Summit (July 10th) to

help facilitate the discussion of the minutes from that event. Jay asked everyone to think about which LEED-ND certification level to shoot for, and to that end the LEED-ND Pilot Rating System document has been placed on the Teska website: http://www.teskaassociates.com/fitchburg/documents.htm.

Next meeting was noted as August 7th, 2008.

7. Adjournment – Motion by Arnold, second by Allen to adjourn was carried at 6:07 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
August 7, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Brian Pleva, Dennis Weidemann, Tom Darcy, Kris Wetzel, Paul Gramann.

Also Present: Matt Steigman

1. Meeting was called to order at 4:03 p.m. by Chairperson Allen.

2. Motion by Arnold, second by Pleva to approve Minutes of 7/24/08 was carried.

3. Discussion of 7/10/2008 Neighborhood Summit Minutes – removed from agenda.

4. Public comment – None

5. Growth Model Constraints and Opportunities – Scott Goldstein from Teska Associates provided an overview of the major elements shaping the plan: environmental resources, stormwater capacity, and transportation (LEED-ND was moved to the end of the agenda). The Constraints and Opportunities map, along with the growth models discussed in Agenda items 6 and 7 below, will be available on the Teska website: http://www.teskaassociates.com/fitchburg/documents.htm

    a. Environmental Resources - The navigable waterways requiring 300 ft. buffers were identified, as were the woodland communities containing specimen or heritage trees that require protection. It was stated that the buffer required for the waterway cutting through the Rueden property was a 75ft. corridor on its west end (where it is non-navigable and intermittent), and that beginning roughly in the middle of the Rueden property it requires a 75ft. buffer on both sides (where it is navigable and intermittent). It was determined that discrepancies in this terminology need to be reconciled. Scott explained that the increased infiltration area on the constraints map resulted from the NRC's finding that Swan Creek is in excellent condition and that extra care should be taken to limit stream blowout.
    b. Stormwater Capacity - The limitation, stemming from sanitary sewer capacity, of 4du/ac gross density on the west-side of the study area (for the Woods Hollow interceptor) was questioned and Jay Allen requested a re-examination of the possibility of expanding the capacity of that interceptor.
    d. Transportation - The need for a bus route in the west part of the study area and light-rail in the east, required for meeting LEED-ND certification, were explained. Discussion then evolved around the intersection of Syene with the Nobel extension (or whatever road becomes the east-west corridor within the study area), including the extent of the McGaw Park addition and the route of the Bike Path.

6. Growth Model Alternatives – Scott Goldstein presented the three major alternatives, each with 2 or 3 options.

7. Steering Committee Feedback on Preferred Alternative – After a discussion of the models, a consensus began to emerge that included:

    a. The major node for the plan should surround the wetland at the corner of Lacy and Syene. Suggestions for this area included expanding the Mixed Use area from how it's represented on the 1 and 2 series models to include land on the west side of Syene, and also moving the Transit Station to just south of the wetland to be closer to the rail tracks and further from the next stop to the north.
    b. A second, smaller Mixed Use node should be at the western most part of the study area. Questions were raised about the economic feasibility of retail in this area, an opinion was expressed that Fahey Glen, running north-south, would increase the feasibility of retail and office space.
    c. Some extension of the Business Park is appropriate.
    d. Something should be put in place to take advantage of the traffic flow at the potential traffic circle south of Fahey, where the north-south and east-west roads intersect. Suggestions included an institutional land-use like a school, or a park.

    Other questions and issues raised:

    a. Do the residential areas need to prohibit commercial uses, or can the plan include more flexibility?
    b. There is a highpoint with a view of the capital that should be protected (south of McGaw Park, almost to the power lines).
    c. The notch cutting into Moraine Edge Park along the power lines (south of McGaw Park) on some of the models was questioned.
    d. Committee members Wetzel and Christianson requested another opportunity to comment on the models, after the Public Summit on August 21, when the growth models will have been narrowed down and their comments have been integrated.

    LEED-ND (moved from Agenda Item 5.c.) – Scott Goldstein presented the LEED-ND rating system, including which criteria would be possible to achieve for this plan. It was established that the Silver level certification would be the goal of the plan. It was clarified that LEED-ND certification is based on the plan and is granted before construction, but that LEED certification for particular buildings occurs only after construction; furthermore, it was clarified that the Green Construction and Technology criteria for LEED-ND would require covenants or ordinances to compel developers to comply.

    Randy Christianson requested more examples of LEED-ND plans for scenarios similar to the North McGaw Neighborhood.

    Next meeting was noted as August 21st 2008, followed by the 2nd Neighborhood Summit.

8. Adjournment – Motion by Allen, second by Arnold to adjourn was carried at 6:04 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
August 21, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Stewart Brown (for Brian Pleva), Dennis Weidemann, Tom Darcy, Kris Wetzel, Paul Gramann.

Also Present: Matt Steigman

1. Meeting was called to order at 4:04 p.m. by Chairperson Allen.

2. Motion by Gramann, second by Christianson to approve Minutes of 8/07/08 was carried.

3. Public comment – None

4. Growth Model Concepts – Scott Goldstein from Teska Associates provided a brief overview of the timeline for the plan process, indicating that we are at the stage of firming-up the land use model and moving into GIS analysis, such that the Traffic Impact Analysis can begin. The established goals and 'opportunities and constraints' of the plan were outlined, and then Scott presented the recent and upcoming changes to the Opportunities and Constraints map which forms the basis for the growth model concepts. Those changes include moving the 300ft. buffer along Swan Creek on the east side of the study area to buffer the wetland boundary, rather than the creek, which effectively enlarges the protected area slightly. The appropriate buffers for the stream on the Rueden property were fixed, and the notch missing from Moraine Edge Park south of the study area (south of McGaw Park) will be added into the Moraine Edge Park. Cheney reiterated his desire to maintain the McGaw Park extension all the way to Syene Road. Scott and Jay Allen also discussed possible changes to the expected limitations imposed by the sanitary capacity, and how this may do more to determine phasing than actual land use as previously thought. This issue was left open as more analysis needs to be done by the city engineers.

   Steve Gaffield from Montgomery Associates provided a detailed account of the state of the relevant wetlands: Swan Creek, South Branch, and Murphy's Creek. How these waterways relate to the study area, as well as some background information such as explanations of baseflow and infiltration were provided. It was reported that these waterways are healthy, without signs of 'blow out' from runoff, and that they are cool water creeks with a mix of coldwater and warmwater fish. The suggested water management goals were outlined: to maintain groundwater recharge and minimize runoff. The Dane County ordinance setting the targets for infiltration and regulating the mechanisms to achieve these targets was described. As a percentage of pre-development infiltration, the ordinance calls for 60% for non-residential and 90% for residential. The required site area for infiltration devices is 1% for residential and 2% for non-residential. A discussion then evolved around how these targets can be met and what precisely the

ordinance means in terms of implementation, if the ordinance should be exceeded (as with 2% or 3% of the site area used for infiltration devices as recommended by Montgomery Associates), and which land uses are likely to have what impact on infiltration. It was noted that higher density development can actually reduce the amount of impervious surface and thus be better for infiltration rates. Jay Allen suggested a 90% infiltration rate target for all sites (or for a larger area average). Steve Arnold suggested thinking in terms of being recharge neutral, pointing out that even with 100% pre-development infiltration rates, increased usage could lower the water table.

Feedback from 8/7 Steering Committee Meeting – Scott Goldstein introduced to the committee how the established goals and the 'opportunities and constraints' can be applied, and how they relate to the comments received on the first round of concept plans. It was determined that the comment summary accurately reflected the comments received to date. They are as follows: housing too close to US14 is not optimum use of land and commercial and business uses are preferred; mixed use needs to be defined; Nobel should be straight in the Fitchburg Technology Campus; a road is needed along the power-lines (on southern border of study area); a minor road along the McGaw Park expansion could be added. The discussion then evolved around how the comments, goals, and constraints would be applied. The issues raised included how to better conceptualize mixed use, and that it might better be understood as Transit Oriented Development to indicate that not every building needs to have multiple uses. Some time was then spent listing what might be included in both Mixed Use areas. The larger eastern node might include: a smaller/medium sized grocery store (50,000 to 60,000 square feet), smaller retail like a dry cleaner, possibly light industrial as long as the employment count was relatively high, and the possibility of live/work spaces which might include medical services or accounting/legal services. The smaller western Mixed Use area would be much less retail oriented and focus on office space and relatively compact housing. The road system was discussed, particularly the difficultly of generating sufficient north-south routes; it was noted that Caine Road most likely cannot extend north. The issue of transitions was raised, particularly how to buffer the power-lines and the business park. Finally, the issue was raised that the plan should not be over dependant on light-rail because it may never materialize; in response, a comment was made that bus rapid transit could be put in place with relatively little expense until the rail is operational.

Revised Alternative Concepts – At this point Scott presented the latest round of conceptual bubble diagrams for land use.

5. Steering Committee Feedback on Preferred Concept –
    a. Concept One: The smooth curve of the road here is preferred by some, as it may draw more traffic from Lacy Rd. than the other concepts. The Park and Open Space (PO) area in the northeast corner of this diagram was questioned for being too close to protected green space, which opened into a discussion of how much park space is required, with some people clearly thinking there is too much PO across the concepts. It was also reiterated that residential too close to US14 might be problematic, although a precise distance was not discussed.
    b. Concept Two: This road system was preferred by some, particularly for moving away from a single arterial and more toward dispersing the traffic into a street

network (capillary circulation over arterial circulation). It also creates square lots for the Business Park area. Nobel dipping so low caused concern that people would not use it and continue to rely on Lacy. It was recommended that the higher density residential along the southern border in the middle of the study area be switched to lower-density residential.

c. Concept Three: Here again the issue of the power-lines came up, and how difficult it might or might not be to sell homes there.

One concern that was mentioned several times was the relationship between the eastern node and Green Tech Village, both in terms of the transit stops and land use.

Next meeting was noted as September 4st 2008.

8. Adjournment – Motion by Rueden, second by Allen to adjourn was carried at 6:23 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
September 04, 2008

Present: Jay Allen, Patrick Cheney, Steve Arnold, Randy Christianson, Joe Rueden, Brian Pleva, Dennis Weidemann, Kris Wetzel.

Also Present: Matt Steigman

1. Meeting was called to order at 4:02 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 8/21/08 was carried. Cheney stated that he believes the decision in the previous Steering Committee Meeting, to add to Moraine Edge Park the notch extending south from the study area (south of McGaw Park, as noted in the 8/21/08 Minutes under Agenda Item Four), was made erroneously. He believes that there were three options for this notch: to add it to Moraine Edge Park, to add it to the NMP study area, or to leave it out of both. Cheney feels there was neither a compelling argument nor real desire to add the notch to NMP or Moraine Edge Park and that we should have maintained maximum flexibility by picking option three.

3. Public comment – None

   The new Growth Model Concepts discussed below with their respective Build-out Analysis, the final Growth Model (agreed upon at this meeting) with its respective Build-out Analysis, as well as the latest Sanitary Sewer Map will be available on the Teska Associates website: http://www.teskaassociates.com/fitchburg/documents.htm

4. Growth Model Concepts – Scott Goldstein from Teska Associates provided a brief overview of how the newest versions of the growth model (4, 4A and 5) were devised. This included reviewing the Opportunities and Constraints Map and how the constraints reflect the findings shown on the NRC Field Collected Data Map. It was noted in particular that the notch protruding south from the McGaw Park extension is comprised of specimen and heritage trees and that it should in fact be protected with the designation as an Environmentally Sensitive area.

   Growth Model Concept 4 was then reviewed. It was explained that this concept reflects the feedback received at the August 21 Steering Committee meeting and Public Summit; particularly, the desire for a transit oriented development node near the proposed light-rail station, and a more specific definition of Mixed Use on the west side of the study area. The discussion evolved around the route of Nobel drive. Questions were raised regarding the feasibility of the proposed route and the significance of Nobel to the entire plan. The Nobel-Lacy intersection was discussed, as was the nature of working with

DOT, including the differing opinions on the future of Lacy Road wherein DOT would like to see it become an arterial for the US14 Lacy interchange while the City of Fitchburg wants to draw traffic to Nobel. It was also noted that transit oriented development (TOD) will require a specific definition, particularly regarding dwelling-units/acre, total dwelling units required, and the ratio between dwelling units and commercial square-footage, but that LEED-ND is a valuable, quantified standard that can inform the definition of TOD.

Growth Model Concept 4A was displayed at this point. It was noted that the major change from Concept 4 was that the Business Park (BP) area on the west side of the study area was extended into the western most portion of the Mixed Use area south of the existing BP. The Initial Build-out Analysis for 4A was reviewed, including an explanation of the assumptions made to generate the figures. Some of those assumptions include: R1 averages 5 du/ac, R2 averages 10 du/ac, all non-residential has .5 Floor Area Ratio, TOD and MU residential average 12 du/ac. Steve Arnold questioned the 14% of land dedicated to Park and Open Space (PO), as some of the dedicated park space for the area is actually outside the study area. Scott believes this was taken into account by halving the usual 28% of PO. A brief discussion of park policy followed, raising questions about how this area will compare nationally and again citing the need to change the City's park policy to achieve desirable densities. The mix of uses in the TOD was discussed, and the 6 acres of retail was explained as reflecting the need only for neighborhood scale retail, such as a small to medium sized grocery store, as larger big box stores could be close by in Green Tech Village. Scott Goldstein stated that the overall findings indicate that this concept has too much commercial space and too few dwelling units. Randy Christianson reiterated the need for flexibility, as high density may not sell well in this area.

Jay Allen explained Growth Model Concept 5, accounting for his edits of Concept 4, which he described in an earlier email as "a conglomeration of various concerns I have assembled over the last two weeks from the Plan Commission, Committee of the Whole, and some smaller meetings with committee members and stake holders. My changes are in RED. This map contains only the things that I believe we have a consensus on." Some of the edits require further explanation: It was noted that what is represented on the growth model as a 'Landscaped Buffer/Transition' is really just highlighting the need for a transition, and not specifying a particular land use; the 'move PO' in the west BP indicates the desire to have the PO align with the existing tree-line; the large red dot along the power-lines indicates the desire to restrict land uses on a scenic highpoint with a view; and finally 'remove park' in the east refers to the need to rewrite City park policy to reflect the requirements of TOD. It was noted that the Build-out Analysis for Concept 5 probably still has too much commercial space when GTV and NEN are taken into account. Questions arose about the proper ratio of dwelling units to commercial square footage, as well as concern that the TOD area has too few dwelling units to support a transit stop. It was estimated that the requirement is between 500-600 du, but that even with increasing du/ac to 18 in this area and adding in the R1 and R2 would still fall short. The Mixed Use designation was discussed, and it was decided that it is a useful designation because it allows BP uses without precluding the possibility of retail, but also allows for higher density housing. For these reasons, the MU areas added to Concept 5 in the south-west part of the study area

were retained. It was noted that the Build-out Analysis does not reflect stacked uses, and that more detailed analysis will take this into account.

Chris Armstrong, representing the Fitchburg Tech Campus, stated that the .5 FAR requirement is problematic because companies don't want office space in 3 and 4 story buildings because of HVAC requirements, and some companies don't want parking underneath because of floor vibrations. This propelled a discussion of the city parking policy: that it will need to be lowered and made more flexible to allow shared parking as the current policy requires too many spots and is a hindrance to achieving the desirable level of density.

Dennis Weidemann questioned if it is possible to put Nobel drive along the south border of McGaw Park, between McGaw Park and the specimen/heritage trees just to the south. The discussion evolved around the placement of Nobel, with the final decision being that Nobel would go south of the woodland in question but stay as far north as possible. It was further decided that the woodland in question, the notch protruding south from the McGaw Park extension, will be designated as an Environmentally Sensitive area. The placement of Nobel in the west BP was also discussed and Scott Kelly relayed to the committee the most desirable placement from the point of view of the BP. In agreement with Scott Kelly's analysis it was decided that extending the existing Nobel Drive from where it ends now is the best option, because extending it straight, about two-thirds the way to the north extent of the property, will allow for high density commercial south of Nobel and a buffer with the existing neighborhood north of Nobel.

Other changes to Concept 5 included moving the round-about slightly north, and making the south Institutional use larger (as large as 12 acres to accommodate a school). The north Institutional use will change to R2. It was decided that the Tarpleywick Hills neighborhood would retain its R1 designation, but that language would be added to the plan to indicate that density there should increase overtime to reflect its proximity to both the transit station and higher density developments.

5. Sanitary Service Options – the new sanitary sewer map was briefly discussed including its implications for phasing: that the area south of the proposed west BP will be the last area with service, but that the Woods Hollow interceptor can be extended south depending the extent of usage to the north. This map will be added to the Teska website: http://www.teskaassociates.com/fitchburg/documents.htm

6. Final Comments of Steering Committee on Selection of Growth Model – this agenda item was moved up in the agenda and addressed within Agenda Item 4.

   Next meeting was noted as September 18th 2008, followed by a Public Information Meeting.

7. Adjournment – Motion by Arnold, second by Cheney to adjourn was carried at 6:02 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
September 18, 2008

Present: Jay Allen, Steve Arnold, Patrick Cheney, Randy Christianson, Joe Rueden, Brian Pleva, Dennis Weidemann, Paul Gramann.

Also Present: Matt Steigman

1. Meeting was called to order at 4:03 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 9/04/08 was carried.

3. Public comment -
   Duane Bowman read the following question to the Committee: "On Sunday, September 14, 2008 the subject article appeared in the Wisconsin State Journal, Section d page 9. It purports to explain the desire of the Mayor of Madison and his plan dealing with population redistribution. Since some of our Alders have closely followed the City of Madison in certain ordinance drafts, will these referenced dispersal plans be incorporated into the neighborhood plan of the North McGaw Neighborhood plan and, possibly, into those of the North East and N. Fish Hatchery Road Neighborhood plan? Thank you for the opportunity to be heard."

   DeFour, Matthew "Mayor's plan moves forward: His idea is to disperse pockets of poverty, but there are legal hurdles." Wisconsin State Journal 14 Sep. 2008: D9.

   Alderman Allen responded by saying that the Mayor's plan might affect Fitchburg's planning, but that Madison has no authority in Fitchburg. He also stated that one goal of the NMP plan is to provide affordable worker housing.

   Alderman Arnold discussed a lecture he had attended by Douglas Farr, President and CEO of Farr Associates Architecture and Urban Design, and Chair of the LEED for Neighborhood Development Core Committee. He said the talk was inspiring and that it crystallized many of the ideas discussed by the North McGaw Park (NMP) Steering Committee. For Arnold, the most important message to take away from the talk was that LEED buildings and new technologies are only half of the solution to the environmental crisis; the other half is a required shift in culture, one that neighborhood design should at least allow for, if not actively encourage. This lecture was part of the 2008 Upper Midwest APA Conference (American Planning Association). For more information please see: http://www.wisconsinplanners.org/events/events.htm

   Randy Davis questioned the necessity of the distinction between R1 and R2 in the Growth Model, and how much flexibility there will be on this in the future. Allen

responded by saying that the distinction is necessary for planning purposes, but that no amendment to the plan would be required if flexibility is written into the text of the plan.

The presentation described below will be added to the Teska website: http://www.teskaassociates.com/fitchburg/documents.htm
A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

4. Natural Resources Investigation - Jeff Kraemer from NRC and Rob Montgomery from Montgomery Associates provided an update on resource analyses, covering the regional monitoring, study area investigations, resource issues to conclude as part of growth model review, and the plan for detailed environmental analysis of the growth model and land use for the study area.
A map of the monitoring sites was displayed and it was noted that the water resources goals are driven by downstream resources. The areas to be covered in this section were identified: continuing stream flow monitoring, biological inventory, and a review of water resource goals. Stream flow monitoring was explained with an example graph in which water temp and water level were charted against time. It was explained that examining the relationship between temperature and water level can reveal how water is getting to the stream. The sample locations for the biotic analysis were mapped, and the mechanisms for making the measurements was described, including taking samples for macro-invertebrates and shocking the stream to get counts of fish to determine the quality of the stream in terms of habitat. The presence of cool water fish and warm water fish indicate that this cool water stream is getting warmer. The biotic analysis and the temp and water level analysis were combined to determine that the South Branch of Swan Creek provides a good quality habitat overall. Swan Creek at Lalor Road was the site studied, and this site was determined to be a poor quality habitat with a high degree of degradation and disturbance. The unusual mix and low counts of both cool and warm water species identified indicate very poor quality cold water habitat. Murphy Creek at Lalor Road was determined to have good quality habitat, with cool, swift moving water and good riparian habitat. The conclusion at this point was that the South Branch of Swan Creek is nice now, but that it is being degraded and is at the breaking point.

Study Area Investigations: Floodplains study, Sanitary Sewer Service, Analysis of Ecological Survey Results - A smaller scale map was then displayed showing the capture areas of springs in the region (from Susan Swanson's PhD research), which underlies the water management analysis. The water management goals were outlined: maintain groundwater recharge, minimize runoff impact on South Branch, and to protect water quality. Starting with the floodplains, a brief update was given on FEMA's progress revising the flood insurance rate maps (FIRMs), which are expected in late 2008, and will require adoption into the City's zoning ordinances by Spring 2009 [correction: by January 2, 2009]. The preliminary draft of the FIRM shows it is very similar to the current floodplain, only slightly more extensive along Hwy. 14, and most likely within the 300ft. wetland buffer. It was explained that the FIRMs are not field based but created using maps, which makes them rather general and 'murky,' according to the consultant

team. The WIDNR wetland maps on the other hand are field based, more rigorous, and carry stronger regulations.
Sanitary Sewer Service – confirming that service is not a constraint to neighborhood land-use planning at this time.
Analysis of Ecological Survey Results – The updated Field Collected Data Map was handed-out and changes to it were reviewed. It was noted that the DNR agrees with this map. The Stream in Johnson Park was determined to be a non-navigable drainageway. The Swale in the north east corner of the study area (on the T.Wall Property) was also determined to be a non-navigable drainageway. There is no regulatory constraint on non-navigable drainageways (the distinction between non-navigable drainageways, intermittent streams, perennial streams, and navigable waterways has to do with who originally mapped it – only non-navigable drainageways have no associated regulatory constraint). A question was raised about how the South Branch of Swan Creek seems to be represented on the map twice (solid red and dotted blue). The dotted blue line is the original USGS data, which is now out-dated; the red line accurately represents the route of the stream. The distinction between high, moderate, and low restoration potential was also questioned. The restoration potential depends on the number of trees present, so a tree stand can be restorable even with very high amounts of invasive species present. The issue of making a connection between Johnson Park and the tree stand immediately to its south was raised and the consultants will advise on how this should be accomplished. Randy Christianson indicated his preference for putting Nobel through the area between the tree stand and Johnson Park. The consultants indicated that development in close proximity to woodlands is not problematic, unlike with wetlands. It was noted that the Steering Committee needs to know the protection standard for tree stands.

Resource Issues to Conclude as part of growth model review include: open space reservations, buffer distances and uses within buffer areas, and tree and woodland protection standards. The consultants stated that they would introduce draft language in future meetings on use standards for reserved areas and other environmental features, including buffers and tree stand protections standards. Jay Allen requested a chart be developed with specific limits for important pollutants such as phosphorous. A map showing the prime agricultural soils and infiltration was displayed, and it was noted that this area, for the most part, has good quality agricultural soils.

Upcoming Resource Studies – the consultants outlined what the next steps are: continuing review of off-site monitoring, confirmation and agreement on study area goals, field soils investigations, field drainage survey, conceptual stormwater management analysis, and performance standards and development design recommendations. The consultant team will be evaluating the feasibility of established environmental goals.

5. Urban service and community facility service areas boundaries – there was a very brief discussion of the alternatives for sanitary sewer availability. It was noted that there likely is sufficient capacity in the Woods Hollow interceptor for the Phase II expansion of the Business Park; this is according to both an outside engineer (Calkins Engineering working for Avante Properties) as well as the City engineer. The issue becomes the

amount of the Bowman lands that can be serviced by the Woods Hollow interceptor, the related phasing issue, and the issue of transferring lands between interceptor service areas.

6. Discussion of potential plan recommendations – Jay Allen distributed and explained a document with two "issues that should be addressed by the plan in the form of recommendations to the City regarding existing policies." The first is the City's parkland dedications standards, and the second is the parking standard and how the City might facilitate the development of structured parking. Steve Arnold stated the need for better citizen representation from the Parks Commission, and suggested requesting a new nomination. The question was raised about the 'fee in lieu of' provision in the parkland dedication ordinance, and whether a state level decision would disallow that provision. The discussion evolved around what form a recommendation to the City might take, and what type of alternatives might be offered in such a recommendation. Alternatives mentioned included decoupling parkland from dwelling units, enabling a broader range of things to be included in the 2900 sq. ft. such as green roof tops and some environmental buffers. The 2900 sq. ft. per dwelling unit standard was discussed, with some committee members suggesting that number is too high, but with at least two members dissenting (Cheney and Weidemann). Weidemann stressed the importance of retaining the ¼ mile provision for neighborhood parks. Arnold suggested adding an agenda item to a future meeting to brainstorm alternatives, as well as perhaps adding a meeting or having a joint meeting with the Parks Commission. It was also suggested that we enlist Teska to develop some proposals, and maybe try to get this issue addressed in the potential zoning code rewrite.

   The parking issue was discussed briefly, including suggestions that the City might build and own structured parking, that this might be done through TIF, but that it might be best to leave the financing out of any recommendation to the City. Changing (lowering) the parking requirement was also discussed, including changing the minimum 1 spot per 300 sq. ft. to a maximum.

   Next meeting was noted as October 2nd, followed by a Plan Commission meeting on October 7th at which NMP will be on the Agenda.

7. Adjournment – Motion by Arnold, second by Christianson was carried at 6:00 pm.

Minutes
North McGaw Neighborhood Plan Steering Committee
October 2, 2008

North McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Joe Rueden, Stewart Brown (for Brian Pleva), Paul Gramann, Kris Wetzel.

North McGaw Park Steering Committee Members Absent: Steve Arnold, Dennis Weidemann
Others Present: Matt Steigman – Project Planner

1. Meeting was called to order at 4:05 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Gramann to approve Minutes of 9/18/08 was carried.

3. Public comment -
   Nancy Halford (of 2621 Tarpleywick Drive, where Land Uses #15, 17, and 18 meet on the Growth Model) expressed her desire for buffers or transitions between land uses, as well as her concerns regarding crossing Syene Road to get to the Transit Stop and the overall impact this plan will have on the current residential character of the area. Ald. Allen and Scott Goldstein (of Teska Associates) responded by saying that these concerns have been and will continue to be taken into account by including in the Plan a pedestrian bridge from the Transit Stop over Syene Road, as well as planning for residential densities to increase only gradually from relatively low densities near the existing lower density Tarpleywick Hills area toward higher densities further north in the Transit Oriented Design area. They stressed that residential density requirements are an average for the area, such that a density gradient would be permissible.

   Questions were also raised by Randy Christianson and others about the way the Steering Committee makes formal decisions, and requested that votes be made more formal such that it is absolutely clear when a decision is made. In particular, the question was raised about whether the Committee really agreed to adhere to LEED-ND standards, and if the Growth Model was really agreed upon. The discussion evolved around the extent to which costs have been taken into account in this process, and if any economic viability studies are being conducted by the consultant team. Scott Goldstein responded by saying that an Economic and Fiscal Impact analysis was underway. Carl Ruedebusch, hearing that decisions were made without committee members being fully aware of what they were agreeing to, cautioned the committee to move slowly and avoid creating a 'monster' with which the City would then be stuck with.

   The presentation described below will be added to the Teska website:
   http://www.teskaassociates.com/fitchburg/documents.htm

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

4. Land Use Part 2
   Scott Goldstein of Teska Associates briefly reviewed where the process currently is within the established timeline and what work has been done to date. He again stated that while working toward a site design, a certain level of specificity was required in the Growth Model to proceed with the technical analyses now underway. Scott then introduced Michael May to present the Transportation Element and said that the Land Use presentation would follow.

5. Transportation Analysis, Michael May – Traffic Analysis & Design (TAD)
   Michael began by saying that his work is preliminary and conceptual. He reported the following data has been collected: traffic counts, roadway layouts, draft Fitchburg bicycle/ped plan elements, and existing transit routing. Work has begun on: conceptual transit routing through the neighborhood, conceptual routing of multi-use paths, conceptual roadway cross sections, estimating neighborhood trip generation. A map with WisDOT daily traffic counts as well as TAD counts was displayed. Michael said that about 50% of traffic is from Madison, 30% from the south, and 15% from the west. He reported more recent data may be available than the WisDOT counts and that this data will be incorporated into the analysis. He said data he collects will be provided to the Metropolitan Planning Organization (Transportation Planning Board) and that they will work together to discern roadway requirements. A proposed bus route was displayed, and discussion evolved around how the cost to the City is calculated by time, not mileage, how the route would impact Green Tech Village (GTV), and how another option might be to have two routes coming down both US14 (the Lacy interchange) and Fish Hatchery and do smaller loops through the neighborhood. A map of potential Multi-Use Paths was displayed, and discussion proceeded around the need to make some connections south through Moraine Edge Park, and connect in the north-east corner heading north. Multi-use Paths are typically 8-10 feet wide and allow both walking and biking. Michael stated that the Growth Model would need to be 'finalized' to provide to the MPO so they can rule on what roadways are required.
   The Steering Committee was then shown four different anticipated road cross-sections for four-lane and two-lane divided boulevards (including space for rain gardens/storm water infiltration), as well as smaller roads with 95 ft and 65 ft ROWs. Discussion evolved around how to balance the desire to attract traffic to Nobel so as not to exacerbate traffic problems on Lacy, without turning Nobel into a highway. Methods for fitting on street parking into the current ROWs proposed for Nobel were also discussed, and the cross-sections will be updated to reflect that desire. For the smaller ROWs, the competing pressures to keep the road wide enough for adequate snow removal was weighed against the desire to keep ROWs smaller for increased density. It was resolved to add some flexibility to the pavement widths (28-32 ft in low density areas and 32-36 ft. in higher density areas). Three alternatives for the Lacy/Nobel intersection were discussed, and it was generally agreed upon that alternative A was the best option and alternative B the worst. Cheney proposed using the existing Blaney Road for a section of Nobel, and that was taken into consideration by Michael May.

The assumptions used to calculate the trip-generation at full build-out were then outlined; a discussion evolved around how transportation modeling is done, and what kinds of expectations the Committee wants to set with these assumptions. It was explained that transportation modeling is based on housing types, not density, so specifying ownership versus rental is necessary. The committee requested that even though the assumptions are necessary, that the plan should not specify how it expects the residential units to break down into rental or privately owned units. It was further explained that the number of parking spaces in the Transit Station was based on area rather than a structured facility because this establishes a good starting point and assures that structured parking is not required here. The 390 spaces that can fit in a surface parking lot are sufficient for the facility, but this is not an indication that the plan will require surface parking. The full build-out trip generation table was displayed at this point, including weekday daily total trips for each major land use and rush-hour peak trips broken down into in/out for each major land use. Concluding the Transportation Element presentation the next steps were outlined: prepare Traffic Impact Analysis (TIA) with Steering Committee comments, obtain WisDOT comments on Lacy/Nobel alternatives, meet with MPO and City regarding traffic assignments and receive traffic forecasts, gain input from Madison Metro regarding transit routing, conduct TIA and provide recommendations, and finally write transportation element of the plan. Committee members where encouraged to submit comments on the Traffic Element by 10/9/08.

Agenda Item 4 continued -

Scott Goldstein outlined the remaining land use issues: land use types (purpose and intent, uses, density, form), parks and open space, environmental sensitive areas, Nobel drive extension, buffers, LEED, and phasing. The Growth Model's R1, R2, Mixed Use, and TOD land use designations were described and example images were displayed. Scott made the point that these density levels, and 18 du/ac in the TOD in particular, are on the low end of being able to really support mass transit; a successful TOD typically has 24-30 du/ac and 2-3 story buildings. Regarding Mixed Use, Scott reiterated that not every building is required to have multiple uses, but that the zoning in these areas might be more form based to achieve a level of coherence. Regarding the environmentally sensitive areas, the committee was alerted that it will have to be determined, probably in conjunction with other governing bodies, what improvements will be allowed within the 300ft buffers. The phasing was discussed and Committee members were encouraged to read the three phasing maps in conjunction with the Build-Out Analysis because the build-out of some areas spans phases, which the map does not indicate. The idea of phasing the construction of Nobel was also discussed, including the possibility of delaying the section between the round-about and Syene Road. Committee members where encouraged to submit comments on the Phasing Element by 10/9/08.

6. Such other matters as may come before the Committee -

Ald. Jay Allen distributed a memo, addressed to seven relevant City boards and committees and signed by the NMP Steering Committee, which outlined four major concerns of the Committee that fall outside its purview. Those concerns include the City's parkland dedication standard, the potential for a Municipal Parking Utility, the current parking requirement ordinance, and the current zoning code. The letter also extended an

invitation to the Park Commission, and members of any other committees, to join the NMP Steering Committee at its meeting on October 16th, 2008. This letter was approved to be sent with minor amendments. The committee also decided to extend an invitation to CEDA and the Finance Committee for the October 30th, 2008 meeting. Discussion evolved around the purpose of these joint meetings, and if they might delay the process. It was determined that the purpose was simply to instigate action that may be required to make the MNP Plan a reality, but that the plan itself was not dependant on said action. The Committee also decided on one specific question for the Parks Commission: what is the difference between the 75 ft. and the 300 ft. environmental buffer and what uses are acceptable within the 300 ft. buffer?

Patrick Cheney requested that the Committee be notified by City staff of meetings relevant to the NMPNP, and that the contact information for City staff be included in the Minutes. Matt Steigman grumbled inaudibly. Cheney also announced a meeting regarding the Lacy Interchange held on 10/8/08.

Next meeting was noted as October 16th, 2008. It was also noted that comments were to be sent to Matt Steigman within a week regarding the Transportation and Phasing Elements.

7. Adjournment – Motion by Gramann, second by Christianson was carried at 6:10 p.m.

Minutes were taken by:
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Minutes
North McGaw Neighborhood Plan Steering Committee
October 16, 2008

North McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Joe Rueden, Kris Wetzel, Steve Arnold, Dennis Weidemann.

North McGaw Park Steering Committee Members Absent: Paul Gramann, Stewart Brown (for Brian Pleva)

Park Commission Members Present: Bill Horns, Becky Zuba, Tom Darcy, Scott Endl – Director of Parks and Recreation

Others Present: Dan Hardy - CEDA, Mike Zimmerman – Economic Development Director, Matt Steigman – Project Planner

1. Meeting was called to order at 4:07 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Rueden to approve Minutes of 10/02/08 was carried.

3. Public comment - None

   A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

4. Historic Sites – Rueden Property
   It was noted that the only historic preservation issue within the study area is on the Rueden property at 5329 Lacy Road. Joe Rueden explained that the house was originally built in the 1880s. It burned down and was rebuilt around 1900. Rueden renovated the house and a panel from the City and University subsequently recommended it be designated a City Landmark. The barn on the property was assigned an optional City Landmark status. To remove the Rueden building and replace it with Mixed Use, in accordance with the Growth Model, the issue would have to come to a vote before the Landmarks Commission after the requisite public hearings. Arnold requested the site be added to the Opportunity and Constraints Map.

5. Transportation Element Discussion
   Steigman briefly reviewed the City's preferred alternative for the Nobel/Lacy intersection, which was labeled Alternative A in the 10/2/08 presentation. A revised version of Alternative C, also from the 10/2/08 presentation, was distributed for the Committee's consideration. The revisions add a traffic circle where Nobel and Lacy intersect, as well as a designated lane to by-pass the traffic circle for traffic traveling north on Nobel to the

Lacy interchange. It was noted that traffic forecasts for Lacy increase only slightly with the interchange. Christianson noted that at the Lacy Interchange Public Information Meeting on October 8th, 2008 there were many expressions of concern regarding traffic on Lacy Road. He suggested that those concerns should propel the Steering Committee to reconsider moving Nobel north, to run along the southern edge of McGaw Park. Christianson further suggested that the current alignment might delay the construction of Nobel because it goes right through the Stoneman property, and perhaps even their house, which may not be for sale in the foreseeable future. Weidemann concurred with Christianson. They suggested that the consultants be asked to assess this option. Cheney countered by saying that he likes the current alignment, and suggested that if settled issues can be rehashed, that he has a few of his own. Wetzel said she would like to preserve both the house and the Environmentally Sensitive areas along the southern edge of McGaw Park, and that perhaps language to that effect could be included in the text of the plan. Arnold also reminded the group that in the years between now and the time that construction actually begins, the WisDOT may reconsider their position on the alignment of New Lacy Road and its intersection with Nobel, and that this could change significantly the traffic forecasts for Lacy Road.

6. Phasing Proposal and Build-Out Analysis discussion
   It was noted that parcels numbered 20 and 21 will be added to phase one, and that the change will be reflected in the build-out analysis. It was further noted that the acreage numbers on the October 14th version of the Growth Model are accurate, and that the previous acreage numbers should be ignored. The accurate total for acres in the study area is 712.

7. Parkland Dedication Standard – with Parks Commission
   Chairperson Allen briefly reviewed the Opportunities and Constraints Map and outlined the major Parks and Open (PO) Space issue. The City policy for new land in the USA is for a 300 foot buffer, where in the past the City had followed the DNR standard of 75 Feet. The question the NMP Steering Committee put to the Parks Commission was what uses, if any, could go in the additional 225 feet (which amounts to almost 32 acres in the study area), assuming there is no change in policy regarding the first 75 feet.
   The questions provided to the Parks Commission in a handout were as follows:
   1. Should larger wetland open space be counted as parkland dedication?
   2. What uses might be permitted within that space?
   3. Should the neighborhood park standards be customized to different types of neighborhoods?
   4. How should parkland dedication be calculated for mixed-use districts?
   5. Should the amount of parkland dedication be changed?
   6. Should the fee in lieu of dedication be changed in light of the above?

   Discussion evolved around:
   How does Moraine Edge Park get calculated into PO?
   It was agreed upon that we are moving forward with NMP plan with the current PO ratio, and that the above questions represent more long-term issues for the Parks Commission to

explore. The most immediate question for the Parks Commission to consider is the additional 225 feet of wetland buffer.
Tom Darcy (Parks Commission) wanted clarification of what was being asked of the Park Commission: a new policy, an exception to the existing policy, or how to fit NMP into existing policy? Allen explained that the Parks Commission can proceed however it feels is best. Darcy explained that the Parks Commission has in recent years been doing very little 'fee in lieu of' because they don't feel this option provides as much in return as does the dedication. Darcy went on to say that transit oriented development is obviously something they are going to be seeing more of as time goes on, and that they will need a way of addressing the issue of higher density areas. It is better, as a matter of course, to include the Parks Commission earlier rather than later so that their input can really be factored into the plan. Darcy said the Parks Commission can recognize the new development category that NMP, NEN, and GTV all represent, but they also have a responsibility to ensure adequate recreation space, and try to balance the new pressures with their responsibility to tax payers and the understanding that not all future development will necessarily be transit oriented – so therefore they must maintain a level of flexibility in their approach to providing adequate parkland.

The conversation turned more specifically to the matter at hand, and it was asked how much PO is in the plan already. How close is the current GM to meeting the PO requirements?
City staff said they would get this information to the Parks Commission.
Becky Zuba (Parks Commission) said that they really need to know more about the specific plans, and how the layout will be, to make specific determinations about the Plan, as they typically review plans at a somewhat later stage. Zuba also requested some recommendations on how they might address these issues. Steve Arnold envisions much smaller neighborhood parks - .5 acre, or plazas. The Parks Commission asked for information on what is typically required, in terms of parkland, for a TOD area. What has worked and what has not? Questions were also raised about what uses can go into the Environmentally Sensitive areas, and what the difference is between woodland and wetland ES areas in regards to uses? It was stated that for developers, the 225 foot additional buffer may be more significant even than the park dedication in terms of the amount of land they have to work with. It was also suggested that the developers might be better able to meet the .5 FAR standard if they can phase-in the higher density, with additional buildings going into parking lots or even adding floors to buildings down the road. It was also stated that maintenance should be taken into consideration with the park ordinance.

It became apparent that with the current parkland ordinance, the 'fee in lieu of' would have to be more widely utilized to accomplish the higher FAR and dwelling units per acre required in NMP. It was stated that the fee is not guided to specific uses or types of parks, rather the Parks Commission just applies common sense. The Parks Commission said the 'fee' has failed to keep up with the price of land, which accounts for why they are somewhat reluctant to use it. Arnold suggested having the developers procure the required acreage rather than pay the 'fee in lieu of'. Allen said the parks fund is almost empty, which is another reason some of these issues need to be addressed. Another issue is that

the current PO policy does not require any park space for workers. There is no PO requirement for offices.

8. Such other matters as may come before the Committee - none

9. Adjournment – Motion by Arnold, second by Rueden was carried at 5:57 p.m.

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Minutes
North McGaw Neighborhood Plan Steering Committee
October 30, 2008

North McGaw Park Steering Committee Members Present: Jay Allen (Finance Committee Member, Plan Commission Member), Patrick Cheney, Randy Christianson, Sam Cooke (for Joe Rueden), Kris Wetzel, Steve Arnold (Transportation and Transit Commission Member), Stewart Brown (CEDA Member, attending for Brian Pleva).

North McGaw Park Steering Committee Members Absent: Paul Gramann, Dennis Weidemann.

Invited Guests Present: Ed Kinney (Plan Commission), CEDA Members: Chris Armstrong, Randy Hackbarth, Dan Hardy, Alderperson Jason Williams.

Others Present: Mike Zimmerman – Economic Development Director, Duane F. Bowman – Vice President and CEF of Bowman Farms Inc., Sean Robbins – Vice President of Development at T. Wall Properties, David Schreiber – Principal at Schreiber/Anderson Associates Inc., Matt Steigman – Project Planner.

1. Meeting was called to order at 4:06 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 10/16/08 was carried.

3. Public comment – Duane Bowman read the following statement:

   > As to the "questions" raised by Member Randy Christianson at the meeting of this Committee on October 2, 2008, item 3 of the minutes, we support his concern as to the clearness and intent of formal decisions made by this Committee to avoid creating a "monster" which the City and the contributing members and other non-contributing members of this neighborhood plan would be "stuck with" as to the marketability of the properties in the neighborhood. Thank you for this opportunity to speak.

   A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

4. Discuss language for defining MU/TOD
   Chairperson Allen distributed a handout and reviewed the first four pages. This handout will be available here: http://www.city.fitchburg.wi.us/planning_zoning/NorthMcGaw.php
   The pages reviewed at this point worked to help define and specify the basic tenets of a TOD, provided an example from Brunswick, Maine, and outlined the design guidelines of

the Southdale Neighborhood Plan, which call for higher densities than what is being discussed here. Other areas near the beltline and around Dane County planned for development were discussed, and the lessons learned from those experiences were debated. Sean Robbins of T. Wall said he was satisfied that he had the level of specificity necessary to create a CDP for a TOD.

The discussion then turned to the .5 FAR requirement. The question was raised as to what scale the .5 FAR would be calculated – if a particular CDP could be lower, assuming another one would make up the difference. Allen suggested that each new USA expansion should have an FAR of .5. Chris Armstrong said the .5 FAR is difficult because of parking. Arnold suggested that expensive parking can be an incentive to reduce the need. Allen added that parking spot requirements tend to be more precise with more expensive structured parking. Armstrong countered that the actual calculations made by tenants propel them to fit more employees into less office space, so they can meet parking requirements at a lower cost. Sean Robbins took a seat at the table, warning the Committee they might regret offering him said seat, and argued that phasing density in over time is the best way to achieve the goal of .5 FAR. He argued that the transit is a prerequisite for the higher density and that the density could increase as the rail comes on-line. Robbins also offered an example of where this is happening in Middleton, and highlighted the essential role of public support in that case. Allen said that the City had decided what it wanted to do, and now the question was 'what does the City have to do to make it happen?' Robbins said that developing this neighborhood would be more difficult because other areas near by would not have this .5 FAR requirement. Allen disagreed with that assessment, citing in particular the even higher FAR requirement in GTV. Armstrong made the point that the GTV requirement Allen cited was at full build-out, but that the initial phasing of the plan could have lower FARs. This disagreement remained unresolved. Arnold agreed with Robbins that it's the transit that activates a TOD. He suggested that transit is a very effective way of directing development, that transit should direct development, and that development in the TOD should wait for the rail line so that we get the agreed upon densities. Arnold went on to say that developing 3 or 4 neighborhoods simultaneously is too expensive for the city anyway, considering all the infrastructure expenses, and that McGaw is at the bottom of the queue so this is another reason it should wait.

Randy Christianson asked when the rail will happen. Arnold and Allen said there are not firm dates yet, but that the idea is to have the Fitchburg line begin at the same time as Madison's east-west line, about 2015.

5. Transportation Element Update –

   A series of maps and the trip generation tables were distributed at this time. Most of these documents were presented to the Plan Commission by Teska on October 21, 2008. That presentation can be found on the Teska website:
   http://www.teskaassociates.com/fitchburg/Docs/presentations/Fitchburg%20presentation%2010-20-08%20v%202.pdf

   Randy Christianson asked about the width of Parcel 24 on the Growth Model, particularly why the areas to the west of the existing McGaw Park are so wide. Allen said they probably don't need to be that wide and that we would remind the consultant team to edit the parcel in question.

6. Discuss Parking Issues with invited Committees (5 PM) –
At this point the meeting returned to the handout referred to in Agenda Item Four of these Minutes. The experience of Brunswick, Maine was discussed in more detail, and questions were raised about the particulars of the financing and costs. The design guidelines for the Southdale neighborhood were reviewed, and it was pointed out in particular that this area has a .15 open space ratio, providing evidence that .85 ISR might be possible. It was noted that each zoning classification has its own maximum ISR. Chris Armstrong then walked us through the example site plan for the Fitchburg Technology Campus, produced to explore the implications of the .5 FAR. This plan was originally presented at a CEDA meeting on October 23rd. The formula used to calculate FAR for the lots in the plan subtract out 20% of the area in each lot, an assumption based on the current maximum ISR in Fitchburg of 65%, which may need to be raised to 80% for this example. The example site plan includes underground parking in seven buildings, plus a 520 spot, four story parking ramp. Combined, the plan estimates the City would need to provide at least $10 million. The parking ramp would be necessary under the current parking requirements, as the plan, without the ramp, is 500 spots short, even with the parking underneath the multistory office buildings. The buildings are based on what is understood to fill current demand; specifically, 'slab on grade,' one story buildings are desired by nano-tech and light manufacturing companies for various reasons. Given the structured parking and the formula used to calculate FAR, all the lots in the example site plan meet the .5 FAR standard. Dave Schreiber stated that T. Wall also had an example CDP, but that they would like clear goals to work within when making such plans. Discussion then evolved around how the city will go about providing help with the parking, what the process is, and what are the likely avenues. The funding options discussed include Tax Increment Development, Bonds, and City owned municipal parking leased to businesses or individuals. Armstrong stated that at the end of the day, tenants will know that they are paying a premium for structured parking. The counter argument was made that the higher densities will make this area more desirable, but only in the long-run. The discussion then reverted back to phasing, and the issue of how density can be guaranteed over a long period of time. Form based codes were discussed as an alternative to land-use based planning, which characterize current City zoning codes.

Sam Cooke requested some clarification on what the McGaw Park Neighborhood Steering Committee was asking the invited committees to do. Allen stated that the purpose here was simply to notify relevant committees of contradictions between goals of the city (or at least of the Steering Committee) and some existing policies and codes. Allen stated that the NMP Steering Committee is not expecting answers, but wanted to highlight the issues that have emerged in the NMP planning process such that when developers bring plans to the City in the future the various committees are not surprised, but rather are prepared to handle the issues discussed and the questions posed in this meeting. Those questions are included in the handout referred to above, and follow here:

Questions for Plan Commission:
1. What changes need to be made to current zoning code to accommodate TOD and other mixed use development?
2. Would a form based zoning code be more appropriate for these uses?

3. How should parkland dedication be calculated for mixed-use districts?
4. What are acceptable land uses within environmental buffer areas?
(What is ISR for residential land use?)

Questions for CEDA:
1. What is the role of CEDA in attracting users to more intense development?
2. What incentive programs should be developed to encourage mixed use development?
3. How will the City coordinate our economic development with other areas of the County to maximize transit efficiencies?

Questions for the Transportation and Transit Commission:
1. How do we coordinate the City's potential rail line with other transit in the County?
2. What should the City's role be in creating a Regional Transit Authority?
3. If a parking utility is created by the City, how should it fit within the City's organization?
4. What is the best way to achieve the transit goals of the Neighborhood Plan?
(Do existing parking requirements need to be adjusted?)

Questions for the Finance Committee:
1. Within the framework of a parking utility, how does the City maximize options and flexibility without putting the taxpayers at risk?
2. Do the City's current TIF policies serve the needs of the City as our development style has evolved?
3. What incentives, if any, is the City willing to provide to developers who wish to create better development for the City?

7. Such other matters as may come before the Committee - none

8. Adjournment – Motion by Arnold, second by Wetzel was carried at 6:10 p.m.

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Minutes
McGaw Park Neighborhood Plan Steering Committee
January 15, 2009

McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Joe Rueden, Kris Wetzel, Steve Arnold, Brian Pleva, Paul Gramann, Dennis Weidemann.

McGaw Park Steering Committee Members Absent: none

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

1. Meeting was called to order at 4:03 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 10/30/08 was carried. Cheney requested that in the future all acronyms in the Minutes be spelled out.

3. Public comment – none

4. Components of Plan – Consultant Team

The slides of the presentation given for this agenda item can be found here: http://www.teskaassociates.com/fitchburg/documents.htm (Dated January 15, 2009 under 'Presentations'). The Plan itself is (as of 2/13/09) labeled 'McGaw Park Neighborhood Plan – February DRAFT' under 'General Documents.' The order of Agenda Item Four was changed from the original Meeting Notice. Transportation was moved to the end, and Economic and Fiscal Analysis was removed.

Sanitary, Water and Other Infrastructure (Stormwater Management):
Steve Gaffield (of Montgomery Associates-Resource Solutions) provided a brief introduction to the plan. Jay Allen added to a review of the plan's schedule that the Common Council, on January 27th, will refer the plan out to relevant committees, which should review the plan and provide comments in a timeframe such that the Steering Committee can review those comments by the March 3rd Steering Committee Meeting. Tom German (of Natural Resources Consulting) then presented information regarding soil infiltration garnered from digging seven soil pits around the study area. While this is only a preliminary evaluation (additional pre-construction, site-specific study is required) the findings were reported as positive and looking favorable for natural stormwater infiltration. Steve Gaffield (of Montgomery Associates-Resource Solutions) then discussed impervious surface ratios, pointing out the benefits of ratios that are lower than conventional suburban neighborhoods while still maintaining higher density levels. (The slides differentiate between 'conventional' and 'conservation', characteristics of conservation design are

compact design with taller buildings, narrower streets, and underground parking). Chris Armstrong stated that higher allowable impervious surface ratios make higher floor area ratios possible. The difference between recharge and infiltration was covered, and the Committee was educated on the contexts in which various stormwater management techniques are most suitably employed. Swan Creek for example, is considered sensitive so both groundwater and runoff should be safeguarded. Techniques mentioned include putting some detention facilities in the wetland buffer and using pervious pavers. More specific stormwater management recommendations were then provided:

- Peak Discharge: Maintain peak discharge rates such that the post-development peak runoff rate does not exceed the pre-development peak runoff rate for the 2-, 10-, and 100-yr 24-hour design storm events;
- Water Quality: Reduce the Total Suspended Solids (TSS) load by 80%, based on an average annual rainfall, as compared to no controls, and treat the first 0.5-inches of runoff for oil and grease using the best removal technology available;
- Infiltration (stay-on): For all land use types, the post-development annual infiltration volume is at least 90% of the pre-development annual infiltration volume.
- Recharge: For all land use types, the pre-development recharge volume of 7.6 inches/year shall be maintained under post-development conditions.
- Resource Consideration: Evaluate the performance of the Neighborhood stormwater management system in a watershed context.

The Stormwater Management Plan can be found on page 5-13 of the Draft Plan.

Water Supply:
The Water Supply Plan is still being developed and the discussion here was brief. It was stated that the goal of being water neutral (replacing everything the neighborhood pumps) will be difficult with the recommendations contained in the plan.

<u>Environmental, Open Space and Recreation:</u>
Tom German (of Natural Resources Consulting) explained the value of environmental corridors and offered a wetland categorization requiring three progressively smaller environmental corridors, including what potential uses might go into each. Steve Arnold suggested the current method of categorization would make it difficult to decide what category a particular wetland would fall into. It was decided that while this would not be an issue in the McGaw Park study area, this should be revisited for any city wide consideration. A discussion followed about what uses would be appropriate in the corridors, and Jay Allen suggested that it would be appropriate to include Steering Committee recommendations of this type in an appendix. For example, suggesting a pervious bike/pedestrian path can go within the 300 ft. environmental corridor.

<u>Woodland, herbaceous plants, natural resources:</u>
Recommendations were provided for environmental corridor restoration, and are available in detail in Chapter 7 of the Draft Plan.

Staging and Timing and Transition Plan:
After a very brief review of the Land Use Plan and a brief look at the 'Conceptual Plan for a Transit Center within Area 12' (Figure 8.3) in the Draft Plan, we turned our attention to the Implementation Plan. Several corrections and improvements to these maps were noted. One question that requires some consideration was how the McGaw Park extension can move forward in phase one when that land needs to be dedicated from parcels scheduled for development in phase two? Another issue raised was the width of the park and open space connection north of parcel 22 (south of the Reuden property).

Transportation (Draft Plan Chapter 9):
Michael May (of Traffic Analysis & Design) began by explaining that the Traffic Impact Analysis is very detailed and specific, while the Transportation element of the plan addresses the more global scale and that this is the focus of his presentation. The intersections that were studied were displayed, and the classifications for the streets in the study area were discussed. Michael pointed out that there are Major Arterials (like USH 14) and Minor Arterials (like Lacy Road). He reviewed transportation projects already planned in the City including widening of Fish Hatchery, the USH 14 interchange, northward extensions of Fahey Glen and Notre Dame, and improvements to Lacy Road – which are incorrectly stated in the Draft Plan – and will include bike lanes and sidewalk but not turning lanes. Michael then explained the traffic models he used in his analysis, including the difference between 'background' traffic, which assumes McGaw is not built, and 'build' traffic which includes traffic generated by McGaw Park Neighborhood. The Committee was told to keep in mind that the Trip Generation table in the Draft Plan does not include reductions that come from linked trips, or trips within the study area. This is particularly important in a mixed-use neighborhood designed with the particular goal of increasing linked trips. A set of assumptions were provided that yield a reduction of roughly 25%. Improvements to existing roads called for in the Plan were reviewed, including the USH 14 interchange road, Cheryl Parkway, Fish Hatchery, Syene, and Lacy. Again, improvements to Lacy will include some turning lanes, but widening the length of it is not called for here. The proposed cross-sections were discussed, highlighting the finding that Nobel will only need to be two lanes, not four, and that the length of it will be access controlled and include on street parking. It was noted that the 100' right-of-way will be grated toward the center. It was indicated that the alley right-of-way will likely be grated toward the center and have a drainage mechanism there. The intersection of Syene and Nobel was discussed next, and Michael said they had a workable solution with a 65 degree angle and a stop light, that cuts into the 300' environmental corridor east of Syene but not the 75' corridor. This intersection again spurred some discussion, especially of the future of the Hartung Seed Processing site and the actual viability of getting a road through this area. Jay Allen said Hartung's extended use permit was recently approved by the Common Council. Pleva requested the Council refer the Plan to Community and Economic Development Authority. Christianson requested the Plan be evaluated in terms of how many Leadership in Energy and Environmental Design – for Neighborhood Development (LEED-ND) points it would garner.

Michael May recommended a four-leg intersection with roundabout for the intersection at Lacy/Nobel/Interchange Road and said it could be placed to minimize the impact on the

wetland to the north. He also recommended phasing in Nobel so that the section between Fahey Glen and Syene will be developed last. Michael also recommended putting Syene 25-feet from the rail at both Nobel and Lacy. The reason for this was to minimize preemption costs – preemption is a system in which the traffic signals ensure the intersections have cleared before the train comes through. It was noted that school buses, typically longer than 25-feet, would not fit and could cause a problem. The map of multi-use trails was displayed, and while they provide excellent coverage throughout the area, some concerns were raised about maintenance costs. A Transit Routing map was displayed, but it was noted that this would change dramatically if a new transfer point for Madison Metro was placed in Green Tech Village. The new Smart Location prerequisite for LEED-ND was described as requiring buses running every 15 minutes all day, and while this is a considerable hurdle a transit plan for meeting that requirement was offered. Additionally, plans to fulfill the LEED-ND walkable streets prerequisite and the connected/open community prerequisite were presented. Michael said he would include a cross-section of the 20-foot alley to the plan.

5. Such other matters as may come before the Committee –
   Jay Allen suggested one additional Steering Committee meeting might be required on March 17th for a final review of the Plan.

6. Adjournment – Motion by Rueden, second by Wetzel was carried at 6:17 p.m.

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Minutes
McGaw Park Neighborhood Plan Steering Committee
February 19, 2009

McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Joe Rueden, Kris Wetzel, Steve Arnold, Brian Pleva, and Robert Zorko (for Dennis Weidemann).

McGaw Park Steering Committee Members Absent: Paul Gramann.

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

1. Meeting was called to order at 4:04 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 01/15/09 was carried.

3. Public comment – none

4. Updates/edits to the Plan – Consultant Team

   At this point some documents were distributed: A draft Appendix from Jay Allen, a point by point LEED-ND analysis, comments submitted by Dennis Weidemann, an updated meeting and adoption schedule, and the Minutes from the January 26th Neighborhood Summit.

   It was decided that the next Steering Committee meeting will be March 5th (it had previously been scheduled for March 3rd) and an additional Steering Committee meeting was scheduled for March 17th. The presentation to the Plan Commission originally scheduled for March 3rd was cancelled, but the March 17th presentation to the Plan Commission was confirmed.

5. Components of Plan – Consultant Team

The slides of the presentation given for this agenda item can be found here: http://www.teskaassociates.com/fitchburg/documents.htm (Dated February 19th, 2009 under 'Presentations'). The Plan itself is (as of 2/25/09) labeled 'McGaw Park Neighborhood Plan – February DRAFT' under 'General Documents.'

Stormwater:
Ben Carlisle (of Teska Associates) provided a brief introduction and then handed it off to Steve Gaffield (of Montgomery Associates-Resource Solutions) to present on how the Plan deals with Stormwater management. Allen mentioned at the outset that a phosphorous standard had been discussed and that it was being developed. Arnold asked about a nitrogen standard, but Gaffield said that a nitrogen standard could not be created scientifically.

Gaffield then explained the most important stormwater terminology, and explained that stormwater is addressed both in terms of infiltration and groundwater recharge. Impervious surface ratios were explained, and Gaffield pointed out the benefits of ratios that are lower than conventional suburban neighborhoods while still maintaining higher density levels. (The slides differentiate between 'conventional' and 'conservation', characteristics of conservation design are compact design with taller buildings, narrower streets, and underground parking). The difference between the existing stormwater management standard and the MPNP recommendation was described. Under the existing system for residential development, the requirement is to achieve an infiltration rate after development of 90% of pre-development infiltration, but only to the point at which 1% of the lot is being used for infiltration. At that point, the requirement becomes 7.6 inches/year of recharge. For non-residential the numbers are 60% infiltration with a 2% land cap. The MPNP recommendation is to eliminate the cap, and set a requirement for a 90% infiltration rate for both residential and non-residential development. The 7.6 inches/year will still be a requirement, but it is expected that the 90% infiltration rate will always translate into at least 7.6 inches/year. It was also stated that the density requirements in the TOD and the east business park area will necessitate putting some stormwater facilities in the 300 foot wetland buffer, and that nothing in the plan would prohibit that. Gaffield then pointed out some things to consider regarding the new standard, including that flexibility and creativity will be required of both the developers and the City staff to achieve the 90% infiltration rate. Discretion in the review process will be in the Plan. It was also noted that in the high density areas, stormwater infrastructure could occupy a large portion of available landscaped area.
The Stormwater Management Plan can be found on page 5-19 of the Draft Plan.

Fiscal Impact:
Ben Carlisle presented the fiscal impact analysis conducted by Teska. He began with the methodology and assumptions and explained that the numbers used take the current economic downturn into account. It was further explained that when interpreting the results to remember that expenditures only include operating budget costs (police, fire, public works, administration) but not capital improvements like roads or sewer extensions, for this reason the fiscal impact analysis does not show the considerable savings to the City from the higher than usual levels of density. The analysis does show that each phase of development generates a net benefit for the City. The conclusions of the Fiscal Impact Element of the plan were discussed and Rueden suggested that the implications of the levy cap need to be better explained. The Committee also decided to eliminate the sentence in the final paragraph that reads: "residential development typically costs more for the City to service than commercial development." The following sentence will remove the term 'non-residential'.

At this point there was a discussion of appropriate land-uses in the BP, as per Dennis Weidemann's comments. There was an informative discussion of what performance standards are, and how they differ from form-based codes. The City zoning code rewrite, which is scheduled and funded and should be happening over the next 18 months or so, is expected to be form-based and address architectural issues, rather than use-based zoning which is how it has been done in the past. In our Plan performance standards will be added

to control secondary effects such as: noise, lighting, etc... It was decided that this combination is more effective than trying to list appropriate uses. Jay added that the performance standards must be taken into account in the selection as well as the placement of equipment, as per Weidemann's comments.

LEED Certification:
We then moved onto LEED-ND certification, and a preliminary study of how close the MPNP currently is to a form that would meet the standard. The preliminary analysis showed that 40 points was attainable, but that somewhere around 60 should be the goal as we will not be granted every point we seek. Ben walked the Committee through the chart, highlighting points that were not included in the preliminary analysis but that Teska believes to be attainable. Christianson requested that the chart be amended to add a column that would indicate where primary responsibility would fall for each particular item – developers, the City, or the Plan itself. Christianson and Pleva also requested that LEED-ND be discussed in the plan as a goal, but not as a target.

Transportation:
Michael May (of Traffic Analysis & Design) began by explaining the updates to the Transportation Element made in the February 11th draft. Parts of Fahey Glen and Notre Dame were widened to an 80 ft. Right-of-Way (ROW). The name 'New Lacy Road' was changed to 'Interchange Road.' The curve at the south end of Notre Dame was straightened somewhat. Curly Oaks no longer connects to the south to Utility Road, now only a multi-use path will extend the current Curly Oaks south. The road south of Nobel and is currently called Curly Oaks (the name will be changed in the next draft) now connects to Nobel at a more perpendicular angle. Finally, Syene Road south of Nobel has been reduced from a 4 lane recommendation down to two, although in the plan area it is recommended to keep a 4 lane ROW for potential future demand. The proposed cross-sections were discussed, especially the changes from previous versions which were relatively minor with one exception – an additional 80 ft cross-section (Type B) was added and is recommended for Fahey Glen and Notre Dame Drive. There also was a 20 ft. alley-way cross-section added. Looking back at the road layout, Randy Christianson objected to the 80 ft. ROW and alignment for Jones Farm Road, and after some discussion it was decided that the line representing Jones Farm Road would be replaced with an arrow from both directions indicating that a road is required but not recommending any particular alignment. Mike May also indicated that he would be willing to go down to a 66ft ROW. Randy Davis indicated his belief that Fahey Glen and Notre Dame, both at 80 ft, parallel and so close together was overkill. This conversation continued after adjournment and it was decided that while Mike May still believes an 80 ft ROW for Notre Dame is more appropriate, that he would recommend a 66 ft ROW at the unanimous behest of the Steering Committee.

Mike May then presented some notes on the rail crossing at Nobel/Syene and Lacy/Syene. He indicated that the State Rail Coordinator agreed to keeping the rail within 25 feet of Syene if signals are installed, as they will 'exempt' the rail crossings for CDL/bus drivers by State law. Mike also recommends the Lacy/Syene intersection be raised in the future to reduce the slope between the rail and Syene. Road connections south to Irish Lane were also discussed and it was decided that the two eastern most connections to Utility Road

should show arrows going south. This decision was made in reaction to members of the Transportation and Transit Commission who indicated they could not vote to recommend approval of the plan without some connections south shown on the map. Mike May also said he would add shading to the map south of Irish Lane to represent the urban growth boundary.

6. Such other matters as may come before the Committee –
   Allen's proposed appendix was discussed briefly, and Randy noted that his objection to one of the Parks Requirements had already been edited to his satisfaction.

7. Adjournment – Motion by Arnold, second by Cheney was carried at 6:18 p.m.

Minutes were taken by:
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Minutes
McGaw Park Neighborhood Plan Steering Committee
March 5, 2009

McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Joe Rueden, Kris Wetzel, Steve Arnold, Brian Pleva, Dennis Weidemann, Paul Gramann, and Aaron Richardson (Parks Commission representative).

McGaw Park Steering Committee Members Absent: none.

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us
The Plan can be found online here:
http://www.teskaassociates.com/fitchburg/documents.htm
Labeled 'McGaw Park Neighborhood Plan – March DRAFT' under 'General Documents.'

1. Meeting was called to order at 4:02 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 02/19/09 was carried.

3. Public comment –
   Duane F. Bowman, Vice President and CEF of Bowman Farms, Inc. registered requesting additional views. Those comments read:

   > As to the "draft performance standards" provided by Chairman Allen via e-mail on March 2, 2009 and the response(s) to date from C. Armstrong, P. Sveum, S. Robbins, we respectfully request comments from our current Alders of the McGaw Neighborhood, Alder candidates seeking to replace them, current Mayoral candidates and other concerned citizens and others wishing to submit written comments, as done by the aforementioned, for review by the Steering Committee at the March 5, 2009 meeting. If no other written comments are received, let the record so indicate.

   Allen and Arnold were present and made oral comments reflected in the Minutes below. No other comments were received.

4. Updates and house keeping –
   - Additional LEED-ND Analysis – It was reported that an additional $2,625 fee had been provided to Teska for a more detailed LEED-ND analysis. That analysis will include an expansion of a previous version of a spreadsheet analysis which will include specifically what will be required and by whom, for each point. In addition, the conclusions of this analysis will be worked into the text of the Plan. (As of March 12, 2009 this document is included in the appendices, which can be found on-line at the address above)

- 66 foot ROW for Notre Dame – It was made clear that this change had been made and that the Committee was aware of the change and that there were no objections.
- It was also reported that the Resource Conservation Commission gave their unanimous support to the Plan. No other Committee has voted on the Plan.
- Everyone was reminded of the Steering Committee meeting scheduled for March 17th, and the presentation to the Plan Commission later that evening at 7 p.m.

5. Chris Armstrong – Fly-over view of potential development plan
   A two-minute DVD was played twice, showing a 3-D view of the proposed Business Park area in the western portion of the study area, where the Fitchburg Technology Campus Phase II is planned. Chris walked us through the DVD presentation, and a brief discussion ensued regarding public spaces, street width, structured parking, infiltration, and building height. This plan showed buildings of different heights, including some one story buildings. Steve Arnold suggested providing the DVD to FACTv, and Chris said they might do that after making some improvements. The DVD received a round of applause and Chris appeared close to bursting with pride.

6. Continue discussion of Draft Plan
   At this point we called Scott Goldstein of Teska Associates to join us over the phone. We began with two issues raised by the Transportation and Transit Commission. The first regarded staging, and their desire to extend Fahey Glen north to Cheryl when Nobel is first extended to Fahey Glen. The Committee was in agreement that if this indeed would reduce traffic on Mica and Lacy by attracting traffic to Fahey Glen and East Cheryl Parkway, then it was a good idea and text should be added to reflect this. The second comment from TTC regarded phasing. TTC was skeptical that this area could develop as quickly as the plan suggests. We decided to soften the dates on phasing, allowing for the availability of land, within the 75 acres per year City wide development maximum, to determine the pace of development in the McGaw Park Neighborhood.

   We turned next to how the plan should describe the Mixed-Use areas. The following change to the text was agreed upon. The original text read: 'The 57-acre mixed-use area should contain approximately 50% office and 50% residential uses.' The new text reads: 'The 57-acre mixed-use area should balance employment and residential uses.'

   Regarding the new section of road labeled Curly Oaks, Pat Cheney's suggestion was accepted that it be named Muriel Lane.

   Mike Zimmerman's concern about ambiguity in the plan as to who will be responsible for restoration and enhancements in the environmentally sensitive areas was discussed. It was decided that this issue cannot be resolved in a neighborhood plan and would need to be addressed through other mechanisms.

   We then turned to the issue of how to describe the business park, in terms of what uses would be allowed in that space. It was unanimous that the draft performance standards provided by Chairman Allen via email on March 2, 2009 (and the subject of the public comment above) were unacceptable. Scott Goldstein stated that they had gotten ahead of

themselves and that this plan could not include its own performance standards independent of the City's broader zoning code. Allen provided an alternative document to the performance standards. That alternative was discussed, and it was decided that a slightly revised version of it should replace the original draft performance standards provided by Chairman Allen via email on March 2, 2009. The text of the plan will show the following change regarding the business park. The original text read: 'The park should allow office and light industrial uses.' The new text reads: 'The park should allow office and other commercial land uses within the parameters of the performance standards to be developed.' The gap between the time this plan is adopted and the approval of performance standards in the future was discussed. Dennis Weidemann stated that his neighborhood organization and the developers of the business park, particularly Chris Armstrong of Avante Properties, had a good working relationship which he thought would be sufficient to achieve the goals of the performance standards until such time as they are established.

A comment was discussed that suggested the plan's vision statement was not sufficiently business friendly. After some discussion, Scott Goldstein resolved the issue by adding the words 'economically vibrant.'

We then addressed how the plan calculates FAR. Goldstein stated that they would add this information into the implementation charts and an expanded methodology section. It was established that LEED-ND should consistently be the basis for measurement throughout the Plan, including for calculating FAR.

The mixed use area on Lacy Road (Growth Model area 20) was discussed. In particular, the idea of adding a sentence to page 8-8 discouraging gas and drive-up services in this area was rejected.

The term 'light rail' was discussed, including concern that it might be misinterpreted to mean replacing the existing rail. It was decided that all references to 'light rail' will become 'rail/bus rapid transit'.

Mike Zimmerman's concern was raised, about clarifying the private sector's role in the implementation process, including issues of when CDPs would be solicited or when TIDs would be negotiated. It was stated that this level of detail was inappropriate for the plan.

7. Such other matters as may come before the Committee – none

8. Adjournment – Motion by Arnold, second by Cheney was carried at 6:02 p.m.

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Minutes
McGaw Park Neighborhood Plan Steering Committee
March 17, 2009

McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Kris Wetzel, Steve Arnold, Brian Pleva (on the phone), Dennis Weidemann, Paul Gramann, Scott Endl (Parks Commission representative), and Samuel Cooke (for Joe Rueden).

McGaw Park Steering Committee Members Absent: none.

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us
The Plan can be found online here:
http://www.teskaassociates.com/fitchburg/documents.htm
Labeled 'McGaw Park Neighborhood Plan – March DRAFT' under 'General Documents.'
The LEED-ND Matrix referred to below can also be found at the above link, labeled: McGaw Park Neighborhood Plan Appendices - March DRAFT(6MB). The Matrix begins on page 117.
The slides presented at this meeting can also be found at the above link, under 'Presentations', dated March 17th.

1. Meeting was called to order at 4:07 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 03/05/09.
   - Several minor changes were agreed to. In addition there was discussion surrounding the issue of changing the Minutes to reflect the decision to use LEED-ND as a consistent basis of measurement in the Plan, including for calculating FAR. This amendment was agreed to. We also decided to add a notation in the phasing charts (chapter 11) indicating that they were calculated with the LEED-ND FAR definition.

   The motion carried.

3. Public comment – none

4. (Final) Review of Plan – Scott Goldstein, Teska Associates
   The meeting began by reviewing recent changes included in the March 11 Draft of the Plan, within the following four categories: Field Collected Data, Stormwater, Performance Standards/Parking/Open Space Additions to Plan, and Transportation Modifications.

   At this point Allen informed the committee that all new changes to the Plan, beginning with this meeting, would require a motion because we were officially acting on the Plan Commission Public Hearing version of the Plan.

The Field Collected Data Map (Figure 3.4 on page 3-10) was updated to show the buffer on the stream through the Rueden property (area 21 on the Growth Model, Figure 1.3). Randy Davis raised the issue that there were some inconsistencies between the Conceptual Park and Open Space Proposal (Figure 7.1) and the Growth Model. Scott Goldstein reminded the Committee that there had been about a dozen different growth models proposed, and that some of the rejected models more closely reflected the Conceptual Park and Open Space Proposal.

Stormwater was addressed next, and Scott presented a chart summarizing 'Recommended Stormwater Standards' (Table 5.4, Page 5-22). Two additional standards were noted, one citing a forthcoming EPA standard for phosphorus, and the second prohibiting 'in-line wet ponds in areas of perennial flow.' Paul Gramann asked if the retention ponds located in area 1 (the west Business Park area) would be affected, and he was told that they would not because they were not in areas of perennial stream flow.

Performance Standards/Parking/Open Space Additions to Plan
Additional changes presented included: *Infiltration:* No fine grained soil exemption; water quality and some volume reduction benefits still possible. But limit area required for biofiltration to 4% of development site. *Buffers:* Open, vegetated drainage swales wherever practicable. Disperse outfalls to streams to avoid focused impacts. *Review:* Staff flexibility to address site specific challenges / concerns. These changes can be reviewed in full on pages 5-20 to 5-21.

Transportation was addressed next, and Scott ran through some previously agreed upon recent changes to the Roadway Map (Figure 9.1, page 9-2).

1. The road connecting 'Utility Road' to Nobel, previously called Curly Oaks, was changed to 'Muriel Lane'.
2. Two arrows, indicating potential future road connections to the south into Moraine Edge Park, were added to Parks and Muriel Lanes.
3. The ROW on Notre Dame was narrowed back to 66 feet from 80 feet.
4. The ROW on Jones Farm Road was narrowed from 80 feet to 66 feet and the alignment of Jones Farm Road was removed from the map and replaced with arrows.

A change to the Multi-Use Trail Map (Figure 9.7, page 9-21) was also noted: a proposed trail along Fahey Glen was removed, as part of this road is already constructed and there is no plan to add a trail. The term 'Light Rail Transit' was replaced with 'rail/bus rapid transit' throughout the document, and a distinction between the two was added to page 9-25. It was also stated that the term 'Commuter Rail' was not a good alternative, as this term is defined in LEED-ND in a way that is inappropriate for our situation. It was reported that private shuttles (like Madison Metro's university circulator routes 80, 81, and 82) would count toward the 56 trips/day in LEED-ND, and could even count as an extra point. Finally, the text was modified relating to LEED-ND prerequisites to state that Smart Linkage & Location Prerequisite 1 may be met without the transit option.

Jay Allen made a motion, and Cheney seconded, to change 'Utility Road' to 'Monks Road,' which passed.

Steve Arnold, in his capacity as the representative of the Transportation and Transit Commission (TTC), informed the Committee that TTC had unanimously recommended approval of the Plan, albeit with several conditions. They want to add arrows south, into Moraine Edge Park, from all the remaining north/south streets, including Fahey Glen. They don't want the 56 trips/day of mass transit, one of the LEED-ND prerequisites, to be reduced, and they don't want any other changes made to the transportation element of the Plan. They also want to see all previously agreed upon changes made to the Plan, especially softening the phasing dates in the Plan. After much debate, Arnold made a motion on adding additional arrows pointing south into Moraine Edge Park, from both Fahey Glen and Notre Dame. Christianson seconded the motion. The motion failed 5 to 3: voting no were Cheney, Allen, Gramann, Wetzel, and Endl. Voting yes were Christianson, Dennis, and Arnold (Pleva voted 'present', Samuel Cooke had not yet arrived).

Arnold made a second motion to add text to the Transportation element of the Plan reading something like: "Future connections from Monks Road to Irish Lane through Moraine Edge Park may be explored based upon future planning studies." The exact language was to be agreed upon at the next meeting. Allen seconded the motion
The motion passed.

The Growth Model was displayed at this point, and two corrections were noted. Area 22 (R2) was changed from 66 acres to 68 acres, to accurately reflect a prior change to its shape. It was also noted that the labels for the wetlands would be corrected to match the Field Collected Data Map. Chris Armstrong raised the issue of hash marks erroneously indicating steep slopes, and that they should be removed (or the legend would be adjusted). Scott made it clear that the Field Collected Data Map should be the document referred to for environmental constraints, and that the Growth Model should be used as a more general land-use map.

At this point we turned to two areas in which new changes were being proposed: Land Use – FAR, and LEED-ND.

<u>Land Use – FAR</u>
Scott Goldstein explained his proposal for creating a density incentive. He suggested a maximum impervious surface ratio (ISR) for each land use category as well as a minimum FAR and a maximum FAR. The incentive is that if a specified lower ISR is utilized, called a conservation design ISR, then the maximum FAR can be waived. Essentially this was saying that you can build as big a building as you like, as long as the impervious surface area is limited to a specific ISR for each land use category. Otherwise you would have to stay under a maximum FAR. The goal of this incentive system was to create clustered development (small lots with relatively large buildings) and shared open space.

Samuel Cooke, the East Fitchburg Neighborhood Association Alternate Committee member (for Joe Rueden) arrived at 5.20 p.m.

Concerns were expressed that a maximum FAR went against the higher density goals of the neighborhood. Scott suggested that as time went on, this would be a likely location for

higher intensity development, particularly because of the height restrictions in Madison. Taller buildings tend to cause a lot of concern among the public, regarding issues of water usage, lights at night, shadows during the day time, ect… and Scott recommended the maximum FAR as a way to avoid these problems in the future. A motion was made by Arnold, and seconded by Cheney, to remove the max FAR, to adopt the minimum FARs suggested in the incentive system, and not to use the ISR table. The motion also included adding some text, such as: "The Steering Committee recommends that the Conservation Design Incentive System proposed by Teska Associates be studied further, especially as development pressure in this area increases and higher density projects are proposed. The system is spelled out in the Appendix."
Voting yes were: Cheney, Allen, Christianson, Wetzel, Arnold, Cooke, and Pleva.
Voting no were: Weidemann and Gramann.
The motion passed.

LEED-ND
The additional LEED-ND Analysis that had been requested by the Committee was presented, and it was stated that it associates specific duties with specific parties in working toward LEED-ND certification. It was also stated that the study area can be adjusted for the application. It was pointed out that a common criticism of other LEED programs is that they are a checklist which can result in very similar end products. It was therefore suggested that within the Neighborhood Pattern and Design Credit One: Walkable Streets, sufficient flexibility is permitted such that not all streets look exactly the same. The Committee was asked to consider if this analysis should be added as an appendix to the Plan.

Several Committee members agreed that they did not have enough time to fully review the LEED-ND Analysis and other recent changes, and the Committee agreed to an additional meeting on April 2nd.

The Committee agreed that the Table of Contents for the Appendix should be added to the Plan's Table of Contents, and that something should be done to avoid confusion between page numbering in the Plan and its Appendices.

A motion was made by Allen, Seconded by Arnold, to add a 'land use disclaimer' that reads:

> Land uses shown on the Growth Model may see their location, size, and/or configuration altered as a result of more detailed engineering and planning, such as, but not limited to, final park dedication area determinations, storm water facilities, or road engineering. It is not the intent to require an amendment to the neighborhood plan for minor alterations that result from technical necessities.

The motion passed.

The Implementation of Plan through Policy Updates document was discussed. Chris Armstrong wanted a firm commitment on structured parking, but it was decided that the Steering Committee cannot commit the City financially. It was resolved that the Minutes would show that Chris Armstrong believes this plan cannot be implemented without financial support from the City. A motion was made by Allen, seconded by Arnold, to add

this document to the Plan (at the bottom of page 4-6, within a section titled: Implementation of Goals Through Land Use).

5. Vote on recommending approval of Plan to the Plan Commission –
   A motion to postpone a vote on the Plan until a meeting scheduled for April 2 was made by Arnold, and seconded by Cheney. This motion passed.

6. Such other matters as may come before the Committee – none

7. Adjournment – Motion by Arnold, second by Cheney was carried at 6:09 p.m.

Minutes were taken by:
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Minutes
McGaw Park Neighborhood Plan Steering Committee
April 2, 2009

McGaw Park Steering Committee Members Present: Jay Allen, Patrick Cheney, Randy Christianson, Kris Wetzel, Steve Arnold, Brian Pleva, Dennis Weidemann, Paul Gramann, Scott Endl (Parks Commission representative), and Joe Rueden.

McGaw Park Steering Committee Members Absent: none.

Registered Citizens: Erin Ketterhagen (T. Wall Properties), Sean Robbins (T. Wall Properties), William R. Kutsunis (Fitchburg Technology Campus), Randy Davis (Heinrichs Development), and Duane F. Bowman (Bowman Farms, Inc.).

Scott Goldstein (Teska Associates) was on the phone.

A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us
The Plan and its appendices can be found online here:
http://www.city.fitchburg.wi.us/planning_zoning/NorthMcGaw.php
Labeled 'Public Hearing Draft'.
The LEED-ND Matrix is included in the appendix.
All page numbers below refer to the pagination of the March Draft.

1. Meeting was called to order at 4:06 p.m. by Chairperson Allen.

2. Motion by Cheney, second by Arnold to approve Minutes of 03/17/09.
   Scott Endl's vote was added to the majority that voted against adding arrows indicating potential future streets going south through Moraine Edge Park.
   The motion carried.

3. Public comment – none

4. Final Review of Plan
   All new changes to the Plan decided upon at this meeting required a motion because the Steering Committee was officially acting on the Plan Commission Public Hearing version of the Plan. The Committee's motions followed a document called 'Agenda Issues for the Steering Committee Meeting April 2, 2009.' The results of each Agenda Issue are below.

The first Item considered was the 'Consensus Agenda' which included the following changes. (Changes to existing text are in color and underlined. Comments made during the meeting regarding these changes are in Italics.):

- Add a tree to field Map and GM (see attached Map: Heritage Oak at Curly Oaks Lane)
  - Page 3-42 – very bottom, add the following text – "An additional heritage oak, located roughly 50 feet to the west of the fifth heritage oak mentioned above, was found to be a 39.8 inch bur oak tree in poor condition (although further examination is required)."

- The intent of the plan is for R1: Minimum Average of 5 units per acre and R2: Minimum Average of 10 units per acre. Several changes will be made to this effect: the legend on the Growth Model, the heading for R2 on Page 8-10, and the legends of the Phasing maps, Figures 11.1, 11.2, and 11.3. *Christianson clarified that net density is referred to here.*

- Page 4-5 – 4-6
  Mixed-use Development
  "Transit oriented development is most successful with the inclusion of mixed-use development. Mixed-use development refers to the practice of allowing more than one type of use in a building or set of buildings and typically includes a grouping of higher density residential and commercial uses. Mixed-use development frees up the development potential of land by allowing a number of different uses, rather than conventional single-use zoning that precluded allowing commercial and residential uses within the same area. The Plan advances land-use elements which promote development that offers the amenities of a neighborhood either within individual developments or within a short distance, while recognizing and minimizing potential conflicts between uses. The desired neighborhood mix of uses includes residential, commercial and office. Benefits of mixed-use development include:"

- Page 8-9 table 8:3 under height: change language to: "2 story buildings are encouraged, 1 story buildings are allowed if the development meets the .5 far requirement." *Pleva indicated that he wanted this language added to Table 8.2 as well. The Committee decided to address that separately, under Agenda Item 'Editing the development parameters, particularly regarding height and FAR.'*

- Page 8-12 – Institutional – add text: "A flexible use facility may be appropriate here, with some office or retail space phased out as the school expands."

- Page 8-13 1st paragraph 4th line remove "recommended"

- Page 8-18
  Sensitivity to a Mixed-Use Setting

  This Neighborhood Plan places a strong emphasis on mixed-use development. If not properly designed and planned for, mixed use has the potential of creating a number of conflicts, particularly between certain types of commercial uses and residential uses. Examples of these potential conflicts are noise from commercial HVAC equipment, noise from delivery and shipping vehicles, headlights from cars in parking lots and particulate emissions from certain types of machinery.
  The City of Fitchburg should develop standards that recognize the benefits of mixed-use neighborhoods while minimizing potential conflicts. It is also important to recognize the impact of a mixed-use or business park development being placed adjacent to existing,

established single-family neighborhoods. Areas the City should explore as it develops these standards include:

- 9-26 – Add as additional bullet point (to satisfy Steve Arnold's motion from 3/17 meeting, which passed unanimously): "Future connections from Monks Road to Irish Lane through Moraine Edge Park may be explored based upon future planning studies." *Rueden registered his opposition to this addition, as he was absent from the meeting at which it was addressed.*

- Page 10-11, Replace methodology section with:
"In order to determine the fiscal impact attributable to the proposed development, three separate models were run based upon the phases of development as outlined in Chapter 11. All of the underlying economic and fiscal data was provided by the City of Fitchburg as part of their yearly budgetary process and from actual City Budgets and Statement of Assessments. In all cases, where available, actual data provided by the City's sources was used. The number of residential units, types, square footage of various land uses, and miles of roads were based on the Plan's phases of development. The population, school children, and employment projections were based upon standardized population projections including the U.S. Census Bureau, and the American Planning Association's Planner's Estimating Guide Projecting Land-Use and Facility Needs 2004.

  Due to funding structures and budgetary calculations, residential expenses were based upon current Fitchburg populations, and then projected based upon the forecasted increase in population as a result of the expected development. For different funding structure reasons, non-residential expenses for the development were based upon current Fitchburg expenses divided by non-residential land acreage. Based upon the existing City expenditure per non-residential acre, the non-residential expenses were projected by non-residential use acreage. As for development revenues, the largest portion of development revenue is due to property tax collections that are based upon Equalized Assessed Values, which were derived from comparables in the surrounding area as well as data provided by local property owners and real estate agents."

- Page 11-6 – add text:
"Phasing maps should only be used for reference purposes - they show phases in progress of development since many of the areas are large and will develop over time. The following table indicates the percentage build-out of each land-use area on the Growth Model, by phase of development."

  Table 11.4. to Page 11-6

- Page 11-8 under plan implementation - 1st sentence remove reactive and replace with ***"collaborative"*** to be consistent with last sentence

- Page 11-11 After planning action step 9 add Convene TID Advisory Committee for the creation of the Tax Incremental Districts

- Page 11-12 2nd to the last action step include ***THRIVE and RTA***

- Page 11-13 Under utilities add action step: explore ideas for onsite energy generation

After some discussion as noted, a motion was made by Rueden, second by Wetzel to approve the 'Consensus Agenda' as it is written above. The Motion carried.

Major Agenda Items (listed on the meeting Notice).

- Tips and Techniques for Mixed Use living – *Dennis registered his opposition to one tip that read: "Residential and commercial HVAC, energy, and property maintenance equipment should be in compliance with City of Fitchburg guidelines and Codes."*

A motion was made to refer this language to Staff, and not include it in the Plan. Motion was made by Allen, second by Weidemann. The motion carried.

- Editing the development parameters, particularly regarding height and FAR
    - Page 8-6 table 8.1 TOD Height, change text to: "Allow for a range of heights and mixed use buildings to accommodate both residential and commercial to create an urban environment." *Arnold argued against this change, saying that there is value in illustrating with specific heights what the Committee envisioned for the TOD area. Christianson and Pleva, as well as Sean Robbins, argued that the change would provide more flexibility for both shorter and taller buildings depending on future mass transit and market conditions.*

A Motion was made by Christianson, second by Pleva, to make the above change. Voting in favor were: Rueden, Pleva, Weidemann, Christianson, Gramann, and Cheney. Voting against were: Arnold, Allen, and Wetzel. The motion carried.

- Page 8-6 – 8-7

  The layout of the business parks should not mirror the typical business park layout highlighted by one story buildings on large lots surrounded by vast areas of surface parking. The layout should provide a mix of building heights that accommodate market demands and achieve the .5 FAR. The proximity of the business parks to transit and a mix of uses make them ideal for green/sustainable development and should develop under the principles of LEED-ND. Design of the business park should take into account the environmental corridor and integrate that corridor in the planned use. The principles of conservation design should be applied to the business park areas.

A motion was made by Weidemann, and seconded by Wetzel, to add the language underlined above. Voting in favor were: Cheney, Allen, Christianson, Weidemann, Pleva, and Rueden. Voting against were: Arnold and Gramann. Wetzel abstained. The motion carried.

- Page 8-7 under 1st paragraph last sentence: remove "should be applied to" and replace with "are encouraged"

Motion by Rueden, second by Allen, to make the above change passed.

- Page 8-7, table 8.2 - under LEED ND Section, 5th sentence, replace with: "Encourage LEED certified buildings or other green sustainable building programs."

  AND

  Under LEED ND Section, 7th sentence, change from "apply" to "encourage"

A motion was made by Weidemann, second by Christianson, to make the above changes. The motion carried.

- Page 8-10 to 8-11: There was a discussion of the FAR for residential areas. It was made clear that the FAR in the Plan was a minimum average, and that some single family homes could have a lower FAR and therefore allow for some single story detached homes to accommodate the elderly or disabled. No motion was made.

- Conservation Design Incentive System
  Page 8-18 to 8-19:

  "The reduction in infrastructure costs, increased lot design flexibility, and real estate appreciation value are incentives enough for developers to apply conservation design principles to site development. That being said, the goal of the McGaw Park Neighborhood Plan is to reach lower impervious surface ratios through conservation development. Applicants can use a variety of means to meet these goals and incentives from the City can include: smaller minimum lot area, increased FAR, and increased density per acre in those areas to be developed. Lower impervious ratios can be reached through clustering development, smaller lot sizes, use of pervious materials, and design of buildings (e.g. two or three story single-family homes rather than large single-story ranch homes). Driveways, patios, and parking areas can be minimized and/or use pervious materials such as properly designed pavers.

  It is the intent of this Plan to generate dense uses while providing for common open space and environmental protection measures. Therefore, this Plan recommends that the City zoning code include incentives for the conservation design principles of clustered development and shared open space, public or private, to protect environmental resources. Additional conservation design principles include:

  - Design of development to compliment natural features, viewsheds, and access to environmental resources
  - Smaller lot size in exchange for larger common open spaces
  - Long-term land management plan
  - Natural stormwater design wherever possible
  - Native landscaping
  - Shorter, narrower residential streets to minimize infrastructure and impervious surfaces
  - Pervious pavers and green roofs to minimize impact of development footprint

  Developers are encouraged to include these principles in CDPs.

  The Steering Committee recommends that the Conservation Design Incentive System proposed by Teska Associates be studied further, especially as development pressure in this area increases and higher density projects are proposed. The system is spelled out in Appendix A8."

A motion was made by Arnold, second by Rueden, to edit the Conservation Design Incentive System section of the Plan (page 8-18) to read as above, and to add Appendix A8. The motion carried.

- FAR Calculation Formula
    - Table on page 8-17 – Add text to explain FAR column and what assumptions were made for the calculation

      Response from Teska:
      On 8-17, Floor Area Ratio is defined by amount of floor area (not including basements) divided by amount of buildable land. Buildable land is the portion of the site where construction can occur, and land voluntarily set aside and not constructed upon. When used in density calculations, the calculation for buildable land excludes: public streets and public rights of way, and land excluded from development by codified law or LEED for Neighborhood Development prerequisites.

    - Page 11-6:
      'The calculations in the above charts utilized the LEED-ND formula for FAR. All calculations should follow LEED-ND standards, including FAR. The LEED-ND formula for calculating FAR is contained in Neighborhood Pattern & Design Prerequisite 2: Compact Development (page 35 of October 31, 2008 draft)'.

There was some discussion of whether basement or underground parking is included as FAR, which it is not. Underground parking was further discussed, including changing the LEED-ND FAR formula to include underground parking. No motion was made. There was also a discussion of what would happen if LEED-ND changes. It was stated that changing the Plan in the future would have to follow the Comprehensive Plan review process, probably in the context of applying for LEED-ND certification.

Arnold made a motion to add text: "All references to LEED-ND refer to October 31, 2008 Draft." AND add the text above to pages 8-17 to 11-6. Second by Rueden. Motion carries.

- Text explaining the forthcoming Zoning Code's (code rewrite) relationship to development parameters in MPNP
    - Page 11-8 – to be added after the last paragraph on that page:
      "Development parameters in the Land Use section of this Plan are more general than zoning standards, and it is recognized that as a new zoning code is developed some of the development parameters herein may be altered when reconciled with the zoning code. The zoning code rewrite will be more definitive in terms of building form and site development."

Motion by Arnold to add the above text, second by Wetzel. The motion carries.

- Edits to <u>Implementation of Plan Through Policy Updates,</u> under City Assistance for Compact Development:
    - The City should evaluate its current policies regarding assistance for development (primarily TID funding) to determine if they provide adequate flexibility to handle new styles of development.

- Compact development will require structured parking. The City should pursue options available to it in order to increase the financial feasibility of structured parking, particularly at the early stages of the Plan. In particular, TID financing and the formation of a municipal parking utility should be pursued.

Motion by Allen to change text to above. Second by Christianson. Motion carries.

- In order for compact development and the related LEED-ND requirements as outlined in this Plan to succeed in the early stages (and possibly beyond), it is recognized that public assistance funding may be necessary for development projects. Early stage development projects should be afforded some flexibility in order to transition into the full implementation of the Plan.

Motion by Allen, second by Christianson, to add the above bullet point. Arnold made a motion to amend, second by Rueden, to remove the last sentence of the above bullet point. Voting in favor of the amendment were: Arnold, Cheney, Weidemann, and Rueden. Voting against the amendment were: Allen, Christianson, Wetzel, Pleva, and Gramann. The amendment failed 5 to 4. The main motion carries.

- The City should consider options available to it to specifically attract users who are most suited to more compact development. The need for the City to use incentives for users who are naturally inclined to be in compact development will likely be less. However, providing opportunities (through public assistance funding and/or through flexibility in the compact development and the related LEED-ND requirements) for users not otherwise financially inclined/able to locate in compact developments should be maintained in order to continue to attract a wide range of new and growing businesses to the commercial and business park development areas.
- The City will be rewriting its zoning code starting in 2009. It will be important within this code to provide for expedited approval for projects that meet a set of predetermined criteria. The sometimes protracted approval process adds significant cost, both monetarily and in time, and a more efficient process will assist in reaching the compact development goals that the City has.

Motion by Dennis, second by Rueden, to reject the additional text (underlined) above. Motion carries.

- LEED-ND Analysis –

Motion by Allen, second by Arnold, to add the redline version of the LEED-ND Analysis as an appendix to the Plan. Motion carries.

Open Space and Recreation

- Park and Open Space, Page 1-11, 7-9, & 8-14-15 (this paragraph is repeated in these three locations)

  "The City of Fitchburg requires a park and open space dedication of 2,900 square feet per new residential unit. Based on this factor, 126.7 acres of park and open space is required. This may be a combination of both on-site open space or public plazas, as well as public parks being planned both within the Neighborhood (such as the expansion of McGaw Park), and beyond (such as the planned Moraine Edge Park just south of the Neighborhood). Based on the Plan, 87

acres is set aside as parks, which includes the existing McGaw Park and Johnson Park (49-acres), a 32-acre expansion to McGaw Park, and a new 6-acre park south of Nobel Drive. Therefore, 38 acres of *new* Park and Open Space are specifically shown as land uses within the Plan. The remaining 88.7 acre requirement can be fulfilled with additional neighborhood parks and other public spaces likely to be required within the neighborhood, parks outside the neighborhood boundary, as well as Fee-in-lieu-of Parkland Dedication provision. In addition to this open space, 100 acres of Environmentally Sensitive land is not buildable, which includes wetlands, environmental corridors, and areas with large concentrations of heritage and specimen trees. The planned Moraine Edge Park would be 174 acres, just beyond the neighborhood boundary to the south. Specific implementation recommendations regarding Parks are included on page XXX."

Motion by Cheney, second by Rueden, to change the text as shown above. Scott Endl stated his support for this motion. The motion carries.

"In 2007, a capstone project was completed for Fitchburg Parks and Recreation by Ryan Bachmeier at the University of Wisconsin-Madison Landscape Architecture Program. The project analyzed current conditions and provided conceptual ideas for expanded programming and improvements both to the existing McGaw Park and the planned expansion to the Park. It also looked at the facilities at McGaw Park in relation to other parklands in Fitchburg.

An unapproved conceptual plan for McGaw Park was developed as a part of Ryan Bachmeier's capstone project. Please note that the findings of Ryan Bachmeier's project do not necessarily reflect the policies of the Fitchburg Park Department nor the City of Fitchburg. These ideas have not been adopted by the City, but illustrate the type of programming that could provide improvements to the Park as well as benefits for all of Fitchburg. The plan included the following elements: new shelter with concession stand; 18 hole championship disc golf course; updated trail network; additional soccer/multi-use fields; additional tennis courts (lighted); 2 full basketball courts (lighted)' volleyball courts; additional softball field; larger playground; new horseshoe pits; expanded prairie natural area; and additional parking and a new Central Park Drive that would extend southward and connect to potential new development being considered as a part of the Urban Service Area expansion. The MPNP does not recommend a car connection through McGaw Park from Lacy Road to the south."

Motion by Cheney, second by Arnold, to change the text as shown above. Scott Endl stated his support for this motion. The motion carries.

Light Manufacturing/Industrial:

- Pages 1-17 and 10-9 (the same sentence appears in both places)
  "Due to the current success of Fitchburg Technology Campus and Fitchburg Center, additional office, light manufacturing, lab space, and supportive commercial is expected to be attracted to the area."
- Page 4-2 add under 1 last bullet point ***"office light manufacturing, lab space and supportive commercial".*** Add under 4 3rd bullet point ***"socially and economically viable"***

Motion by Pleva, second by Christianson, to add the text underlined above to pages 1-17 and 10-9, to keep references to light manufacturing/industrial in Table 8.2., and to make the changes under the second bullet for page 4-2. Motion by Rueden to amend, second by Arnold, to address the second

bullet point (for page 4-2) separately. Motion carries. Dennis states that the Committee is not endorsing an 'industrial park' for the Business Park areas of the Growth Model. The amended motion carries.

Motion by Pleva, second by Christianson, to make the text changes under the second bullet point (for page 4-2), first sentence. Motion fails.
Motion by Arnold to reject the second sentence under page 4-2, second by Rueden. Motion carries.

- Page 1-7 Neighborhood Plan Vision (pages 1-7 and 4-1):
  "Develop an urban, green, sustainable, transit-oriented, mixed-use, and economically vibrant neighborhood that offers a variety of land uses to serve everyday living needs, as well as a housing stock to serve all levels of age and income, which will not affect the existing on-site natural resources."

Motion by Pleva, second by Christianson, to add the text underlined above. Voting yes were: Cheney, Christianson, Allen, Pleva, Gramann. Voting no were: Arnold, Weidemann, Wetzel, Rueden. The motion carries.

- Page 1-8 under Economic Development Goals, #1
  "Encourage economic development opportunities that recognize market trends and are appropriate to the resources, character, and service levels in the City."

Motion by Pleva, second by Christianson, to add the text underlined above. Voting yes were: Pleva, Christianson. Voting no were: Gramann, Rueden, Wetzel, Weidemann, Allen, Cheney, Arnold. Motion fails.

- Page 5-50 figure 5.21 Sanitary Sewer Phasing shows FTC in Phase 2, shouldn't it be Phase 1?

It was noted that this was already fixed and that the map would be updated in the next draft. Rather than make a change to the phasing in Figure 5.21 and elsewhere however, it was agreed (with no motion made) that Figure 5.20 would be changed such that the extent of the area served by the Woods Hollow Interceptor (in green) would be enlarged to correspond to Figure 5.21.

- Page 7-10 LEED ND certification make sure it says ***1 (one) building must be LEED certified and that other types of green building are allowed and encouraged Please make changes that have references to building located within this plan*** (emphasis in original).

This item was discussed, and it was noted that the LEED-ND Analysis specifies that only one LEED certified building is required for LEED-ND certification, and that LEED-ND allows for other green building systems as part of its point structure. The Committee further noted that this issue was address by adding similar language to Table 8.2. No action was taken.

- 9-15 Construction Phasing (First bullet point):
  "It is recommended to construct Nobel Drive to Fahey Glen and Fahey Glen to Nobel Drive as part of the initial development of the western portion of the plan. This construction will provide development on the western portion of the MPN at least two points of access to the existing roadway system, which is desirable for emergency operations. The Steering

Committee further recommends that Fahey Glen be extended north to East Cheryl Parkway at this time as well, to draw traffic away from Mica and Lacy."

Motion by Arnold, second by Cheney, to add the underlined text above. Voting yes were: Gramann, Rueden, Wetzel, Weidemann, Cheney, Arnold. Voting no were: Pleva, Christianson, Allen. The Motion carries.

- Page 9-27 under parking/ incentives for alternative modes page reference Jay's Implementation Plan in Chapter 4 at the end of the last sentence ***"nor putting Fitchburg at a disadvantage in comparison to our neighboring peer communities"***

This Item was removed from consideration by its author without objection.

- Page 8-10 The following language was included on page 8-10:
  "Density in Tarpleywick Hills should increase as redevelopment occurs over time to reflect its proximity to the transit station and TOD."

Motion by Cheney to remove the above text, second by Weidemann. Voting yes are: Weidemann, Allen, Cheney. Voting no were: Gramann, Rueden, Wetzel, Pleva, Arnold, Christianson. Motion fails.

- Page 9-14 – Motion by Cheney to say that the Tarpleywick Hills neighborhood should be involved in planning the Nobel/Syene intersection. *Allen stated that this doesn't need to be said because that is the normal course of business in Fitchburg.*

The motion did not receive a second.

- Motion by Cheney to include text specifying the need for the McGaw Park expansion to extend all the way to Syene, and for the area closer to Syene to include a stormwater facility and multi-use pathway. *The difficulty of the Syene/Nobel intersection and the role professional engineering would play in dictating its outcome was discussed briefly.*

The motion did not receive a second.

- Page 9-14 **Syene Road intersection with Wildheather Drive:**
  "Wildheather Drive is an existing residential street that intersects Syene Road approximately 350-feet north of the proposed Syene Road intersection with Nobel Drive. Every effort should be made to maintain full access at the intersection in the future. Access to the neighborhood can be made via Jones Farm Drive, or via a connection to Syene Road from the western TOD area."

Motion by Cheney, second by Arnold, to remove the following sentence from the above paragraph: "Queuing at the Syene Road intersection with Nobel Drive may require Wildheather Drive to be restricted to right-in/right-out only in the future." The paragraph will read as it is written above. Motion carries.

Comments regarding LEED ND and 300 ft buffer

- We turned our attention at this time to some comments from T. Wall Properties. There was a brief discussion of what uses can go into the 'environmentally sensitive' areas (particularly

regarding this section on page 1-13). The text notes that the Comprehensive Plan will control that issue, but that it would not preclude some active park uses and even park shelters (page 4-20 to 4-21, Comprehensive Plan). No motion was made.

- Implementation of Plan through Policy Updates (second bullet):
  "The City should establish guidelines for potential uses, such as park uses, within the 300' wetland corridor and determine whether and under what circumstances property within the corridor can be counted as parkland dedication. These guidelines should be established around the principles of education, public access, and the protection of natural resources."

Motion by Christianson to add the underlined text above. Second by Pleva. Motion carries.

- Page 11-8 (bottom):
  "Additionally, each Comprehensive Development Plan should indicate how it meets the LEED-ND targets." *We discussed, with Erin Ketterhagen (T. Wall Properties), what form this would take and what minimum number of LEED-ND points would be required. It was discussed that a CDP could include the LEED-ND Analysis included as an Appendix to this Plan, complete with those points the developer intends to achieve. The specific numbers would have to be a negotiation with the Plan Commission, as is the case for compliance with the Comprehensive Plan generally.*

Motion by Christianson, second by Pleva, to remove the above sentence. Motion fails.

- Christianson asked how CDPs will be evaluated generally, and if amendments to the Comprehensive Plan would be required for minor allowances. It was discussed that no one wants to be amending the Comp Plan for minor things, and that it can only be amended once a year, and that the process will likely be 4 to 6 months. It was further mentioned that a benefit of LEED-ND is the flexibility built into the process of choosing which points to pursue. No motion was made.

McGaw Neighborhood Draft Questions

- We turned now to the list of questions from the Department of Economic Development. Staff (Joyce Frey and Mike Zimmerman) explained that many of these were talking points, and would need to be addressed after the Plan is approved. They pointed out two significant issues, beginning with signage. They stated that signage is not in the zoning code rewrite, and right now it is more of a suburban code. Allen and Arnold both implied they were in agreement that this is an issue that will need to be addressed. No motion was made.

  The second issue was the definition of a convenience store (page 8-9, 1st paragraph). Does this allow for a gas station? And is that a reasonable assumption for a developer to make? Duane F. Bowman stated that gas stations are not really being built due to the uncertain future of oil. Convenience store is not defined in our Plan. No motion was made.

  Seeing no more Items on the Agenda and hearing no more discussion, Allen and Arnold thanked the Committee for all their time and effort, Teska Associates, for leading the consultant team,

and Matthew Steigman, for staffing the Plan. At this point everyone thanked, praised, and congratulated everyone else, including Jay Allen for all his work.

Duane F. Bowman, Vice President & CEF of Bowman Farms, Inc. registered in support of the Plan and submitted the following statement, which was read at this time.

"As a property owner within the planned neighborhood, we salute the efforts of Chairman Allen and members of the McGaw Park Neighborhood Steering Committee, who have provided their time and expertise, and especially those committee members and others who have contributed financially, to the successful implementation of the Plan and the resulting expansion of the tax base for our City.
Thank you for the opportunity to comment."

5. Vote on recommending approval of Plan to the Plan Commission –
   Motion by Arnold to approve the McGaw Park Neighborhood Plan as amended. Second by Christianson. Voting yes were: Jay Allen, Patrick Cheney, Randy Christianson, Kris Wetzel, Steve Arnold, Dennis Weidemann, Paul Gramann, and Joe Rueden. Voting no was Brian Pleva.

6. Such other matters as may come before the Committee – Cheney requested the Steering Committee be provided at least 11x17 inch, or preferably larger sized copies of the Growth Model and the Field Collected Data Maps. He stated the purpose of this request was "for Steering Committee members to have a final version of the Neighborhood we created, and have a reference for comparisons as the Neighborhood is eventually built out." This was referred to city staff.

7. Adjournment – Motion by Allen, second by Rueden was carried at 7:44 p.m.

Minutes were taken by:
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North McGaw Neighborhood
Public Information Session
June 19, 2008

Present: Jay Allen, Tom Darcy, Patrick Cheney, Steve Arnold, Randy Christianson, Randy Davis, R.L. Mandt, Jon Baryenbruch, Jon Blakeman, Nancy Halford, Herb Haas, Fran Haas, Pat McGaw, Michael Wallace, Verla Wallace, Ed Parrish, Carolyn Parrish, Scott Berger, Kristin McConnell, Kurt Gutknecht, Michael Stoneman, Mary Fahey, Tom Dichraff, Loretta Dichraff, Kurt Keifer, Mike Fahey, Kate Schachter, Mindy Dumermuth.

Also Present: Tom Hovel (City of Fitchburg), Scott Goldstein (Teska), Ben Carlisle (Teska), Steve Gaffield (MARS), Jeff Kraemer (NRC)

Alderman Jay Allen opened the Public Information Session describing the purpose of the plan to take a comprehensive look at how this area should develop and how urban services should be extended to serve the area.

Scott Goldstein from Teska Associates provided an overview of the process and an outline of two public information sessions and four neighborhood summits that will be taking place to solicit involvement and contributions from the public into the process.

Steve Gaffield from Montgomery Associates and Jeff Kraemer from Natural Resources Consulting presented a brief overview of the environmental resources in the area.

Public Comments Included:

- What is the Environmental objective?
- Will economics/market be considered as part of the plan? Will an Economic Impact Study be conducted?
- Preserve tree lines, tree clusters, and tree stands.
    - Tree lines are important for buffer and habitat preservation.
    - Preserve as many trees as possible, even if they are too small to be identified.
- Preserve existing small waterways.
- Control and property manage stormwater run-off.
- To avoid traffic on US-14 and Fish Hatchery, many people use Lacy
    - Reduce cut-through traffic on Lacy and Irish Lane.
    - Concern over increased traffic on Irish Lane due to new development.
- Will rail line be moved?
    - How do you plan for ATC line?
    - Is there an opportunity for Transit Oriented Development

- During the phasing of development of area, consider vacancy and assimilation rates?
    - Why is the Tech Park expanding when they still highly vacant?
- How / Why did this planning process start?
    - Who is paying for process?
- What land uses are being considered?
    - Is Industrial/Tech Park uses being considered?
- Will the plan include private property?
- How long will phasing and neighborhood build out last?
- We already have vacant land in USB in Fitchburg, why are we adding more?

Minutes
McGaw Park Neighborhood Summit
July 10, 2008

I. Meeting Opening – 6:41

Meeting opened by Alderman Jay Allen. Alderman Allen explained the North McGaw Neighborhood planning process. This is the first of four Neighborhood Summits; however, the Steering Committee has been working hard to identify neighborhood Issues and Opportunities that will need to be addressed through this planning process. Aldermen Allen noted that the Steering Committee seeks the input of the pubic throughout this process.

II. Issues and Opportunities Presentation

a. Environmental Issues

Steve Gaffield of Montgomery Associates Resource Solutions summarized the environmental issues and opportunities including:

- Local Water Resource Features:
  - Nine Springs Creek: Located north of the study area, near the edge of Madison's developed urban area.
  - Swan Creek: Originates in the study area and flows eastward through the Waubesa Wetlands to Lake Waubesa.
  - Murphy's Creek: located approximately 1.5 miles south of the study area, and the North McGaw Park project area is entirely outside of the Murphy's Creek surface watershed.
  - The Waubesa Wetlands State Natural Area: Located approximately 2 miles east of the North McGaw Park project area near the southwestern tip of Lake Waubesa, includes some of the highest quality and most diverse wetlands in southern Wisconsin.
  - Lake Waubesa : Receives surface inflow from the Yahara River and upstream Yahara lakes, Nine Springs Creek, Swan Creek and Murphy's Creek. It also is fed by groundwater, including a prominent spring near the southwestern end of the lake.
- Existing Hydrologic Data:
  - Streamflow
  - Groundwater studies
  - Aquifers
- Environmental Resources:
  - *Woodlands*: Seven separate woodland communities are scattered throughout the project area. The woodland communities include:

Oak/Hickory Forest; Oak/Walnut/Black Locust Forest; Box Elder Woodland; Remnant Oak Savannah; Shrub Dominated Woodland; and tree lines.

- *Waterways*: There are seven drainage features within neighborhood that can be categorized into navigable and non-navigable waterways. Two of the seven drainage features identified within the neighborhood have been determined to be navigable waterways by the Wisconsin Department of Natural Resources.
- *Wetlands*: The two wetlands present are located in the eastern portion of the North McGaw Park Neighborhood.
- *Soils*: North McGaw Park Neighborhood soils will be field-evaluated this fall.
- *Cultural Resources:* Not identified
- *Wildlife Habitat Potential:* Not identified

b. LEED-ND

Scott Goldstein of Teska Associates summarized the target goal of obtaining LEED-ND certification for the North McGaw Park Neighborhood. The LEED-ND Rating System integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design. Mr. Goldstein explained that LEED-ND emphasizes the creation of compact, walkable, vibrant, mixed-use neighborhoods with good connections to nearby communities. In addition, LEED-ND encourages convenient transportation choices such as buses, trains, car pools, bicycle lanes and sidewalks. Mr. Goldstein noted that the easiest way to obtain LEED-ND is to average a residential density of 7 development units per acre and locate such development near transit.

c. Density Examples

Ben Carlisle of Teska Associates explained the target goal of creating a transit-oriented neighborhood, which has a minimum net density of 8 dwelling units per acre. The individual site density will vary throughout the neighborhood in the general range between 5 to 20 du/acre. Mr. Carlisle went on to explain that density comes in various land use types and styles. To illustrate this point and start a discussion, Mr. Carlisle showed various land use types and styles at various densities between 5-10 du/acre, 11-20 du/acre and 21 + du/acre.

III. Issues and Opportunities Discussion

After the issues and opportunities presentation, the group was broke into two smaller groups for discussion. Mr. Gaffield led a small group discussion on environmental issues. Mr. Goldstien and Mr. Carlisle led a small group discussion on LEED-ND, goals, and density. Each small group concluded with small group members placing 3 or 4 sticky dots next to each goal they felt was the most important element to consider as part of the North McGaw Neighborhood planning process.

The following land use and housing public comments and questions were raised in the small groups:

- Preserve agriculture and environmental
- Will open space/park remain between power lines and Irish Lane?
- Keep area consistent with adjacent land uses.
    - Type

    - Scale
- Will existing residents be required to tap into urban services when lines are extended
    - Policy of City
    - Laws?

<u>The following density and land-use comments: were raised in the small groups</u>

- Like Swan Creek: You can stay in area as needs change.
- Mix up patterns, don't want monotonous, massive buildings.
- Don't like on street parking or open, unscreened parking.
- Want developments to have variety of housing types for all family types and ages.
- Design narrower streets to prevent on-street parking.
- Like examples of higher density with larger open spaces.
- Incorporate urban commercial areas.
- Include bike paths.
- Concerned about density mixes, scale, and bulk
    - 12 unit apartment across from single family
- Concerned about concentration of rental
- Two sides: mix density vs. separate density
- Plan needs flexibility to meet market conditions
- Plan for expected traffic.

Rank of Neighborhood Planning Goals by Participants at Neighborhood Meeting
(ranked by number of dots)
July 10, 2008

41 dots → ***Environmental goals:***

1. Protect and rehabilitate the natural environment

- Minimize adverse affects on neighborhood assets (water, tree lines, privacy, plant life, and animal migrations).
- Seek opportunities to restore environmental resources and restore legacy features of the land;
- Assure that groundwater budget is unimpaired and hydrologically neutral.
- Preserve heritage trees.
- Protect air and noise quality.

22 dots → *2.* Design the neighborhood to compliment environmental protection.

- Design a neighborhood in which basic needs can be achieved with minimal driving.
- Promote green building techniques.
- Promote carbon neutral development.
- Minimize use of land for surface parking;

12 dots → *3.* Provide public access to unique natural areas

- Provide green natural place within a short walk of every place in the neighborhood.
- Promote both active and passive recreation.
- Plan parks in coordination with surrounding area
- Don't exceed ability to maintain parks

Agricultural Resource Goals:

2 dots → *1.* Through orderly planning of North McGaw Park, preserve agricultural land beyond the area as a resource for the use and benefit of current and future generations.

0 dots → *2.* To protect and maintain agriculture as a significant resource within Fitchburg.

Economic development goals:

1. Encourage economic development opportunities appropriate to the resources, character, and service levels in the City.

- Ensure that development raises tax revenue to pay for its own services.
- Promote diverse uses to meet a variety of needs.
- Promote policies that are marketable and financially viable.
- Design flexibility and balance in land uses.
- Provide high quality office space to support jobs and housing.

2. Provide that retail and service areas are adequately sized and appropriately placed within neighborhood and the community.

- Provide for services for neighborhood.
- Develop commercial uses to fit into a larger market and community.

3. Preserve agricultural based businesses as an economic opportunity.

- Build on agricultural roots, food production, and buying food through local sources.

4. Preserve and enhance resources when developing economic opportunities.

- Promote economic integration / diverse housing prices and housing stock.
- Provide land uses that support jobs for entry level through executives.
- Provide financial incentives for socially desirable goals.

Community character (Cultural)

1. Promote and preserve the City's cultural resource base.

- Promote sense of place/sensitivity to the land.
- Design development to fit the land and topographical features.

2. Actively seek to strengthen strong cultural and social history and community identity

- Foster the identity of McGaw Park at the core of the neighborhood, and a foundation of the Fitchburg park system.
- Seek education resources and a neighborhood school.
- Promote diversity of design to support a range of opportunities.

Land Use Goals

15 dots → *1.* Preserve and enhance the natural and agricultural resources and features of the city.

- Follow a pattern for development consistent with the long term urban growth map and its related phasing plan.
- Protect environmental resources from development by promoting sustainable development and revitalization.

4 dots → *2.* Develop a compact urban community that is visually and functionally distinct from its rural and agricultural community.

- Promote infill, reinvestment and redevelopment of land and uses.
- Restore underutilized, blighted, or underdeveloped properties within current commercial and residential neighborhoods.
- Preserve open space, natural areas, and rural and agricultural land by promoting compact development that contains a logical and sustainable mix of use and building types.
- Extend utilities and infrastructure in a way that balances market demand with an average annual growth rate not to exceed 75 acres per year, and using existing and proposed infrastructure in an efficient manner.

Housing

12 dots → *1.* To provide for balanced residential growth in the City with a variety of housing types, to promote decent housing and suitable living environment for all residents, regardless of age, income or family size, and to encourage an adequate supply of affordable housing in each new urban neighborhood.

- Promote development of housing to meet forecasted needs.
- Promote the development and preservation of long-term entry level housing for low-moderate income residents
- Recognize the value of existing housing and established neighborhoods, and support rehabilitation efforts, both public and private, while maintaining the historic, cultural and aesthetic values of the community.

4 dots → *2.* Promote the efficient use of land for housing

- Encourage compact neighborhood and development patterns.

Transportation

11 dots → *1.* Design complete streets that promote pedestrian and bicycle movement as well as cars.

9 dots → *2.* Carefully plan additional road capacity.

4 dots → *3.* Promote transit-friendly design and fine grain texture of healthy neighborhoods with walkable, short blocks.

3 dots → *4.* Minimize impact on existing roadways and infrastructure by planning for multiple modes of transportation

2 dots → *5.* Consider extensions of transit including bus and light rail to make neighborhood transit accessible.

1 dots → *6.* Promote development in areas that encourages options to alternative transit modes.

IV. Meeting Closing – 6:41

Meeting closed by Alderman Jay Allen.

Next Neighborhood Summit will be held on August 21

Minutes
McGaw Park Neighborhood Summit
August 21, 2008

I. Meeting Opening – 7:00 pm

Meeting opened by Ald. Jay Allen. Ald. Allen explained the North McGaw Neighborhood planning process. This is the second of four Neighborhood Summits. The purpose of tonight's meeting is to present Growth Model Concepts that have been reviewed by the Steering Committee. Ald. Allen noted that the Steering Committee seeks the input of the pubic throughout this process.

II. Review of Process

A. Scott Goldstein of Teska Associates summarized the ongoing public process:
   i. This is the second of four neighborhood summits. After the growth model concepts have been refined in the upcoming month, more detailed environmental and transportation analysis will take place in the next few months.
   ii. Two more neighborhood summits in January and February of 2009.
   iii. Final adoption of plan is expected in April 2009.

III. Review of Input and Goals

A. Scott Goldstein of Teska Associates summarized the input and goals from the July 10 Neighborhood Summit :
   i. Environmental goals:
      1. Protect and rehabilitate the natural environment
      2. Design the neighborhood to compliment environmental protection.
      3. Provide public access to unique natural areas
   ii. Agricultural Resource Goals:
      1. Through orderly planning of North McGaw Park, preserve agricultural land beyond the area as a resource for the use and benefit of current and future generations.
      2. To protect and maintain agriculture as a significant resource within Fitchburg.
   iii. Economic development goals:
      1. Encourage economic development opportunities appropriate to the resources, character, and service levels in the City.
      2. Provide that retail and service areas are adequately sized and appropriately placed within neighborhood and the community
      3. Preserve agricultural based businesses as an economic opportunity.
      4. Preserve and enhance resources when developing economic opportunities.
   iv. Community character (Cultural)
      1. Promote and preserve the City's cultural resource base.

2. Actively seek to strengthen strong cultural and social history and community identity

v. Land Use Goals
1. Preserve and enhance the natural and agricultural resources and features of the city.
2. Develop a compact urban community that is visually and functionally distinct from its rural and agricultural community

vi. Housing
1. To provide for balanced residential growth in the City with a variety of housing types, to promote decent housing and suitable living environment for all residents, regardless of age, income or family size, and to encourage an adequate supply of affordable housing in each new urban neighborhood.
2. Promote the efficient use of land for housing

vii. Transportation
1. Design complete streets that promote pedestrian and bicycle movement as well as cars.
2. Carefully plan additional road capacity.
3. Promote transit-friendly design and fine grain texture of healthy neighborhoods with walkable, short blocks.
4. Minimize impact on existing roadways and infrastructure by planning for multiple modes of transportation
5. Consider extensions of transit including bus and light rail to make neighborhood transit accessible.
6. Promote development in areas that encourages options to alternative transit modes.

B. Scott Goldstein of Teska Associates summarized the LEED ND certification.

IV. Review of Water Resources

A. Steve Gaffield of Montgomery Associates Resource Solutions summarized the onsite and adjacent water resources:

i. Nine Springs Creek: Located north of the study area, near the edge of Madison's developed urban area.
ii. Swan Creek: Originates in the study area and flows eastward through the Waubesa Wetlands to Lake Waubesa.
iii. Murphy's Creek: located approximately 1.5 miles south of the study area, and the North McGaw Park project area is entirely outside of the Murphy's Creek surface watershed.
iv. The Waubesa Wetlands State Natural Area: Located approximately 2 miles east of the North McGaw Park project area near the southwestern tip of Lake Waubesa, includes some of the highest quality and most diverse wetlands in southern Wisconsin.
v. Lake Waubesa : Receives surface inflow from the Yahara River and upstream Yahara lakes, Nine Springs Creek, Swan Creek and Murphy's Creek. It also is fed by groundwater, including a prominent spring near the southwestern end of the lake.
vi. Streamflow
vii. Groundwater studies
viii. Aquifers

V. Presentation of Opportunities and Constraints

A. Scott Goldstein of Teska Associates presented the McGaw Neighborhood Opportunities and Constraints. The opportunities and constraints were presented on a map for the public review.
   i. Environmental Resources
   ii. Sanitary Capacity
   iii. LEED ND
   iv. Transportation
   v. Nobel Road
   vi. Expansion of McGaw Park

After the presentation, discussion ensued regarding the opportunities and constraints.

Public discussion included why the area is planned to be developed. Goldstein and Ald. Allen answered that by developing this area in a relatively high density manner, farmland will be protected to the south for at least the next fifty years. Thoughtful growth will utilize far less farmland than unplanned expansion. Ald. Allen added that housing stock in Fitchburg needs to provide multi-family housing to serve residential needs.

VI. Presentation of Guiding Principals and Growth Models

A. Scott Goldstein of Teska Associates presented the McGaw Neighborhood Growth Model Guiding Principals and the Growth Models.
   i. The Growth Model Guiding Principals were based upon the following:
      1. Opportunities and Constraints
      2. Goals of the Neighborhood
      3. Steering Committee
   ii. The Guiding Principals included:
      1. Transit Oriented Uses and Public Transportation node at Lacy and Syene Road intersection
      2. Smaller Transit node on west end of neighborhood
      3. Extend Nobel Drive
      4. Commercial and higher density residential is located along transportation corridors and at periphery of neighborhood.
   iii. The three growth models were presented.

After the presentation of the three growth models, discussion ensued.

Public comments included ensuring that Nobel Road is easy to travel, create buffers between existing single-family and proposed business park expansion, reduce travel through Mica and other residential streets, ensure that there is a range of housing available in the area including single-family residential, and create an internal grid street system.

VII. Meeting Closing – 8:58

Meeting closed by Ald. Jay Allen.
Next Neighborhood Summit will be held on January 19, 2008

Minutes
McGaw Park Neighborhood Plan
Public Information Meeting
September 18, 2008

I. Call to Order – 6:37 p.m.

Meeting opened by Ald. Jay Allen. Ald. Allen explained the North McGaw Neighborhood planning process, and where we are in that process. This is the fourth of six public meetings. The Growth Model has been approved by the Steering Committee, and the consultant team is analyzing how well this model will address the goals and constraints that have been developed regarding transportation, environmental, and sanitary sewer issues. Updates on those analyses will be provided to the public at Neighborhood Summits in January and February 2009, as well as at tonight's meeting. The purpose of tonight's meeting is to review the input from the August 21st Neighborhood Summit, a presentation by Jeff Kraemer of Natural Resources Consulting and Rob Montgomery of Montgomery Associates on relevant environmentally sensitive areas and natural resources issues, [the presentation by Teska Associates on current and future land use was added to the notice erroneously], and finally feedback from the public especially regarding future land use.

II. Review of Input from August 21 Neighborhood Summit

Ald. Allen reviewed the Growth Model, highlighting how concerns raised at the August 21 Summit are reflected in that model. These items included the route of Nobel Drive and the location of the traffic circle, the institutional land use near the traffic circle, the location of the transit station, the layout of the east Business Park to keep the residential land use away from HWY 14, and the extent of the McGaw Park extension to Syene.

III. Public Comment

Many questions and concerns were raised regarding the Growth Model:

- There is flooding near the corner of Irish Lane and Syene. What is being done to ensure the North McGaw Park Neighborhood Plan (NMPNP) will not exacerbate this problem?
    - The range of infiltration and detention options was outlined, highlighting that the detailed analysis of what is required is forthcoming.

- Why is the Transit Oriented Development (TOD) so close to the R1/ Tarpleywick Hills neighborhood? What might a transition look like?
    - Because of the required density within a ¼ mile of the transit stop, and the lack of any alternative for placement of the transit stop, the TOD must abut Tarpleywick Hills. The neighborhood plan will not be written to the level of detail required to determine the form of a transition.

- Will there be connections between Irish Lane and NMP, through Moraine Edge Park?
  - Probably two small roads, park roads, but that is also yet to be determined.

- Will Syene be moved West?
  - Yes, and actually the Growth Model already reflects the future alignment.

- What if the proposed power-line comes through this area?
  - It will fit within the existing ROW. They have formats where they can put both on one tower. We are still hopeful it will go along the beltline.

- The traffic on Lacy is terrible, will there be a sidewalk?
  - There will be sidewalk from Fish Hatchery to the new roundabout. East from the roundabout there are no plans yet.

- Why isn't the BP on the west side of the study area bigger, further south and east?
  - The Mixed Use (MU) area south of this BP does not preclude BP uses, but it also allows for residential and retail.

- What if people don't sell, particularly along the route of Nobel?
  - That is always an issue, but not one that can or should be planned around.

- How will the phasing go?
  - Sanitary Sewer is a primary factor, but this is one of the next issues to be tackled.

- Why is the residential density set to an average of 7 du/ac, and is there an upper limit?
  - There is no upper limit, but we don't anticipate having this problem; conversely, the 7 du/ac is required to stay within the City's Comprehensive Plan and to achieve sufficient densities for LEED-ND certification.

- Is zoning going to be so specific as to distinguish between single family and multifamily housing?
  - The zoning has not been determined.

- Can we limit density?
  - We are trying to encourage density. The market will not support offensively high densities.

- What is the timeline for the light-rail?
  - 5 to 8 years, but Green Tech Village (GTV) is a major factor and we are starting to see progress there. We expect a Comprehensive Development Plan from the developer by the end of the year.

- Will Oregon use the rail line for freight?
  - This is a complicating factor, but they only expect 2 or 3 freight trips per week which is easy to schedule around. The tracks can handle freight and light-rail.

- Nobel will be the major thoroughfare?
  - Yes

- Please don't widen Lacy
  - There is no plan to do that and it will not happen.

- Will there be a convenience store on Nobel?
  - One would be allowed in the current growth model.

- Can you guarantee Irish Lane will not be widened?
  - There is no plan or discussion of that in this plan, and by building to higher densities in NMP, it becomes less likely that development will move south and require such a measure.

- Is this area completely in the Oregon school district?
  - No, the west part of the study area is in the Madison School District.

IV. Natural Resources Investigation, NRC and Montgomery Associates

The presentation described below will be added to the Teska website:
http://www.teskaassociates.com/fitchburg/documents.htm
A video-tape of this Meeting can be obtained from FACTv (Fitchburg Access Community Television). For information email FACTv@city.fitchburg.wi.us

Natural Resources Investigation - Jeff Kraemer from NRC and Rob Montgomery from Montgomery Associates provided an update on resource analyses, covering the regional monitoring, study area investigations, resource issues to conclude as part of growth model review, and the plan for detailed environmental analysis of the growth model and land use for the study area.
A map of the monitoring sites was displayed and it was noted that the water resources goals are driven by downstream resources. The areas to be covered in this section were identified: continuing stream flow monitoring, biological inventory, and a review of water resource goals. Stream flow monitoring was explained with an example graph in which water temp and water level were charted against time. It was explained that examining the relationship between temperature and water level can reveal how water is getting to the stream. The sample locations for the biotic analysis were mapped, and the mechanisms for making the measurements was described, including taking samples for macro-invertebrates and shocking the stream to get counts of fish to determine the quality of the stream in terms of habitat. The presence of cool water fish and warm water fish indicate that this cool water stream is getting warmer. The biotic analysis and the temp and water level analysis were combined to determine that the South Branch of Swan Creek provides a good quality habitat overall. Swan Creek at Lalor Road was the site studied, and this site was determined to be a poor quality habitat with a high degree of degradation and disturbance. The unusual mix and low counts of both cool and warm water species identified indicate very poor quality cold water habitat. Murphy Creek at Lalor Road was determined to have good quality habitat, with cool, swift moving water and good riparian habitat. The conclusion at this point was that the South Branch of Swan Creek is nice now, but that it is being degraded and is at the breaking point.

Study Area Investigations: Floodplains study, Sanitary Sewer Service, Analysis of Ecological Survey Results - A smaller scale map was then displayed showing the capture areas of springs in the region (from Susan Swanson's PhD research), which underlies the water management analysis. The water management goals were outlined: maintain groundwater recharge, minimize runoff impact on South Branch, and to protect water quality. Starting with the floodplains, a brief update was given on FEMA's progress revising the flood insurance rate maps (FIRMs), which are expected in late 2008, and will require adoption into the City's zoning ordinances by Spring 2009 [correction: the actual date is January 2, 2009]. The preliminary draft of the FIRM shows it is very similar to the current floodplain, only slightly more extensive along Hwy. 14, and most likely within the 300ft. wetland buffer. It was explained that the FIRMs are not field based but created using maps, which makes them rather general and 'murky', according to the consultant team. The WIDNR wetland maps on the other hand are field based, more rigorous, and carry stronger regulations.
Sanitary Sewer Service – confirming that service is not a constraint to neighborhood land-use planning at this time.
Analysis of Ecological Survey Results – The updated Field Collected Data Map was handed-out and changes to it were reviewed. It was noted that the DNR agrees with this map. The Stream in Johnson Park was determined to be a non-navigable drainageway. The Swale in the north east corner of the study area (on the T.Wall Property) was also determined to be a non-navigable drainageway. There is no regulatory constraint on non-navigable drainageways (the distinction between non-navigable drainageways, intermittent streams, perennial streams, and navigable waterways has to do with who originally mapped it – only non-navigable drainageways have no associated regulatory constraint). A question was raised about how the South Branch of Swan Creek seems to be represented on the map twice (solid red and dotted blue). The dotted blue line is the original USGS data, which is now out-dated; the red line accurately represents the route of the stream. The distinction between high, moderate, and low restoration potential was also questioned. The restoration potential depends on the number of trees present, so a tree stand can be restorable even with very high amounts of invasive species present. The issue of making a connection between Johnson Park and the tree stand immediately to its south was raised and the consultants will advise on how this should be accomplished. The consultants indicated that development in close proximity to woodlands is not problematic, unlike with wetlands. It was noted that the Steering Committee needs to know the protection standard for tree stands.

Resource Issues to Conclude as part of growth model review include: open space reservations, buffer distances and uses within buffer areas, and tree and woodland protection standards. The consultants stated that they would introduce draft language in future meetings on use standards for reserved areas and other environmental features, including buffers and tree stand protections standards. A map showing the prime agricultural soils and infiltration was displayed, and it was noted that this area, for the most part, has good quality agricultural soils.

Upcoming Resource Studies – the consultants outlined what the next steps are: continuing review of off-site monitoring, confirmation and agreement on study area goals, field soils investigations, field drainage survey, conceptual stormwater management analysis, and performance standards and development design recommendations. The consultant team will be evaluating the feasibility of established environmental goals.

V. Feedback Regarding Natural Resource Investigation

- Are wildlife surveys being conducted?
  - No, not for specific species. We are doing assessments of wildlife habitats however.

- As you are assessing the potential for infiltration in the study, are you digging soil pits?
  - Yes, you have to dig 10 to 15 feet deep to ensure infiltration will be predictable.

VI. Meeting Closing – 8:20

Meeting closed by Ald. Jay Allen.
Next Neighborhood Summit will be held on January 19, 2008

Minutes
McGaw Park Neighborhood Plan
Neighborhood Summit
January 26, 2009

The Summit was convened at 5:30 p.m. on January 26, 2009.

McGaw Park Neighborhood Plan Chairman Jay Allen began the Summit by reviewing the public input gathered to date through two prior Summits, two public information sessions, and monthly Steering Committee meetings, in addition to presentations made at Plan Commission and the Council. He asked people to continue to participate in the plan.

Scott Goldstein of Teska Associates discussed the growth model, changes that have been made since the October meetings, and presented the intended uses of the various areas of the growth model. He summarized changes and additions to the plan, including adding buffers between residential and mixed use areas, He showed a conceptual drawing of the TOD area, including densities that would support a significant node at the location to support light rail. He also talked about planning for a neighborhood school either in the Madison district in the western portion of the neighborhood, or in the Institutional area shown in the plan which would be in the Oregon School District.

Jeff Kraemer of NRC reviewed field data that has been collected for the plan, including three identified wetlands, heritage and specimen trees, waterways, and buffers around wetlands. Steve Gaffield of Montgomery Associates presented stormwater, sanitary, and water supply findings and plans for the neighborhood.

Michael May of TAD discussed transportation recommendations, including planned roads in the neighborhood, and improvements that are planned including Interchange Road, Lacy Road, Fish Hatchery and Syene Roads.

The Summit then reconvened into three break-out sessions. Two sessions were held for each of the three issue areas: land use, environment, and transportation.

<u>Land Use breakout sessions</u>

- Questions were asked about LEED ND. Some residents stated that the goals of LEED ND were very important and would distinguish Fitchburg compared to its neighbors. Others wanted clarification whether LEED ND would be mandatory or an incentive. Others questioned if the neighborhood is too big for LEED. Goldstein responded that LEED ND does not require all buildings to be LEED certified. In fact, only one building would need to be LEED certified for the neighborhood to apply for LEED ND. And, once the area is a certified LEED ND area, developers and owners would receive additional points in LEED applications for individual buildings in the neighborhood.
- Questions about TOD. Some residents felt that there was too much density in TOD. Also a suggestion was added to include a park'n'ride along Fish Hatchery.
- Questions were asked about the permitted uses in the BP and Mixed Use areas. The Consultant Team will write up more specific ideas for review at the February 19 Steering Committee.

<u>Environmental breakout session</u>

- Tarpleywick resident – Concerned about timing of sanitary and water service to that existing neighborhood and costs residents will incur. This person recently invested in a new septic

system. We and Jay Allen discussed that it will likely be about a decade before water and sanitary are brought to Tarpleywick, which satisfied the questioner.

- Another Tarpleywick resident asked if there would be a buffer/transition between that existing neighborhood and the TOD area to the north. We explained that the plan includes this as an issue that must be addressed in individual development proposals, but detailed design of these transitions isn't typically included in a neighborhood plan. This response seemed satisfactory.
- There was discussion about phasing of water and sewer service (related mostly to the issue above). We'll try to show as much phasing of infrastructure as we can, but we and Jay Allen explained that not much detail on infrastructure will be included in this plan.
- Discussion with resident about rerouting the navigable (but dry) drainage swale that drains east from McGaw Park, through the Tarpleywick neighborhood, and across Syene RdSam Cooke (also on the RCC) said he appreciates the 300 ft buffer and the LEED-ND goals.
- Randy Christenson (Sveum Developments) doesn't want the push for LEED-ND certification to go beyond what's practicable.
- It was requested to review the WDNR Green Tier program (sort of a precertification program for development) vs. LEED-ND requirements.
- Resident living near Syene and Irish Lane is concerned about high groundwater and wet basements in recent years, and he asked if the Team is looking at whether development will make this worse. Mr. Kramer explained we're using the stormwater model to look at how flows in the south branch (through his neighborhood) and other streams will change – seemed satisfied.
- Randy Christiansen – asked the process to keep the Madison Area Builders Association "in the loop".
- Waterford Glen resident (NE of Tech Campus south of Lacy Rd) has a persistently wet basement.

<u>Transportation breakout session</u>

- The recommendation for 4-lanes on Fish Hatchery will be set in stone with the MPNP. In addition to burdening the cost to accommodate traffic through the City as opposed to within the City, the additional lanes will require mature trees to be taken down along the highway.
- How will connections occur to Mica south of Quarry Hill? What will buffer the neighborhood from the sight of the business park? Will the E-W roadway shown in the concept run along existing property lines or will there be a buffer between the road and property?
- Owners along Lacy Road wish to keep their access to Lacy Road, and in the case of the land owner in the NW corner of Lacy & Fahey Glen, provide an additional access to Lacy Road.
- Is the timeline for the MPNP realistic? What about the Hartung Property – what if it doesn't sell?
- Will eminent domain be used to make roadway connections and park annexations possible?
- Will the placement of a roundabout at Nobel & Lacy result in the need to take the property in the NE corner? Will the property lose its access?
- When will the rail be active?
- Please mention that, where trees and multi-use paths coincide, trees should win and the multi-use trails moved away from trees if necessary.
- We should plan for a connection south to Irish Lane – preferably to connect to Caine Road (Alderman 1); We should not plan for a connection south to Irish Lane (Alderman 2).

Minutes
McGaw Park Neighborhood Plan
Neighborhood Summit
February 19, 2009

The Summit was convened at 6:32 p.m. on February 19, 2009.

McGaw Park Neighborhood Plan Chairman Jay Allen began the Summit by reviewing the public input gathered to date through three prior Summits, two public information sessions, and monthly Steering Committee meetings, in addition to presentations made at Plan Commission and the Council. He asked people to continue to participate in the plan.

Ben Carlisle of Teska Associates gave the group a quick background of where the plan was in the process, highlighting that the plan is in the second draft phase and would hopefully be adopted by the Council in late spring/early summer. Since there was a neighborhood summit held a month ago, the consultant team noted that they were only going to highlight changes to environmental issues, land use and LEED, and transportation since the last neighborhood summit.

Steve Gaffield of Montgomery Associates presented stormwater, sanitary, and water supply findings and plans for the neighborhood. Steve discussed stormwater issues including infiltration, evapotranspiration, groundwater recharge, and "stay-on". Steve noted that the proposed standards will result in substantially greater stay-on and recharge than County ordinance. However, will also allow staff to use discretion to reduce requirements (e.g. where increased recharge could create flooding hazard).

Ben Carlisle highlighted changes in the Land Use Plan, noting that the only significant change was to classify uses in the Business Park. Those allowed uses included office, light manufacturing, lab space, and supportive commercial (business uses, restaurants, etc). Ben went on to note that development of the Business Park was intended to follow the LEED ND and sustainable development design parameters including reduction in infrastructure, impervious surface, and automobile dependence, providing connectivity, incorporation of green construction and technology, and application of Conservation Design practices where practical. Furthermore, to address concerns raised at the last neighborhood summit, the Land Use Plan outlines ways to reduce impacts upon adjacent uses including site orientation, building orientation, lighting, and landscaping and buffering. Lastly, Ben outlined the process to obtain LEED ND. The target for the neighborhood is 60 points. Based on initial review, a total of 60 points is possible. However, this won't be possible without a concerted partnership between the City, property owners, and developers.

Michael May of TAD discussed transportation recommendations, including planned roads in the neighborhood, and improvements that are planned including Interchange Road, Lacy Road, Fish Hatchery and Syene Roads. In addition, Michael presented road cross sections. The major road cross sections allow for bike lanes, sidewalks/trails, and on-street parking.

Opposed to prior Summits, the group stayed together and didn't break up.

Questions asked by the public included:

- Questions were asked about LEED ND, including who is behind it and if there are any other examples in Dane County. Some residents wanted clarification whether LEED ND would be mandatory or an incentive. Additionally some residents asked what the benefit of doing LEED ND is. Is there a financial benefit? Carlisle and Jay Allen responded that while no you don't receive any financial benefit in terms of getting money directly back, it has been shown that LEED ND leads to higher property values, lower utility costs, and higher quality of life. In addition, gaining LEED ND would signify Fitchburg as a regional leader in both design and environmental protection.

- There was a long discussion on the possibility of widening the ROW for Nobel Drive from 100' to 125'. The positives and negatives were discussed amongst the group and it was decided that all things considered it is best to keep Nobel Drive ROW at 100'.

- Concerns were raised about the proximity of Nobel Drive/Syene Road intersection, especially in relation to the existing single-family homes located to the north. Michael May noted that the buffer between that road and the residents would be around 75' and all efforts to shield and buffer the road (including berming, fencing, and landscaping) would be made. Concerns were raised regarding the stormwater runoff and the channel that flows through Johnson Park toward this intersection. Pat Cheney said he would like to see the channel improved and placed on Park land, rather than in an easement on private land. This kind of detail would have to be worked out at later stages of development.

- A question was asked regarding traffic impacts and that any additional traffic, especially on Irish Lane is not acceptable. Michael May noted that all efforts to move traffic efficiently through the neighborhood and region were being made and the goal is to have Nobel Road serve as the main east/west route, thus taking traffic pressure of Irish Lane and Lacy Road.

- A question was asked about sewers in this area. It was stated that the Plan recommends against sewers to the extent possible, encouraging infiltration. Some sewers are likely however, especially in the higher density TOD area.

The summit was adjourned at 8:04

Appendix 2B

Stakeholders Interviewed

Interviews were conducted with the following individuals:

Chris Armstrong, Fitchburg Technology Campus

Terry Carpenter, Resident

Patrick Cheney, Tarpleywick Hills

Randy Christianson, Coldwell Banker-Success Realty

Tracy Foss, Utility Project Engineer, City of Fitchburg

Paul Gramann, The Madison Group

Phyllis Hasbrook, Resident, Town of Dunne

Scott Kelly, Fitchburg Technology Campus

Kamran Mesbah, Capital Area Regional Planning Commission

Sean Robbins, T Wall Properties

Joe Rueden, East Fitchburg Neighborhood Association

Phil Sveum, Sveum Properties

Dennis Weidemann, Quarry Hill

Kris Wetzel, The Crossing/Waterford Glen

Paul Woodard, City of Fitchburg

Appendix 2C

McGaw Park Neighborhood Plan

LEED-ND Analysis

Based on the October 31, 2008 Draft
(1st Public Comment Draft)

LEED ND	Who?	Mechanisms and Policies		Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
SMART LOCATION							
Prerequisite 1: Smart Location	Option 4: Nearby Neighborhood Assets	City of Fitchburg		A map of the vicinity demonstrating that the project is located within .5 mile walk distance of at least 7 diverse uses. Map provided by City of Fitchburg	Prerequisite		
Prerequisite 2: Proximity to Water & Wastewater	Water and wastewater may not pass through open space portions to serve land beyond the project outside of the service area. Option 2.	City of Fitchburg		A map showing the planned water and wastewater service areas, and/or a letter from the relevant public authority stating that the project site lies within planned water and wastewater service areas. A brief narrative explaining the new infrastructure that the project team commits to providing or funding if the project is built. Documentation that water and wastewater service area has been expanded to serve McGaw would need to be provided after adoption of Neighborhood Plan.	Prerequisite		
Prerequisite 3: Imperiled Species and Ecological Communities	Option 1: No species present or likely	NRC / DNR		Results of inquiries to the state Natural Heritage Program and any local wildlife agencies as to whether listed endangered species or G1 or G2 ecological communities occur or have a high likelihood of occurring on the project site.	Prerequisite		
Prerequisite 4: Wetland and Water Body Conservation	Developed land is not considered wetlands, water bodies, or 100 foot buffer land	City of Fitchburg/ Regional Planning Commission (RPC)	RPC requires 100' buffer; City of Fitchburg, Plan requires 300' buffer		Prerequisite		
	Option 2: Sites with wetlands, water bodies, or land within 100 feet of these areas	City of Fitchburg / RPC	RPC requires 100' buffer; City of Fitchburg Plan requires 300' buffer	A site plan indicating the portion of the site that is impacted, and the location of any BMPs. A written commitment to incorporate BMPs within the impacted area to meet the requirements if the project is built. Earn one point under GIB Credit 7: Target of 80% of stormwater to be retained.	Prerequisite – utilize Option 2		

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Prerequisite 5: Agricultural Land Conservation	Locate site on a site that is not within a state or locally designated agricultural preservation district, unless any changes made to the site conform to the requirements for development within the district	Applicant / City of Fitchburg			Prerequisite	
	Option 5: Regions with more than 75% prime agricultural land	Applicant / City of Fitchburg		Data and/or a map showing that 75% of the total vacant land in the metropolitan or Metropolitan Statistical Area (or county) is covered by prime soils, unique soils, or soils of state significance. A site and/or vicinity map showing that the project site is an adjacent site.	Prerequisite	
Prerequisite 6: Floodplain avoidance	Option 3: All other sites - develop only on portions of the site that are not in a 100 year floodplain	Applicant / City of Fitchburg	Zoning code to prohibit building in floodplain	A site and/or vicinity map indicating where new development will take place, areas that are previously developed, and the boundaries of the 100-year floodplain. If any portion of the site that is being redeveloped lies within the 100-year floodplain, submit a brief narrative describing how the NFIP requirements will be met for that portion.	Prerequisite	
CREDITS - SMART LOCATION						
Credit 1	Pref. Locations Option 1: c) Adjacent site	City of Fitchburg		A map of the vicinity demonstrating that the project is located on an adjacent site	2	2	10

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 2	Brownfields Option 1: Brownfield	Applicant/ City/ WDNR		Confirmation of whether any part of the project site was determined contaminated by means of an ASTM E1903-97 Phase II Environmental Site Assessment or defined as a brownfield by a local, state, or federal agency. Narrative describing the site contamination and remediation efforts undertaken or to be undertaken by the project.	0	1	2
Credit 3	Reduced Automobile Dependence Option 1: Transit-served location	City/ Applicant/ Madison Metro	Development agreement	308 total trips for silver. 410 transit trips per week for gold. Provide a list of transit stops that lie within the specified walk distance of 50% of the project's dwelling units and business entrances. Light rail - 2 trips/ hr., 144 trips/wk Bus – 2 trips/hr., 144 trips/wk Private Shuttle – 20 - 122 trips /wk depending on silver versus gold. Trips/week: 308 = 1 point; 359 = 2 points	1	2	8
Credit 4	Bicycle Network and Storage	City of Fitchburg/ Applicant	City/TTC Development Agreement	A site and/or vicinity map illustrating compliance with the bicycle network and storage requirements.	1	1	1
Credit 5	Housing and Jobs Proximity Option 1: Projects with Affordable Component	City/ Applicant	Zoning		0	0	3
Credit 6	Steep Slope Protection	City/ Applicant	City of Fitchburg Zoning Code	Topographic drawings of the project site indicating slopes, any areas that are previously developed, and the areas planned for development or redevelopment. Plan illustrating no disturbance of slopes over 15%.	1	1	1
Credit 7	Site Design for Habitat or Wetland Conservation Option 3: Sites with Wetlands/water bodies	City/ Applicant		A site plan which delineates any water bodies, wetlands, and/or buffers in relation to the development footprint. A summary of the assessment of water body and wetland functions. A letter from the accredited land trust or relevant public agency stating that a transfer of land rights for the habitat and buffer has taken place or will.	1	1	1

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 8	Restoration of Habitat or Wetlands Restore 10% of development footprint	City/ Applicant	10% of current building footprint will be very small area that can be accommodated in buffers and/or McGaw Park expansion. A site plan showing areas of restoration. A list of plants to be used. A calculation comparing the size of the restored areas to the size of the development Footprint and compliance with credit 9.	1	1	1
Credit 9	Conservation Management of Habitat or Wetlands Create a long-term management plan	City/ Applicant	A copy or summary of the management plan, including identification of preparers, or a written commitment to create a management plan if the project is built. Create a guaranteed funding source for management.	1	1	1
NEIGHBORHOOD PATTERN & DESIGN						
NPD Prerequisite 1	Walkable Streets	City/ Applicant	Development Agreement	Plans illustrating that the functional entry of each building has a front façade that faces a public space, that at least 20% of all street frontages within the project have a min. building-height-to-street-width ratio of 1:3, and a continuous sidewalks are provided along both sides of 90% of the streets in the project area.	Prerequisite	
NPD Prerequisite 2	Compact Development Option 2: All other projects	City/ Applicant	Development Agreement	A site plan indicating densities. Residential areas to have a min. average density of 7 d.u./ ac. Non-residential areas to have a minimum average density of .5 FAR	Prerequisite	
NPD Prerequisite 3	Connected and Open Community Option 1: Projects with internal streets	City/ Applicant	Development Agreement	Site plans illustrating one through street every 800 feet. Internal street connectivity with at least 150 street intersection / square mile.	Prerequisite	
Credit 1	Walkable Streets	City/ Applicant	Zoning /Development Agreement	Provide plans Illustrating achievement of (10) of these (15) items. Applicants should have flexibility in choosing which design elements to utilize in each development in order to enhance diversity of building forms and design across neighborhood.	7 (10 of 15 items from list)	9 (12 of 15 items from list)	12

a. At least 80% of the total linear feet of street-facing building facades in the project are no more than 25 feet from the property line.
b. At least 50% the total linear feet of street-facing building facades in the project are no more than 18 feet from the property line.
c. At least 50% of the total linear feet of mixed use and non-residential street-facing building facades in the project are contiguous to the sidewalk.
d. Functional building entries occur at an average of 75 feet along non-residential or mixed use buildings or blocks.
e. Functional building entries occur at an average of 30 feet along non-residential or mixed use buildings or blocks.
f. All ground-level retail, service, and trade uses that face a public space have clear glass on at least 60% of their façades between 3 and 8 feet above grade.
g. No blank walls (without doors or windows) longer than 40% of a façade, or more than 50 feet occur along sidewalks.
h. Any ground-level retail, service, or trade windows must be kept open and visible (un-shuttered) at night, and this must be stipulated in CC&Rs or other binding documents.
i. On-street parking is provided on a minimum of 70% of both sides of all new and existing streets including the project side of bordering streets.
j. (very difficult) Continuous sidewalks, or equivalent provisions for walking, are provided along both sides of all streets within the project, including the project-side of streets bordering the project.
k. If the project has ground-floor dwelling units, at least 50% of those units must have an elevated finished floor no less than 24 inches above the sidewalk grade.
l. (very difficult) In non-residential or mixed use projects, 50% or more of the total number of office buildings include ground floor retail along 60% of the length of the street façade and 100% or more of mixed use buildings include ground floor retail, live/work, and/or ground floor dwelling units along at least 60% of the street level facade; and all businesses and/or other community services on the ground floor are accessible directly from sidewalks along a public space such as a street, square, paseo, or plaza, but not a parking lot.
m. (very difficult) At least 40% of all street frontages within the project, have a minimum building-height-to-street-width ratio of 1:3, or one foot of building height for every three feet of street width. Alleys are excluded. Pedestrian-only dedicated rights-of-way may be counted toward the 40% requirement, but 100% of such spaces must have a minimum building height-to-street width ratio of 1:1. Street frontages are measured in linear feet. Projects with bordering streetscape are only responsible for meeting their proportional share of the height-to-width ratio. Building height is measured to eaves, or to the top of the roof for a flat roof structure, and street width is measured façade-to-façade. For block frontages with multiple heights and/or widths, use average heights or widths weighted by each segment's linear share of total block distance.
n. 75% of new exclusively residential streets within the project are designed for a target speed of no more than 20 mph.
o. 70% of new non-residential or mixed use streets within the project, are designed for a target speed of no more than 25 mph.

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 2 Compact Development Residential and Non-residential Density	City	Zoning Code	For 1 point achieve a residential density of more than 10 du/ac and less than or equal to 13 du/ac, and a non-residential density greater than .75 and less than 1.0 FAR. More points available for higher densities. A site plan indicating densities. For mixed-use projects, submit a calculation showing the points earned by the weighted average of residential and non-residential. A statement indicating the expected timeline for project construction and (for projects which have a residential component) which components of the project will be completed when 50% of the dwelling units are built.	0	1	6
Credit 3 Diversity of uses 4-6 uses, 3 uses in neighborhood center 7-10 uses, 5 in neighborhood center	Applicant	Development Agreement / Zoning Code	A calculation demonstrating that at least 25% of the project's built square footage is residential. A site and/or vicinity map of the vicinity showing the project's dwelling units and walking routes to any of the relevant uses defined below A table of walk distances between each dwelling unit and relevant uses defined below, and calculation of the percentage of dwelling units that lie within the specified distance. (50% of dwelling units within .5 mile walk distance) For any streets with speed limits greater than 25 miles per hour that intersect with walking routes to the relevant uses defined below, verify that vehicle traffic controls exist or will be installed at all walking route intersections. A statement indicating the expected timeline for project construction and which uses will be in place at the time the relevant percentages of occupancy are in place.	1 (4-6 uses, 3 uses in neighbor-hood center	2 (7-10 uses, 5 in neighbor-hood center)	4

				Retail Convenience store, Florist, Hardware store, Pharmacy, Supermarket, Other retail **Services** Bank, Coffee shop, Hair care, Health club, Laundry/dry cleaner, Medical/dental office, Restaurant , Homeless shelter, Civic/Community Facilities, Child care (licensed) **Civic/community center** Place of worship in a building Police/fire station Post office Public library Public park School Senior care, Social services facility			
Credit 4	Mixed-income Diverse Communities	Applicant / City of Fitchburg	Development Agreement	A site and/or vicinity map showing the location of different types of housing, either 1) within the project; or 2) within ¼ mile of the center of the project. The number of dwelling units in each category, the total number of dwelling units, and the results of the Simpson Diversity Index calculation. Confirmation of current HUD data regarding the area median income and the resulting maximum monthly rents. A table showing the number of affordable and market rate housing units, the rental prices of any affordable units, and a calculation of the percentage of rental units that are priced within the specified range. A copy of, or a written commitment to create a regulatory and operating agreement, deed restrictions, or other recorded document evidencing that the units will be maintained at the specified affordable levels for a minimum of 15 years.			7
	Option 1	Applicant	Development Agreement	A Simpson Diversity Index Score of greater than .5 and less than .6 = 1 pt. A Simpson Diversity Index Score of greater than or equal to .6 and less than .7 = 2 pt.	1	2	3

LEED ND		Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
	Option 2	Applicant	Development Agreement	For Home and Rentals Priced at up to 80% AMI: 20% of Total Rental Units / 8% of Total For Sale Units = 1pt 30% of Total Rental Units / 12% of Total For Sale Units = 2pts	1	2	3
	Option 3	Applicant		If projects earn at least two points in option 1 and two points in option 2 an additional point is earned	0	1	1
Credit 5	Reduced Parking Footprint No new off street parking or located at the rear / side No more that 20% of footprint for surface parking Provide bicycle parking for Multifamily, Retail, and commercial	Applicant	Development Agreement	A site plan indicating the location of all surface, underground, or multi-story parking facilities, including relevant carpool and bicycle spaces and carpool signage. For bicycle spaces provided for non-residential buildings, indicate the distance between the spaces and the entrance of the building they serve. The percentage of total development footprint that is used for surface parking facilities. The size of each individual parking lot that is part of the project, not larger than 2 acres. For any non-residential or multifamily residential buildings, submit the number of conventional automobile parking spaces, carpool spaces, and bicycle parking spaces that will be provided. Confirm that signage will be provided for carpool spaces equivalent to 10% of total spaces.	1	1	1
Credit 6	Street Network Pedestrian and bicycle connections at 90% of cul-de-sacs Connectivity (300 intersections / sq.mile)	City/ Applicant	Site Plan Review/ Development Agreement	A site plan indicating the location of any cul-de-sacs and pedestrian or bicycle through connections. A site plan and map of the vicinity showing the street grid density of the area within a ¼ mile radius of the center of the project site. A calculation of the street grid density within a ¼ mile radius of the center of the project site. A site plan showing the street grid density of the project site. A calculation of the street grid density of the project site. Connectivity of greater that 300 (intersection / sq.mile) and less than or equal to 400 = 1 pt. Connectivity of greater that 400 = 2 pt	0	1	2

LEED ND		Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 7	Transit Facilities/ Adequate Transit Service (308 trips per week) Illuminated shelter at each bus stop.	Madison Metro Transit / City/ Applicant	Agreement with Madison Metro, Development Agreement	A site plan showing the location of any transit stops within the project boundaries and any kiosks, bulletin boards, or signs with local transit information that will be provided as part of the project. A brief narrative listing the facilities for each transit stop that will be provided, including shelters, benches, and the mechanism for achieving the minimum light levels. A brief narrative describing the transit information that will be posted at kiosks, bulletin boards, or signs. Provide narrative describing adequate transit service	1	1	1
Credit 8	Transportation Demand Management	City/ Applicant	Development Agreement	For every two options below that are achieved 1 pt is acquired. For Gold Certification – provide documentation for achieving 2 of the options below Utilize options 2, 4 and 5: OPTION 1 - Create and implement a comprehensive transportation demand management (TDM) program for the project that reduces weekday peak period motor vehicle trips by at least 20% compared to the forecasted trip generation for the project without the TDM strategies; and fund for a minimum of three years following buildout of the project. OR OPTION 2 – TRANSIT PASSES Provide transit passes valid for at least one year, subsidized to be half of regular price or cheaper, to each resident, employee, and student locating within the project during the first three years of project occupancy (or longer). Publicize the fact that subsidized transit passes are available to project residents, employees, and students; OR OPTION 3 – DEVELOPER-SPONSORED TRANSIT Provide year-round, developer-sponsored transit service (with vans, shuttles, buses) from at least one central point in the project to rail, ferry, or other major transit facilities, and/or other major destinations such as a retail or employment center, with service no less frequent than 75% of adequate transit service. OR OPTION 4 – VEHICLE SHARING Locate the project such that 50% of the dwelling units and business entrances are within a ¼ mile walk distance of at least one vehicle in a vehicle-sharing program, and publicize the availability and benefits of the vehicle-sharing program to project occupants.	1	1	2

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
			OR OPTION 5 – UNBUNDLING OF PARKING For 100% of multifamily dwelling units, their associated parking spaces are sold or rented separately from the dwelling units.			
Credit 9	Access to public spaces Public space within ¼ mile of 90% of spaces	City/ Applicant	Development Agreement	A site and/or vicinity map showing 1) the location of all residential units and nonresidential building entrances; 2) the location, size, and proportions of all relevant parks; and 3) the walking routes between the project's buildings and relevant parks. A table of walk distances between each dwelling unit or non-residential building entrance and the closest relevant public space, and a calculation of the percentage of dwelling units and non-residential building entrances that lie within the specified distance. For projects larger than 7 acres, submit a calculation of the average size of parks (in acres) in the project.	1	1	1
Credit 10	Access to Active Public Space Active public facilities of at least 1 ac. are within ½ mile of 90% of dwelling units	Applicant	Development Agreement	A site and/or vicinity map showing 1) the location of all residential units and nonresidential building entrances; 2) the location and size of all relevant active open space facilities; and 3) the walking routes between the project's buildings and relevant facilities. A table of walk distances between each dwelling unit or non-residential building entrance and the closest relevant active open space facility, and a calculation of the percentage of dwelling units and non-residential building entrances that lie within the specified distance.	1	1	1
Credit 11	Universal Accessibility For each residential type, 20% to comply with FHAA	Applicant	Development Agreement	A brief narrative identifying the universal design or universal accessibility features of the project, and identifying any applicable provisions of the FHAA, Rehabilitation Act, and the ADA. Submit a site plan indicating the location of any units and paths of travel that comply with the applicable provisions of the FHAA and the Rehabilitation Act, and a calculation showing the percentage of each type of residential unit that complies with the applicable provisions.	1	1	1

Credit 12	Community Outreach and Involvement	City of Fitchburg	See evidence	Submit a written commitment to meet the requirements of the credit and a brief description as to how and when the activities are expected to take place. Provide a narrative describing the community outreach process with emphasis on the following: 1) some documentation that at least one public meeting was held (examples could include meeting fliers, agenda, minutes, invitation letters, photographs of the meeting, copies of meeting sign-in sheets); 2) a brief narrative and/or illustration demonstrating how community input influenced changes to the design or an explanation of why changes were not made; 3) at least one letter of support from a community association and/or social network stating that the project team worked directly to engage with the association or network to advertise and generate comments on the project; 4) a brief narrative describing the ongoing means of communication between developers and community during design, construction, and in cases where the developer maintains control of part or the entire project, after construction.	1	1	2
Credit 13	Local Food Production Establish CC&Rs Option1: Dedicate permanent growing space within project Option 2: Purchase shares in a Community Supported Agriculture Program Option 3: Locate the project within a ¼ mile walk distance of existing or planned farmer's market	Applicant / City of Fitchburg	Development Agreement	All Options: A copy of, or a written commitment to create, any necessary CC&Rs, development agreements, deed restrictions, or other binding documents that will establish that areas for growing produce are not prohibited as specified. **Option 1** A site plan showing the location and size of dedicated space for growing and/or related facilities. A calculation showing the required growing space based on density. A written commitment to provide the items specified if the project is built. A brief narrative explaining what entity will serve to own and manage the growing spaces and facilities. **Option 2** Identification of available CSA programs that can deliver to within ¼ mile of the project site according to the specified schedule, and an estimated cost for purchasing shares for 80% of the project's households for two years. A written commitment to purchase shares for 80% of the project's households for two years, if the project is built. **Option 3** A map showing the location of the relevant farmers' market in relation to the project.	1	1	1

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 14	Tree-Lined and Shaded Streets Street trees on both sides for 70% of streets AND/OR Shade structures over 40% of side walks on streets	Applicant	Development Agreement	Option 1 - Provide plans that illustrate the percentage of streets in the project that have trees on both sides and are spaced no more than 40' o.c. (Option 1 more attainable according to TAD) Option 2 - Provide plans that illustrate the percentage of streets that have shade structures over sidewalks.	1	2	2
Credit 15	Neighborhood Schools	Applicant	Development Agreement	Provide plan illustrating location of schools and percentage of dwelling units within 1/2 mile of site school, and legally binding commitment from school district. In case of elementary school, reduce area to 5 acres.	0	1	1
GREEN INFRASTRUCTURE AND BUILDINGS							
Prerequisite 1	One Certified Green Building	Applicant	LEED certification	Provide certification information on the building that is to be LEED certified.	Prerequisite		
Prerequisite 2	Minimum Building Energy Efficiency	Applicant	Development Agreement	A written commitment to meet the requirements of the credit, including a table listing each building and what compliance path is planned for the building, and a calculation showing the percentage of buildings that will be meeting the relevant requirements.	Prerequisite		
Prerequisite 3	Minimum Building Water Efficiency	Applicant	Development Agreement	An estimate of baseline indoor water use based on the type and number of buildings in the project. A written commitment to employ indoor water use reduction strategies to meet the requirements of the credit.	Prerequisite		
Prerequisite 4	Construction Activity Pollution Activity	Applicant	Development Agreement / City of Fitchburg Subdivision Code	A site plan indicating where erosion and sedimentation control will be necessary during construction. A written commitment that an ESC plan will be created and implemented if the project is built, or confirmation that local code requires the same provisions.	Prerequisite		

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 1	Certified Green Buildings	Applicant	Development Agreement	A calculation showing the percentage of square footage that will be LEED certified. 10%-20% of sq. ft. LEED certified = 1 point 20%-30% of sq. ft. LEED certified = 2 points	0	1	5
Credit 2	Building Energy Efficiency 90% of new buildings must be 24% better than ASHRAE 90.1-2007	Applicant	Development Agreement	A written commitment to meet the requirements of the credit as appropriate to the number of points attempted if the project is built, including a table listing each building and what compliance path is planned for the building, and a calculation showing the percentage of buildings that will be meeting the relevant requirements.	1	1	2
Credit 3	Water Efficient Landscaping – 50% potable water reduction	Applicant	Development Agreement	A site plan indicating areas of outdoor water use. A written commitment to employ outdoor water use reduction strategies to meet the requirements of the credit, including a list of strategies planned.	1	1	1
Credit 4	Existing Building Reuse 50% of one building or 20% of total building stock	Applicant	Development Agreement	A written commitment to maintain the percentage of building structure(s) to meet the requirements of the credit.	1	1	1
Credit 5	Historic Building Preservation and Adaptive Reuse	Applicant	Development Agreement	A document from the local government, the State Historic Preservation Officer, or the National Park Service stating the name and address of the property, its historic designation or status, and the date of designation. Other acceptable documents include a copy of the notice in the Federal Register or a verifiable copy of the web page of a state or national register that demonstrates the designation. A written commitment to incorporate and rehabilitate at least one historic building to meet the requirements of the credit.	1	1	1

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 6	Minimize Site Disturbance Option 2: Undeveloped portion of project remains undisturbed (15% - 20%)	Applicant	Development Agreement	All Options A site plan indicating the location of any areas that are previously developed, the development footprint of the project, and the zone of construction impact. Option 2 A calculation showing the residential and/or non-residential density of the project. A calculation of the percentage of the previously undeveloped areas that will be left undisturbed. Moraine Edge Park would be necessary to fulfill this calculation. A copy of, or a written commitment to create, any necessary CC&Rs, development agreements, or other binding documents that will protect the undisturbed area according to the relevant credit requirements.	1	1	1
Credit 7	Stormwater Management Implement a stormwater management plan	Applicant	Development Agreement	All Options A site plan indicating the project's development footprint, and the location of any planned stormwater management technologies or BMPs. A written commitment to develop and implement a comprehensive stormwater management plan to meet the requirements. Confirmation of type of watershed. Option 1 A site plan indicating previously developed areas (this can be done as part of the site plan listed above).			4
	Targeted % of storm events to be retained 80%				1	1	1
	85%				0	1	1

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 8	Heat Island Reduction 50% of non roof pavement to have shade, SRI of 29, or open grid 50% of off-street parking to be covered High reflectance roof or green roof	Applicant	Development Agreement	A site plan indicating the location of any non-roof areas that will be employing the heat island reduction technologies or strategies listed in the requirements. A written commitment to employ sufficient non-roof heat island reduction strategies to meet the requirements, if the project is built. A site plan indicating the location of any green roofs or roof areas that will have an SRI greater than or equal to those specified in the requirements. A written commitment to include a sufficient percentage of green roofs, or roofs with the specified SRI value to meet the requirements.	1	1	1
Credit 9	Solar Orientation Option 2: 75% of buildings within 15% of E/W	Applicant	Development Agreement	Option 2 A site plan indicating: 1) the axis of all relevant buildings and their degree relation to the geographical east/west axis; and 2) the length to width proportion of each relevant building. A cross section drawing showing any shading that would impact solar access for relevant buildings. A calculation of the percentage of buildings that have the required proportions and their long axis is within 15 degrees of geographical east/west axis.	0	1	1
Credit 10	On-Site Renewable Energy 5% to 20%	Applicant	Development Agreement	A written commitment to develop on-site energy generation system(s) to meet the requirements. For 1 pt – 5% of annual electrical and thermal energy cost to be on-site renewable.	0	1	3

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 11	District Heating & Cooling	Applicant	Development Agreement	A written commitment to develop a district heating and/or cooling system to meet the requirements	0	0	2
Credit 12	Infrastructure Energy Efficiency Lights, water pumps, and treatment to achieve 15% energy reduction	Applicant / Utility Companies	Development Agreement	A written commitment to meet the requirements for any of the specified infrastructure items used in the project.	1	1	1
Credit 13	Wastewater Management 25% of wastewater retained on site to replace potable water	City/ Applicant	Development Agreement	A written commitment to divert, treat as necessary, and reuse wastewater on site to meet the requirements	0	1	3
Credit 14	Recycled Content in Infrastructure Achieve 3 of 4	Applicant / Contractor	Development Agreement	A written commitment to meet the requirements for recycled content in the specified applications. (new roadways, parking lots, sidewalks, and curbs.)	1	1	1
Credit 15	Waste Management Infrastructure Signage on storm drains about what body of water drain leads to; Achieve four of the 5 requirements	Applicant / Contractor	Development Agreement	A site plan indicating the location of the drop-off points or stations and a written commitment to provide them if the project is built, or confirmation that the project site is located in a jurisdiction that provides services for collecting these materials, and a schedule or summary of those services. A written commitment to publicize the availability and benefits of the drop-off points or stations to project occupants. Confirmation that a plan for post-collection disposal or reuse of materials exists, or a written commitment to create one.	1	1	1

LEED ND	Who?	Mechanisms and Policies	Evidence / Submittals	Points for Cert.	Points for Silver	Possible Points
Credit 16	Light Pollution Reduction	Applicant	Development Agreement	A site plan indicating shared portions of the project, and relevant sources of lighting. Confirmation of which LZ (lighting zone) the project is located in.	1	1	1
				A written commitment to reduce light pollution from shared portions of the project to meet the requirements.			
				A copy of, or a written commitment to create, any necessary CC&Rs, development agreements, or other binding documents that will require continued adherence to these standards.			
INNOVATION AND DESIGN PROCESS							
Credit 1	Innovation and Exemplary Performance	Applicant	Development Agreement	The specific title for the ID credit, a statement of the credit intent, and a statement of credit requirements. A narrative (and site plan if necessary) describing the project's approach to achievement of the credit, including a description of the quantifiable benefits of the credit proposal.	3	3	5
				A written commitment to meet the requirements (stated by the project team as part of the submission requirement above) if the project is built.			
Credit 2	LEED Accredited Professional	LEED AP		The name, place of employment, and a brief description of the project role for the individual. Confirmation of whether the individual is a LEED Accredited Professional, credentialed with regard to smart growth, or credentialed with regard to new urbanism.	1	1	1
Credit 1	Regional Priority Credit				1	1	4
			Total		**43**	**60**	
			Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points				

Note: This is a preliminary analysis of LEED ND guidelines dated December, 2008. The guidelines are expected to change before final adoption. The analysis was conducted by Teska Associates, Inc., and is not a full application for certification.

Appendix 3A

McGaw Park Neighborhood Plan

Site Characterization

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June 11, 2008

Joshua Kapfer
Natural Resources Consulting, Inc.
119 South Main Street
Cottage Grove, WI 53527

SUBJECT: Endangered Resources Review (ERIR Log # 08-114)
Proposed McGaw Neighborhood data request, City of Fitchburg in Dane County, WI

Dear Mr. Kapfer,

The Bureau of Endangered Resources has reviewed the project area described in your review request received May 28, 2008 for the proposed McGaw Neighborhood data request, City of Fitchburg in Dane County, WI.

Our Natural Heritage Inventory (NHI) data files contain the following information for the project site located in T6N R9E Sections 14 & 15 in Dane County. In addition to the proposed project site, endangered resource information is provided for an area within one mile of the project's location (and two miles for aquatic species). This information is provided so impacts to nearby endangered resources can be assessed and to assist in determining which rare species may occur in the project's impact area. If the described habitat types exist in the project's impact area, then species that occur nearby may be present at the proposed location. Endangered resources documented within and around the project area include:

- **Shrub-carr** - This wetland community is dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), meadow-sweet (*Spiraea alba*), and various willows (*Salix discolor, S. bebbiana,* and *S. gracilis*). Canada bluejoint grass (*Calamagrostis canadensis*) is often very common. Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

- **Southern Sedge Meadow** - Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*). Common associates are water-horehound (*Lycopus uniflorus*), panicled aster (*Aster simplex*), blue flag (*Iris virginica*), Canada goldenrod (*Solidago canadensis*), spotted joe-pye-weed (*Eupatorium maculatum*), broad-leaved cat-tail (*Typha latifolia*), and swamp milkweed (*Asclepias incarnata*). Reed canary grass (*Phalaris arundinacea*) may be dominant in grazed and/or ditched stands. Ditched stands can succeed quickly to Shrub-Carr.

Our data files also contain historical records (generally, records that are 25 years old or older) of rare species known to occur within the vicinity of the project site. Unfortunately, the Bureau does not have more current survey information documenting the continued existence of this species in this area. These older records are included, however, as an indication of species which may occur in the project area if appropriate habitat still exists:

- **Giant yellow hyssop** (*Agastache nepetoides*), a plant listed as Threatened in Wisconsin, prefers woodlands and forest edges, thickets, and river margins. Flowering occurs from early June through mid-October. Optimal identification period is from mid-July to late September.
- **Pale-purple coneflower** (*Echinacea pallida*), a plant listed as Threatened in Wisconsin, prefers prairies and prairie remnants along roads and railroads. Blooming occurs from early June through mid-July. Optimal identification period is from early June to mid-August.
- **Slim-stem small-reedgrass** (*Calamagrostis stricta*), a plant of Special Concern in Wisconsin, prefers dry to moist dunes, barrens, and dolomite or sandstone ledges, mostly near the Great Lakes, and also calcareous wetlands. Blooming occurs throughout the month of June. Optimal identification period is from early July to late August.
- **Small white lady's slipper** (*Cypripedium candidum*), a plant listed as Threatened in Wisconsin, prefers calcareous wet fens and prairies. Blooming occurs from mid-May through mid-June. Optimal identification period is from mid-May through mid-June.

Endangered and Threatened species are provided protection under the Wisconsin Endangered Species Law (29.604 State Stats.). Special Concern (Watch) species are those about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become endangered or threatened.

Comprehensive endangered resource surveys have not been completed for the project area. As a result, our data files may be incomplete. The lack of additional known occurrences does not preclude the possibility that other endangered resources may be present. Occurrences of rare species are only in our NHI database if the site has been previously surveyed for that species or group during the appropriate season, and an observation was reported and entered into the database. As such, **absence of an NHI occurrence in a specific area should not be used to infer absence of rare species.** Evaluations of the possible presence of rare species on the project site should be based on whether suitable habitat for the species exists within the project area.

Follow-up Actions:

1. Because this residential development project covers a large area containing isolated areas wetlands and is located immediately adjacent Swan Creek, it is recommended that strict **erosion and siltation controls** be practiced surrounding these sensitive aquatic resources during the entire development period.
    a. If and when these procedures are implemented, please note that erosion control netting (also known as erosion control blankets, erosion mats or erosion mesh netting) used to prevent erosion during the establishment of vegetation can have detrimental effects on local snake and other wildlife populations. Plastic netting without independent movement of strands can easily entrap snakes moving through the area, leading to dehydration, desiccation, and eventually mortality. Netting that contains biodegradable thread with the "leno" or "gauze" weave (contains strands that are able to move independently) appears to have the least impact on snakes.
    b. A large number of the plant species and natural communities listed above are found in **wetland habitats**. I recommend avoiding all impacts to onsite wetlands, which should include installing erosion fencing around all disturbance areas. Avoiding all impacts to onsite wetlands will also avoid potential impacts to plant species.

2. There are **three plant species** that have been recorded within the project boundary that have Threatened status. Please note that all listed plant species that occur on public lands are protected under the Wisconsin Endangered Species Law (29.604 State Stats.). I recommend you try to avoid all impacts to these species by avoiding all areas of suitable habitat or conducting **surveys** to confirm presence or absence. Even though these plants are historic records it is very likely they may be present in the on-site woodlots, along railroads grades, or in wetlands that are within the project boundaries. Please contact our office for additional information on survey protocols if you suspect that suitable habitat for the plants exists within the project site.

3. **Slim-stem small-reedgrass** is a plant of Special Concern and has been recorded within the project boundaries and may occur in areas of suitable habitat such as wetlands. I recommend surveys be conducted for this species in areas of suitable habitat.

4. There are two natural communities, **Shrub-carr** and **Southern Sedge Meadow**, within the vicinity of the project area. These are both wetland communities and provide suitable habitat to support some of the species listed above. The Natural Heritage Inventory Program tracks examples of all types of Wisconsin's natural communities that are deemed significant because of their undisturbed condition, size, what occurs around them, or for other reasons. Natural communities may contain rare or declining species and their protection should be incorporated into the project design as much as possible. Consider incorporating buffers along the edges of these areas.

The specific location of endangered resources is sensitive information that has been provided to you for the analysis and review of this project. Exact locations should not be released or reproduced in any publicly disseminated documents.

This letter is for informational purposes and only addresses endangered resource issues. This letter does not constitute Department of Natural Resources authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the Department.

Please contact me at (608) 266-5241 if you have any questions about this information.

Sincerely,

Angela Engelman

Angela Engelman, ER/6
Endangered Resources Program

cc:
Cathy Bleser – SCR/Fitchburg
Jeff Schure – SCR/Fitchburg
Laura Madsen – SCR/Fitchburg

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NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **10**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **5**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Bromus inermis*	Grass,Smooth Brome	100	UPL(NI)
Shrub				
X	*Rhamnus cathartica*	Buckthorn,Common	15	FACU
X	*Cornus racemosa*	Dogwood,Grey	5	FACW-
X	*Rubus occidentalis*	Black-Cap	5	UPL(NI)
Tree				
X	*Acer negundo*	Box-Elder	30	FACW-
X	*Prunus serotina*	Cherry,Black	10	FACU

% Species that are OBL, FACW, or FAC (except FAC-): **33**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 / 20% = 20) S: 25% (50% = 12.5 / 20% = 5) T: 40% (50% = 20 / 20% = 8)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-17	1	10YR 3/2				Silt Loam
17-20	2	10YR 4/4				Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **11**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **5**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Shrub				
X	*Lonicera x bella*	Honeysuckle	15	UPL(NI)
X	*Vitis riparia*	Grape,River-Bank	5	FACW-
Tree				
	Prunus serotina	Cherry,Black	5	FACU
X	*Acer negundo*	Box-Elder	25	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **75**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 / 20% = 20) S: 20% (50 % = 10 / 20% = 4) T: 30% (50 % = 15 / 20% = 6)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **10**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-16	1	10YR 3/1	10YR 4/6	common	prominent	Silty Clay Loam
16-18	2	GLEY1 2.5/N				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface
Hydric Inclusions: No Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **12**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **6**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Cirsium arvense	Thistle,Creeping	1	FACU
X	*Bromus inermis*	Grass,Smooth Brome	100	UPL(NI)

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 101% (50% = 50.5 /20% = 20.2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 3/2				Silty Clay Loam
10-18	2	GLEY1 2.5/N				Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **13**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **6**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 / 20% = 20)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **1**
- Depth to Free Water in Pit(in.): **N/A**
- Depth to Saturated Soils(in.): **N/A**

Primary Wetland Hydrology Indicators
- [**X**] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-12	1	10YR 3/1	10YR 5/6	many	prominent	Silty Clay Loam
12-18	2	10YR 4/2	10YR 5/6	many	prominent	Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface
Hydric Inclusions: No Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **14**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upl. Ag. Field**
Station ID: **7**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
X				

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Active Agricultural Field.
Planted Vegetation, Zea mayes, not considered.

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Perched water table - likely a result of recent heavy rains.

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-8	1	10YR 2/1				Silty Clay Loam
8-18	2	10YR 4/2				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

Sample point approx. 6" higher in elevation than the wetland line.

NRC
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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **15**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wtld. Ag. Field**
Station ID: **7**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	1	FACW+
X	*Polygonum persicaria*	Thumb,Lady'S	2	FACW

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
Agricultural Field.
Field not planted (likely because of recent heavy rains).
H: 3% (50% = 1.5 / 20% = 0.06)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [**X**] FAC-Neutral test
- [**X**] Other (explain in remarks)

Remarks
Other: Evidence of Ponding.

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 2/1				Silty Clay Loam
10-14	2	10YR 4/2	10YR 4/1	common	faint	Silty Clay
14-30	3	10YR 4/2	10YR 5/6	common	prominent	Silty Clay
			10YR 4/1	common	faint	

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: A11 Depleted Below Dark Surface
Hydric Inclusions: Wacousta - Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **16**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upl. Ag. Field**
Station ID: **7**
Plot ID: C

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
X				

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Active Agricultural Field.
Planted Vegetation, Zea mayes, not considered.

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Ringwood**
Taxonomy: **Typic Argiudolls**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 3/2				Silty Clay Loam
10-18	2	10YR 2/1				Silty Clay Loam
18-22	3	10YR 4/2				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: No Match
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **17**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wtld. Ag. Field**
Station ID: **7**
Plot ID: D

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
X				

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Agricultural Field.
Field not planted (likely because of recent heavy rains).

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [ ] FAC-Neutral test
- [**X**] Other (explain in remarks)

Remarks

Other: Evidence of Ponding.

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 2/1	10YR 4/6	common	prominent	Silty Clay Loam
10-18	2	10YR 4/2	10YR 4/6	many	prominent	Silty Clay
			10YR 4/1	common	faint	

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks

1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F3 Depleted Matrix
Hydric Inclusions: Wacousta - Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present

[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **18**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland Swale**
Station ID: **8**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Taraxacum officinale	Dandelion,Common	10	FACU
	Festuca rubra	Fescue,Red	10	FAC-
	Phleum pratense	Timothy	10	FACU
	Cirsium arvense	Thistle,Creeping	5	FACU
X	*Poa pratensis*	Bluegrass,Kentucky	90	FAC-

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 125% (50% = 62.5 / 20% = 25)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks
Perched water table - likely a result of recent heavy rains.

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-12	1	10YR 3/1				Silty Clay Loam
12-18	2	10YR 4/1	10YR 5/6	many	prominent	Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: A11 Depleted Below Dark Surface
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **19**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **8**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	90	FACW+
Shrub				
X	*Rhamnus cathartica*	Buckthorn,Common	5	FACU
Tree				
X	*Acer negundo*	Box-Elder	5	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **66**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 90% (50% = 45 /20% = 18) S: 5% (50% = 2.5 / 20% = 1) T: 5% (50% = 2.5 / 20% = 1)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-18	1	10YR 4/1	10YR 5/6	many	prominent	Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F3 Depleted Matrix

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **2**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **1**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Bromus inermis*	Grass,Smooth Brome	100	UPL(NI)
Shrub				
X	*Cornus racemosa*	Dogwood,Grey	10	FACW-
Tree				
X	*Quercus macrocarpa*	Oak,Bur	5	FAC-
X	*Prunus serotina*	Cherry,Black	5	FACU

% Species that are OBL, FACW, or FAC (except FAC-): **25**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 /20% = 20) S: 10% (50% = 5 /20% = 2) T: 10% (50% = 5 /20% = 2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Kidder**
Taxonomy: **Typic Hapludalfs**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-18	1	10YR 3/2				Silt Loam
18-20	2	10YR 4/3				Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **20**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **9**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Rhamnus cathartica	Buckthorn,Common	10	FACU
	Geum canadense	Avens,White	5	FAC
X	*Pastinaca sativa*	Parsnip,Wild	30	UPL(NI)
X	*Poa pratensis*	Bluegrass,Kentucky	25	FAC-
X	*Urtica dioica*	Nettle,Stinging	20	FAC+
Shrub				
	Salix exigua	Willow,Sandbar	10	OBL
X	*Rhamnus cathartica*	Buckthorn,Common	50	FACU
X	*Lonicera x bella*	Honeysuckle	30	NI
Tree				
X	*Prunus serotina*	Cherry,Black	50	FACU

% Species that are OBL, FACW, or FAC (except FAC-): **20**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 90% (50% = 45 / 20% = 18) S: 90% (50% = 45 / 20% = 18) T: 50% = (50% = 25 / 20% = 10)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Sable**
Taxonomy: **Typic Endoaquolls**
Drainage Class: **Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 2/2				Silt Loam
10-16	2	10YR 4/4				Silty Clay Loam
16-20	3	GLEY1 2.5/N				Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: No Match
Other: NRCS Field Indicators of Hydric Soils: No Match

Natural Resources Consulting, Inc.

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **20**

Data Form
Routine Wetland Determination

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **21**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **9**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Geum canadense	Avens,White	5	FAC
	Alliaria petiolata	Mustard,Garlic	5	FAC
X	*Phalaris arundinacea*	Grass,Reed Canary	65	FACW+
Shrub				
X	*Salix exigua*	Willow,Sandbar	25	OBL

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 75% (50% = 37.5 / 20% = 15) S: 25% (50% = 12.5 / 20% = 5)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **10**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [**X**] Drift lines
- [**X**] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Sable**
Taxonomy: **Typic Endoaquolls**
Drainage Class: **Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-6	1	10YR 3/1				Silty Clay
6-18	2	10YR 4/1	10YR 5/6	many	prominent	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F3 Depleted Matrix

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **22**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **10**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Poa pratensis	Bluegrass,Kentucky	20	FAC-
	Asclepias syriaca	Milkweed,Common	5	UPL(NI)
	Vitis riparia	Grape,River-Bank	5	FACW-
	Cirsium arvense	Thistle,Creeping	1	FACU
X	*Bromus inermis*	Grass,Smooth Brome	90	UPL(NI)

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 121% (50% = 60.5 / 20% = 24.2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-12	1	10YR 3/2				Silt Loam
12-18	2	10YR 3/1				Silty Clay Loam
18-20	3	10YR 3/2				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydrix
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match.

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **23**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **10**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Solidago canadensis	Golden-Rod,Canada	10	FACU
	Pastinaca sativa	Parsnip,Wild	5	UPL(NI)
	Vitis riparia	Grape,River-Bank	5	FACW-
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Shrub				
X	*Cornus racemosa*	Dogwood,Grey	10	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 120% (50% = 60 / 20% = 24) S: 10% (50% = 5 / 20% = 2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 3/1				Silty Clay Loam 80% of Matrix
0-10	1	10YR 2/1				Silty Clay Loam 20% of Matrix
10-18	2	10YR 4/2	10YR 4/4	common	distinct	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F3 Depleted Matrix
Hydric Inclusions: Otter: Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **24**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **11**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Rubus occidentalis	Black-Cap	20	UPL(NI)
	Cirsium arvense	Thistle,Creeping	10	FACU
	Medicago lupulina	Medic,Black	5	FAC-
	Taraxacum officinale	Dandelion,Common	1	FACU
X	*Arctium minus*	Burdock, Common	50	UPL(NI)
X	*Solidago canadensis*	Golden-Rod,Canada	30	FACU
Tree				
X	*Quercus macrocarpa*	Oak,Bur	25	FAC-
X	*Prunus serotina*	Cherry,Black	15	FACU

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 116% (50% = 58 / 20% = 23.2) T: 40% (50% = 20 / 20% = 8)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Plano**
Taxonomy: **Typic Argiudolls**
Drainage Class: **Well Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-20	1	10YR 3/2				Silt Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **25**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **11**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Parthenocissus quinquefolia	Creeper,Virginia	20	FAC-
	Urtica dioica	Nettle,Stinging	10	FAC+
	Solanum dulcamara	Nightshade,Climbing	5	FAC
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Shrub				
X	*Rhamnus cathartica*	Buckthorn,Common	10	FACU
X	*Acer negundo*	Box-Elder	5	FACW-
X	*Lonicera x bella*	Honeysuckle	5	NI
Tree				
X	*Acer negundo*	Box-Elder	70	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **75**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 135% (50% = 67.5 / 20% = 27) S: 20% (50% = 10 / 20% = 4) T: 70% (50% = 35 / 20% = 14)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-6	1	10YR 3/1				Silty Clay Loam
6-18	2	10YR 3/1	10YR 5/6	many	prominent	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface
Hydric Inclusions: Otter - Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **26**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland Ag. Field**
Station ID: **12**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	5	FACW+
X	*Lemna minor*	Duckweed,Lesser	5	OBL
Tree				
X	*Populus deltoides*	Cotton-Wood,Eastern	10	FAC+

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks

Planted Vegetation - Zea Mayes - not considered.
H: 10% (50% = 5 / 20% = 2) T: 10% (50% = 5 / 20% = 2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **2**
- Depth to Free Water in Pit(in.): **Surface**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [**X**] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-28	1	10YR 3/1				Silty Clay Loam
28-30	2	10YR 2/1				Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present

[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **27**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland Ag. Field**
Station ID: **12**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Lemna minor*	Duckweed,Lesser	10	OBL
X	*Rumex crispus*	Dock,Curly	5	FAC+
X	*Polygonum persicaria*	Thumb,Lady'S	5	FACW

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks

Agricultural Field.
Field not planted (likely because of recent heavy rains).
H: 20% (50% = 10 / 20% = 4)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **2**
- Depth to Free Water in Pit(in.): **Surface**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [**X**] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Plano**
Taxonomy: **Typic Argiudolls**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-10	1	10YR 3/1				Silty Clay Loam
10-18	2	10YR 3/1	10YR 5/6	many	prominent	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **28**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **UPL Ag. Field**
Station ID: **12**
Plot ID: C

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
X				

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Planted Vegetation - Zea Mayes - not considered.

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Plano**
Taxonomy: **Typic Argiudolls**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-16	1	10YR 3/2				Silty Clay Loam
16-20	2	10YR 4/4				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **29**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **12**
Plot ID: D

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Phalaris arundinacea	Grass,Reed Canary	10	FACW+
X	*Poa pratensis*	Bluegrass,Kentucky	60	FAC-
X	*Lolium perenne*	Ryegrass,Perennial	30	FACU

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks

Vegetation Kept mowed. Adjacent unmowed areas dominated by Phalaris arundinacea.
H: 100% (50% = 50 / 20% = 20)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **2**
- Depth to Free Water in Pit(in.): **Surface**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [**X**] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-6	1	10YR 5/4				Gravelly Fill
6-10	2	10YR 3/1	10YR 5/6	common	prominent	Silty Clay Loam
10-18	3	10YR 4/1	10YR 5/6	many	prominent	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present

[**Yes**] This Data Point is a Wetland

Remarks

Problem Area/Atypical Situation: Vegetation kept mowed and soil profile contains fill. Professional judgement utilized to consider area wetland despite lacking dominant hydrophytic vegetation.

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **3**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **1**
Plot ID: C

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Solanum dulcamara	Nightshade,Climbing	5	FAC
	Geum canadense	Avens,White	1	FAC
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Shrub				
X	*Cornus racemosa*	Dogwood,Grey	25	FACW-
X	*Lonicera x bella*	Honeysuckle	20	UPL(NI)
Tree				
	Prunus serotina	Cherry,Black	5	FACU
	Salix alba	Willow,White	5	FACW
X	*Acer negundo*	Box-Elder	50	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **75**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 106% (50% = 51.5 / 20% = 21.2) S: 45% (50% = 22.5 / 20% = 9) T: 60% (50% = 30 /20% = 12)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **6**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-16	1	10YR 3/1	10YR 5/6	common	prominent	Silty Clay Loam
16-18	2	10YR 4/1	7.5YR 5/6	many	prominent	Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 - Redox Dark Surface
Hydric Inclusions: No match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **30**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **12**
Plot ID: E

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Lolium perenne*	Ryegrass,Perennial	30	FACU
X	*Poa pratensis*	Bluegrass,Kentucky	70	FAC-

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 / 20% = 20)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Elburn**
Taxonomy: **Aquic Argiudolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-16	1	10YR 2/1				Silt Loam pebbles

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks
Sample Point located on sholder of railroad.
Problem Area/Atypical Situation: Vegetation kept mowed and soil profile contains fill.

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **4**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **2**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Pastinaca sativa	Parsnip,Wild	10	UPL(NI)
	Poa pratensis	Bluegrass,Kentucky	10	FAC-
	Vitis riparia	Grape,River-Bank	5	FACW-
	Cirsium arvense	Thistle,Creeping	5	FACU
	Daucus carota	Queen Anne's Lace	5	UPL(NI)
	Trifolium pratense	Clover,Red	5	FACU+
	Phleum pratense	Timothy	5	FACU
	Taraxacum officinale	Dandelion,Common	1	FACU
X	*Bromus inermis*	Grass,Smooth Brome	85	UPL(NI)

% Species that are OBL, FACW, or FAC (except FAC-): **0**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 131% (50% = 65.5 / 20% = 26.2)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Kidder**
Taxonomy: **Typic Hapludalfs**
Drainage Class: **Well Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-4	1	10YR 3/2				Silt Loam
4-9	2	10YR 3/2	10YR 4/3	common	faint	Silt Loam
9-18	3	10YR 4/3				Silt Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Non-Hydric
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks

NRC
Natural Resources Consulting, Inc.

Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **5**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **2**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Cirsium arvense	Thistle,Creeping	5	FACU
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Tree				
X	*Acer negundo*	Box-Elder	25	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 105% (50% = 52.5 / 20% = 21) T: 25% (50% = 12.5 /20% = 5)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-8	1	10YR 3/2				Silt Loam
8-10	2	10YR 3/1				Silt Loam
10-18	3	10YR 3/1	10YR 5/6	many	prominent	Silt Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: No Match
Hydric Inclusions: Match - Otter

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **6**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upl. Ag. Field**
Station ID: **3**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
X				

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Active Agricultural Field.
Planted Vegetation, Zea mayes, not considered.

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **None**
- Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Virgil**
Taxonomy: **Udollic Endoaqualfs**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-6	1	10YR 2/2				Loam
6-18	2	10YR 4/4				Sandy Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual:
Other: NRCS Field Indicators of Hydric Soils
Hydric Inclusions: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

NRC
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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **7**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **3**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+

% Species that are OBL, FACW, or FAC (except FAC-): **100**

NOTE: Species in capital letters denote non-native species.

Remarks

H: 100% (50% = 50 /20% = 20)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **18**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [**X**] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Sable**
Taxonomy: **Typic Endoaquolls**
Drainage Class: **Poorly Drained**
[**X**] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-4	1	10YR 3/1				Silty Clay Loam
4-18	2	10YR 3/1	10YR 4/6	many	prominent	Silty Clay Loam

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [**X**] Listed on Local Hydric Soils List
- [**X**] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks

1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface.

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **8**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upland**
Station ID: **4**
Plot ID: A

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
	Cirsium arvense	Thistle,Creeping	5	FACU
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 105% (50% = 52.5 / 20% = 21)

Hydrology

[ ] Recorded Data (describe in remarks)
[ ] Stream, Lake, or Tide Gage
[ ] Aerial Photograph
[ ] Other (describe in remarks)

Field Observations:
Depth of Surface Water(in.): **None**
Depth to Free Water in Pit(in.): **None**
Depth to Saturated Soils(in.): **None**

Primary Wetland Hydrology Indicators
[ ] Inundated
[ ] Saturated in upper 12 inches
[ ] Water marks
[ ] Drift lines
[ ] Sediment deposits
[ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
[ ] Oxidized root channels
[ ] Water-stained leaves
[ ] Local soil survey data
[**X**] FAC-Neutral test
[ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Kidder**
Taxonomy: **Typic Hapludalfs**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-6	1	10YR 2/2				Silt Loam
6-18	2	10YR 4/2	10YR 4/6	common	prominent	Silt Loam

Hydric Soils Indicators
[ ] Histosol
[ ] Histic Epipedon
[ ] Sulfidic Odor
[ ] Probable Aquatic Moist Regime
[ ] Reducing Conditions
[**X**] Gleyed or Low-Chroma Colors
[ ] Concretions
[ ] High Organic % in Surface Layer in Sandy Soils
[ ] Organic Streaking in Sandy Soils
[ ] Listed on Local Hydric Soils List
[ ] Listed on National Hydric Soils List
[**X**] Other (explain in remarks)

Remarks
Soil profile appears to be mixed and disturbed.
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F3 Depleted Matrix

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**No**] Wetland Hydrology Present
[**No**] This Data Point is a Wetland

Remarks
Sample Point is located on a steep slope.

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **9**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**No**] Is the site significantly disturbed (Atypical Situation)?
[**No**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Wetland**
Station ID: **4**
Plot ID: B

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Phalaris arundinacea*	Grass,Reed Canary	100	FACW+
Tree				
X	*Acer negundo*	Box-Elder	30	FACW-

% Species that are OBL, FACW, or FAC (except FAC-): **100**
NOTE: Species in capital letters denote non-native species.

Remarks
H: 100% (50% = 50 / 20% = 20) T: 30% (50% = 15 /20% = 6)

Hydrology

[ ] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [ ] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **None**
- Depth to Free Water in Pit(in.): **12**
- Depth to Saturated Soils(in.): **Surface**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [**X**] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [**X**] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [**X**] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Radford**
Taxonomy: **Fluvaquentic Hapludolls**
Drainage Class: **Somewhat Poorly Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-16	1	10YR 3/1	10YR 4/6	common	prominent	Silty Clay Loam
16-18	2	GLEY1 2.5/N				Silty Clay

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [**X**] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [**X**] Other (explain in remarks)

Remarks
1987 Manual: Hydric Soil
Other: NRCS Field Indicators of Hydric Soils: F6 Redox Dark Surface.
Hydric Inclusions: No Match

Wetland Determination

[**Yes**] Hydrophytic Vegetation Present
[**Yes**] Hydric Soils Present
[**Yes**] Wetland Hydrology Present
[**Yes**] This Data Point is a Wetland

Remarks

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Data Form
Routine Wetland Determination

Job Number: **008-0106-01**
Town/Village/City: **City of Fitchburg**
Wetland Data Point: **P1**

Project/Site: **McGaw Park**
Applicant/Owner: **T. Wall Properties**
Investigator: **Jeff Kraemer**
[**Yes**] Do normal circumstances exist on the site?
[**Yes**] Is the site significantly disturbed (Atypical Situation)?
[**Yes**] Is the area a potential problem area?

Date: **July 02, 2008**
County: **Dane**
State: **WI**
Community ID: **Upl. Ag. Field**
Station ID:
Plot ID:

Vegetation

Dominant	Species	Common Name / CofC	% Cover	Indicator
Herbaceous				
X	*Zea mayes*	Corn	30	NI

% Species that are OBL, FACW, or FAC (except FAC-): **0**

NOTE: Species in capital letters denote non-native species.

Remarks

Active Agricultural Field.

Hydrology

[**X**] Recorded Data (describe in remarks)
- [ ] Stream, Lake, or Tide Gage
- [**X**] Aerial Photograph
- [ ] Other (describe in remarks)

Field Observations:
- Depth of Surface Water(in.): **NA**
- Depth to Free Water in Pit(in.): **>18**
- Depth to Saturated Soils(in.): **>18**

Primary Wetland Hydrology Indicators
- [ ] Inundated
- [ ] Saturated in upper 12 inches
- [ ] Water marks
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Drainage patterns in wetlands

Secondary Hydrology Indicators
- [ ] Oxidized root channels
- [ ] Water-stained leaves
- [ ] Local soil survey data
- [ ] FAC-Neutral test
- [ ] Other (explain in remarks)

Remarks

Soils

Unit Name: **Ringwood**
Taxonomy: **Typic Argiudolls**
Drainage Class: **Well Drained**
[ ] Field Observations match map

Depth (in.)	Hor.	Matrix Color	Mottle / 2nd Mottle Color	Abundance	Contrast	Texture, Structure, etc.
0-5	1	10YR 4/3				Silt Loam
5-12	2	10YR 3/2				Silt Loam
12-14	3	10YR 3/2	10YR 5/2	common	prominent	Silt Loam
14-18	4	10YR 4/4	10YR 5/2	common	prominent	Silty Clay Loam 60% of Matrix
14-18	4	10YR 3/2	10YR 5/2	common	prominent	Silty Clay Loam 40% of Matrix

Hydric Soils Indicators
- [ ] Histosol
- [ ] Histic Epipedon
- [ ] Sulfidic Odor
- [ ] Probable Aquatic Moist Regime
- [ ] Reducing Conditions
- [ ] Gleyed or Low-Chroma Colors
- [ ] Concretions
- [ ] High Organic % in Surface Layer in Sandy Soils
- [ ] Organic Streaking in Sandy Soils
- [ ] Listed on Local Hydric Soils List
- [ ] Listed on National Hydric Soils List
- [ ] Other (explain in remarks)

Remarks

1987 Manual: Non-Hyric
Other: NRCS Field Indicators of Hydric Soils: No Match

Wetland Determination

[**No**] Hydrophytic Vegetation Present
[**No**] Hydric Soils Present
[**No**] Wetland Hydrology Present

[**No**] This Data Point is a Wetland

Remarks

Wisconsin Department of Natural Resources

RAPID ASSESSMENT METHODOLOGY FOR EVALUATING WETLAND FUNCTIONAL VALUES

GENERAL INFORMATION

Name of Wetland/Owner: Wetland 1
Location: City of Fitchburg, Dane County, WI
Project Name: North McGaw Park Neighborhood Plan
Evaluator(s): Jeff Kraemer
Date(s) of Site Visit(s): July 2, 2008

Description of seasonality limitations of this inspection due to time of year of the evaluation and/or current hydrologic and climatologic conditions (e.g. after heavy rains, snow or ice cover, during drought year, during spring flood, during bird migration):

Wisconsin Wetlands Inventory classification:

Wetland Type (bold those that apply):

shallow open water	deep marsh	shallow marsh	seasonally flooded basin
bog	**floodplain forest**	alder thicket	sedge meadow
coniferous swamp	fen	**wet meadow**	**shrub-carr**
low prairie	lowland forest		

Estimated size of wetland in acres: **8.38 acres**

SUMMARY OF FUNCTIONAL VALUES

Based on the results of the attached functional assessment, rate the significance of each of the functional values for the subject wetland and check the appropriate box Complete the table as a summary.

Function	Significance				
	Low	Medium	High	Exceptional	N/A
Floral Diversity	**x**				
Wildlife Habitat		**x**			
Fishery Habitat		**x**			
Flood/Stormwater Attenuation		**x**			
Water Quality Protection			**x**		
Shoreline Protection		**x**			
Groundwater			**x**		
Aesthetics/Recreation/Education		**x**			

List any Special Features / Red Flags: Wetland Adjacent to ASNRI stream.

SITE DESCRIPTION

I. HYDROLOGIC SETTING

A. Describe the geomorphology of the wetland:

__Depressional (includes slopes, potholes, small lakes, kettles, etc.)
x Riverine
__Lake Fringe
__Extensive Peatland

B. Y **N** Has the wetland hydrology been altered by ditching, tiles, dams, culverts, well pumping, diversion of surface flow, or changes to runoff within the watershed (bold those that apply)?

C. **Y** N Does the wetland have an inlet, outlet, or **both** (bold those that apply)?

Wetland 1 is directly adjacent to an unnamed intermittent tributary that is likely considered to be a relatively permanent waterway and is identified on the 24k hydro layer mapped by USGS.

D. **Y** N Is there any field evidence of wetland hydrology such as buttressed tree trunks, adventitious roots, **drift lines**, water marks, water stained leaves, **soil mottling**/**gleying**, organic soils layer, or oxidized rhizospheres (bold those that apply)?

E. **Y** N Does the wetland have standing water, and if so what is the average depth in inches? **1"** Approximately how much of the wetland is inundated? _5__%

F. How is the hydroperiod (seasonal water level pattern) of the wetland classified?

_____Permanently Flooded

__**X**__Seasonally Flooded (water absent at end of growing season)

__**X**__Saturated (surface water seldom present)

_____Artificially Flooded

_____Artificially Drained

G. Y **N** Is the wetland a navigable body of water or is a portion of the wetland below the ordinary highwater mark of a navigable water body? List any surface waters associated with the wetland or in proximity to the wetland (note approximate distance from the wetland and navigability determination). Note if there is a surface water connection to other wetlands.

The wetland is adjacent to the South Branch of Swan Creek (navigable), and is connected via the creek to wetlands off the property across Highway 14.

II. VEGETATION

A. Identify the vegetation communities present and the dominant species.

	floating leaved community dominated by:
	submerged aquatic community dominated by:
	emergent community dominated by:
X	shrub community dominated by: **sandbar willow, red osier dogwood**
X	deciduous broad-leaved tree community dominated by: **box elder**
	coniferous tree community dominated by:
	open sphagnum mat or bog dominated by:
X	sedge meadow/wet prairie community dominated by: **reed canary grass**
	other (explain):

B. Other plant species identified during site visit:

Other species are listed on the USACE wetland delineation data sheets.

III. SOILS

A. SCS Soil Map classification: *Elburn silt loam, Radford silt loam, Sable silty clay loam, Virgil silt loam*

B. Field description: *See USACE wetland delineation data sheets.*

_____Organic (histosol)? If so, is it a muck or a peat?

__X__Mineral soil?

- **Mottling**, gleying, sulfidic materials, iron or manganese concretions, organic streaking (bold those that apply)?
- Soil Description: *See data sheets.*_____
- Depth of mottling/gleying: __0-6”_____
- Depth of A Horizon: ___18”_____
- Munsell Color of matrix and mottles: 10 YR 3/1 MAT and 10 YR 4/6 Mottles

IV. SURROUNDING LAND USES

A. What is the estimated area of the wetland watershed in acres?

Approximately 1,125 acres.

B. What are the surrounding land uses?

LAND-USE	ESTIMATED % OF WETLAND WATERSHED
Developed (lndustrial/Commercial/Residential)	**15%**
Agricultural/cropland	**75%**
Agricultural/grazing	
Forested	**5%**
Grassed recreation areas/parks	
Old field	
Highways or roads	**5%**
Other (specify)	

V. SITE SKETCH

See Figure III-B.

FUNCTIONAL ASSESSMENT

The following assessment requires the evaluator to examine site conditions that provide evidence that a given functional value is present and to assess the significance of the wetland to perform those functions. Positive answers to questions indicate the presence of factors important for the function. The questions are not definitive and are only provided to guide the evaluation. After completing each section, the evaluator should consider the factors observed and use best professional judgement to rate the significance. The ratings should be recorded on page 1 of the assessment.

Special Features / RED FLAGS

1. **Y** N Is the wetland in or adjacent to an area of special natural resource interest (NR 103.04, Wis. Adm. Code)? If so, check those that apply:

_____a. Cold water community as defined in 5. NR 102.04(3)(b), Wis. Adm. Code, (including trout streams, their tributaries, and trout lakes);
_____b. Lakes Michigan and Superior and the Mississippi River;
_____c. State or federal designated wild and scenic river;
_____d. Designated state riverway;
_____e. Designated state scenic urban waterway;
__Y__f. Environmentally sensitive area or environmental corridor identified in an area-wide water quality management plan, special area management plan, special wetland inventory study, or an advanced delineation and identification study;
_____g. Calcareous fen;
_____h. State park, forest, trail or recreation area;
_____i. State and federal fish and wildlife refuges and fish and wildlife management areas;
_____j. State or federal designated wilderness area;
_____k. Designated or dedicated state natural area;
_____l. Wild rice water listed in ch. NR 19.09, Wis. Adm. Code;
_____m. Surface water identified as an outstanding or exceptional resource water in ch. NR 102, Wis. Adm. Code.

2. **Y** N According to the Natural Heritage Inventory (Bureau of Endangered Resources) or direct observations, are there any rare, endangered, or threatened plant or animal species in, near, or using the wetland or adjacent lands? If so, list the species of concern:

An NHI review was conducted, and a vegetation survey was conducted. There were no rare, endangered, or threatened species observed in the study area.

3. Y **N** Is the project located in an area that requires a State Coastal Zone Management Plan consistency determination?

Floral Diversity

1. Y **N** Does the wetland support a variety of native plant species (i.e. not a monotypic stand of cattail or giant reed grass and/or not dominated by exotic species such as reed canary grass, brome grass, buckthorn, purple loosestrife, etc.)?

Wet meadow is primarily a monotypic stand of reed canary grass. Shrub-carr and floodplain forest communities are present in the complex but support a limited number of species.

2. Y **N** Is the wetland plant community regionally scarce or rare?

Wildlife and Fishery Habitat

1. List any species observed, evidenced (e.g. tracks, scat, nest/burrow, calls), or expected to utilize the wetland:

   Deer, rabbits, and various songbirds.

2. Y **N** Does the wetland contain a number of diverse vegetative cover types and a high degree of interspersion of those vegetation types?

3. Y **N** Is the estimated ratio of open water to cover between 30 and 70 percent? What is the estimated ratio?

4. **Y** **N** Does the surrounding upland habitat likely support a variety of animal species?

The surrounding upland is primarily agricultural fields along with a large grain operation facility. A portion of the surrounding habitat is remnant oak savannah, which would likely support a variety of animal species.

5. Y **N** Is the wetland part of or associated with a wildlife corridor or designated environmental corridor?

6. Y **N** Is the surrounding habitat and/or the wetland itself a large tract of undeveloped land important for wildlife that require large home ranges (e.g. bear, woodland passerines)?

7. **Y** N Is the surrounding habitat and/or the wetland itself a relatively large tract of undeveloped land within an urbanized environment that is important for wildlife?

Wetland lies within a stream corridor which lies within an agricultural area with a proposed neighborhood development.

8. Y **N** Are there other wetland areas near the subject wetland that may be important to wildlife?

9. Y **N** Is the wetland contiguous with a permanent waterbody or periodically inundated for sufficient periods of time to provide spawning/nursery habitat for fish?

10. **Y** N Can the wetland provide significant food base for fish and wildlife (e.g. insects, crustaceans, voles, forage fish, amphibians, reptiles, shrews, wild rice, wild celery, duckweed, pondweeds, watermeal, bulrushes, bur reeds, arrowhead, smartweeds, millets)?

11. Y **N** Is the wetland located in a priority watershed/township as identified in the Upper Mississippi and Great Lakes Joint Venture of the North American Waterfowl Management Plan?

12. Y **N** Is the wetland providing habitat that is scarce to the region?

Flood and Stormwater Storage/Attenuation

1. Y **N** Are there steep slopes, large impervious areas, or areas of severe overgrazing within the watershed (bold those that apply)?

2. **Y** N Does the wetland significantly reduce runoff velocity due to its size, **configuration**, braided flow patterns, or **vegetation type and density**?

Wetland 1 occupies a toeslope position and contains a dense, reed canary grass-dominated wet meadow community.

3. **Y** N Does the wetland show evidence of flashy water level responses to storm events (**debris marks;** erosion

lines, stormwater, inputs; channelized inflow**)**?

Flood and Stormwater Storage/Attenuation (Continued)

4. Y **N** Is there a natural feature or human-made structure impeding drainage from the wetland that causes backwater conditions?

5. **Y** N Considering the size of the wetland area in relation to the size of its watershed, at any time during the year is water likely to reach the wetland's storage capacity (i.e. the level of easily observable wetland vegetation)? (For some cases where greater documentation is required, one should determine if the wetland has capacity to hold 25% of the runoff from a 2 year-24 hour storm event.)

At the time of observation, adjacent agricultural fields were inundated.

6. **Y** N Considering the location of the wetland in relation to the associated surface water watershed, is the wetland important for attenuating or storing flood or stormwater peaks (i.e. is the wetland located in the mid or lower reaches of the watershed)?

Wetland 1 occupies a toeslope position.

Water Quality Protection

1. Y **N** Does the wetland receive overland flow or direct discharge of stormwater as a primary source of water (circle that which applies)?

Groundwater is the primary water source for Wetland 1.

2. **Y** N Do the surrounding land uses have the potential to deliver **significant nutrient** and/or **sediment loads** to the wetland**?**

Wetland 1 is adjacent to agricultural fields and occupies a toeslope position.

3. **Y** N Based on your answers to the flood/stormwater section above, does the wetland perform significant flood/stormwater attenuation (residence time to allow settling)?

4. **Y** N Does the wetland have significant vegetative density to decrease water energy and allow settling of suspended materials?

The wet meadow community is dense reed canary grass.

5. **Y** N Is the position of the wetland in the landscape such that run-off is held or filtered before entering a surface water?

6. Y **N** Are algal blooms, heavy macrophyte growth, or other signs of excess nutrient loading to the wetland apparent (or historically reported)?

Shoreline Protection

1. **Y** N Is the wetland in a lake fringe or riverine setting? If N0, STOP and enter "not applicable" for this function. If YES, then answer the applicable questions.

2. Y **N** Is the shoreline exposed to constant wave action caused by a long wind fetch or boat traffic?

3. Y **N** Is the shoreline and shallow littoral zone vegetated with submerged or emergent vegetation in the swash zone that decrease wave energy or perennial wetland species that form dense root mats and/or species that have strong stems that are resistant to erosive forces?

4. Y **N** Is the stream bank prone to erosion due to unstable soils, land uses, or ice floes?

5. **Y** N Is the stream bank vegetated with densely rooted shrubs that provide upper bank stability?

Groundwater Recharge and Discharge

1. **Y** N Related to discharge, are there observable (or reported) springs located in the wetland, physical indicators of springs such as marl soil, or vegetation indicators such as watercress or marsh marigold present that tend to indicate the presence of groundwater springs?

2. **Y** N Related to discharge, may the wetland contribute to the maintenance of base flow in a stream?

3. Y **N** Related to recharge, is the wetland located on or near a groundwater divide (e.g. a topographic high)?

Aesthetics/Recreation/Education and Science

1. **Y** N Is the wetland visible from any of the following kinds of vantage points: **roads**, public lands, houses, and/or **businesses**? (bold all that apply.)

2. **Y** N Is the wetland in or near any population centers?

Wetland 1 is near residential development.

3. Y **N** Is any part of the wetland in public or conservation ownership?

4. **Y** N Does the public have direct access to the wetland from **public roads** or **waterways**? (bold those that apply.)

The wetland parallels USH 41.

5. Is the wetland itself relatively free of obvious human influences, such as:

a.	**Y**	N	Buildings?	e.	**Y**	N	Pollution?
b.	Y	**N**	Roads?	f.	**Y**	N	Filling?
c.	**Y**	N	Other structures?	g.	**Y**	N	Dredging/draining?
d.	**Y**	N	Trash?	h.	Y	**N**	Domination by non-native vegetation?

6. Is the surrounding viewshed relatively free of obvious human influences, such as:

a. Y **N** Buildings?

b. Y **N** Roads?

c. **Y** N Other structures?

7. **Y** N Is the wetland organized into a variety of visibly separate areas of similar vegetation, color, and/or texture (including areas of open water)?

Wet meadow, shrub-carr, floodplain forest, and drainageway corridor.

8. **Y** N Does the wetland add to the variety of visibly separate areas of similar vegetation, color, and/or texture (including areas of open water) within the landscape as a whole?

9. Does the wetland encourage exploration because any of the following factors are present:

a. Y **N** Long views within the wetland?

b. **Y** N Long views in the viewshed adjacent to the wetland?

c. **Y** N Convoluted edges within and/or around the wetland border?

d. **Y** N The wetland provides a different (and perhaps more natural/complex) kind of environment from the surrounding land covers?

Aesthetics/Recreation/Education and Science (continued)

10. Y **N** Is the wetland currently being used for (or does it have the potential to be used for) the following recreational activities? (Check all that apply.)

Activity	**Current Use**	**Potential Use**
Nature study/photography		**x**
Hiking/biking/skiing		
Hunting/fishing/trapping		
Boating/canoeing		
Food harvesting		
Others (list)		

11. Y **N** Is the wetland currently being used, and/or does it have the potential for use for educational or scientific study purposes (bold that which applies)?

Wisconsin Department of Natural Resources

RAPID ASSESSMENT METHODOLOGY FOR EVALUATING WETLAND FUNCTIONAL VALUES

GENERAL INFORMATION

Name of Wetland/Owner: Wetland 2, Wetland 3
Location: City of Fitchburg, Dane County, WI
Project Name: North McGaw Park Neighborhood Plan
Evaluator(s): Jeff Kraemer
Date(s) of Site Visit(s): July 2, 2008

Description of seasonality limitations of this inspection due to time of year of the evaluation and/or current hydrologic and climatologic conditions (e.g. after heavy rains, snow or ice cover, during drought year, during spring flood, during bird migration):

Wisconsin Wetlands Inventory classification:

Wetland Type (bold those that apply):

shallow open water (Wetland 3)	deep marsh	**shallow marsh (Wetland 3)**	seasonally flooded basin
bog	floodplain forest	alder thicket	sedge meadow
coniferous swamp	fen	**wet meadow (Wetland 2)**	**shrub-carr (Wetland 2)**
low prairie	lowland forest		

Estimated size of wetland in acres: **0.92 acres (Wetland 2); 0.25 acres (Wetland 3)**

SUMMARY OF FUNCTIONAL VALUES

Based on the results of the attached functional assessment, rate the significance of each of the functional values for the subject wetland and check the appropriate box Complete the table as a summary.

Function	Significance				
	Low	Medium	High	Exceptional	N/A
Floral Diversity	**x**				
Wildlife Habitat		**x**			
Fishery Habitat					**x**
Flood/Stormwater Attenuation		**x**			
Water Quality Protection	**x**				
Shoreline Protection					**x**
Groundwater	**x**				
Aesthetics/Recreation/Education	**x**				

List any Special Features / Red Flags:

SITE DESCRIPTION

I. HYDROLOGIC SETTING

A. Describe the geomorphology of the wetland:

_X_ Depressional (includes slopes, potholes, small lakes, kettles, etc.)
___ Riverine
___ Lake Fringe
___ Extensive Peatland

B. **Y** N Has the wetland hydrology been altered by **ditching**, tiles, dams, **culverts**, well pumping, diversion of surface flow, or changes to runoff within the watershed (bold those that apply)?

Wetland 2 drains to the west via a culvert to an upland roadside ditch.

C. **Y** **N** Does the wetland have an inlet, **outlet**, or both (bold those that apply)?

Wetland 2 drains to the west via a culvert to an upland roadside ditch.
Wetland 3 does not have an inlet or outlet.

D. **Y** N Is there any field evidence of wetland hydrology such as buttressed tree trunks, adventitious roots, drift lines, water marks, water stained leaves, **soil mottling**/gleying, organic soils layer, or oxidized rhizospheres (bold those that apply)?

Wetland 2 soils met NRCS Field Indicator F6-Redox Dark Surface.
Wetland 3 soils were not observed because the majority of the wetland is permanently inundated.

E. **Y** N Does the wetland have standing water, and if so what is the average depth in inches? Approximately how much of the wetland is inundated?

Wetland 2 has an average water depth of 2", with 70% of the wetland inundated at the time of observation..
Wetland 3 has an average water depth of > 12", with 90% of the wetland inundated.

F. How is the hydroperiod (seasonal water level pattern) of the wetland classified?

__**X**__ Permanently Flooded – *Wetland 3*

__**X**__ Seasonally Flooded (water absent at end of growing season) – *Wetland 2*

__**X**__ Saturated (surface water seldom present) – *Wetland 2*

_____ Artificially Flooded

__**X**__ Artificially Drained – *Wetland 2 (drains to west via a culvert)*

G. Y **N** Is the wetland a navigable body of water or is a portion of the wetland below the ordinary highwater mark of a navigable water body? List any surface waters associated with the wetland or in proximity to the wetland (note approximate distance from the wetland and navigability determination). Note if there is a surface water connection to other wetlands.

II. VEGETATION

A. Identify the vegetation communities present and the dominant species.

X	floating leaved community dominated by: **duckweed (Wetland 3)**
	submerged aquatic community dominated by:
X	emergent community dominated by: **hybrid cattail, reed canary grass (Wetland 3)**
X	shrub community dominated by: **gray dogwood (Wetland 2)**
	deciduous broad-leaved tree community dominated by:
	coniferous tree community dominated by:
	open sphagnum mat or bog dominated by:
X	sedge meadow/wet prairie community dominated by: **reed canary grass (Wetland 2)**
X	other (explain): **farmed wetland dominated by drowned corn, duckweed, curly dock, and Lady's thumb (Wetland 2)**

B. Other plant species identified during site visit:

See USACE Wetland Data Sheets.

III. SOILS

A. SCS Soil Map classification: *Elburn silt loam (Wetland 2), Troxel silt loam (Wetland 3; inundated)*

B. Field description: *See USACE data sheets.*

_____Organic (histosol)? If so, is it a muck or a peat?

__X__Mineral soil?

- **Mottling**, gleying, sulfidic materials, iron or manganese concretions, organic streaking (bold those that apply)?
- Soil Description: *See data sheets in Appendix A.*_____
- Depth of mottling/gleying: __6-10" (Wetland 2)_____
- Depth of A Horizon: ___18" (Wetland 2)_____
- Munsell Color of matrix and mottles 10 YR 3/1 MAT and 10 YR 5/6 Mottles (Wetland 2)

IV. SURROUNDING LAND USES

A. What is the estimated area of the wetland watershed in acres?

40 acres (Wetland 2)
11 acres (Wetland 3)

B. What are the surrounding land uses?

LAND-USE	ESTIMATED % OF WETLAND WATERSHED
Developed (lndustrial/Commercial/Residential)	**5% (Wetland 3)**
Agricultural/cropland	**90% (Wetland 2); 35% (Wetland 3)**
Agricultural/grazing	
Forested	**55% (Wetland 3)**
Grassed recreation areas/parks	
Old field	
Highways or roads	**5% (Wetland 2); 5% (Wetland 3)**
Other (specify)	**5% railroad (Wetland 2)**

V. SITE SKETCH

See Figure III-B.

FUNCTIONAL ASSESSMENT

The following assessment requires the evaluator to examine site conditions that provide evidence that a given functional value is present and to assess the significance of the wetland to perform those functions. Positive answers to questions indicate the presence of factors important for the function. The questions are not definitive and are only provided to guide the evaluation. After completing each section, the evaluator should consider the factors observed and use best professional judgement to rate the significance. The ratings should be recorded on page 1 of the assessment.

Special Features / RED FLAGS

1. Y **N** Is the wetland in or adjacent to an area of special natural resource interest (NR 103.04, Wis. Adm. Code)? If so, check those that apply:

_____a. Cold water community as defined in 5. NR 102.04(3)(b), Wis. Adm. Code, (including trout streams, their tributaries, and trout lakes);
_____b. Lakes Michigan and Superior and the Mississippi River;
_____c. State or federal designated wild and scenic river;
_____d. Designated state riverway;
_____e. Designated state scenic urban waterway;
_____f. Environmentally sensitive area or environmental corridor identified in an area-wide water quality management plan, special area management plan, special wetland inventory study, or an advanced delineation and identification study;
_____g. Calcareous fen;
_____h. State park, forest, trail or recreation area;
_____i. State and federal fish and wildlife refuges and fish and wildlife management areas;
_____j. State or federal designated wilderness area;
_____k. Designated or dedicated state natural area;
_____l. Wild rice water listed in ch. NR 19.09, Wis. Adm. Code;
_____m. Surface water identified as an outstanding or exceptional resource water in ch. NR 102, Wis. Adm. Code.

2. Y **N** According to the Natural Heritage Inventory (Bureau of Endangered Resources) or direct observations, are there any rare, endangered, or threatened plant or animal species in, near, or using the wetland or adjacent lands? If so, list the species of concern:

An NHI review was conducted, and a vegetation survey was conducted on the site. There were no rare, endangered, or threatened species observed in the area.

3. Y **N** Is the project located in an area that requires a State Coastal Zone Management Plan consistency determination?

Floral Diversity

1. Y **N** Does the wetland support a variety of native plant species (i.e. not a monotypic stand of cattail or giant reed grass and/or not dominated by exotic species such as reed canary grass, brome grass, buckthorn, purple loosestrife, etc.)?

Wetland 2 is dominated by reed canary grass, weedy species, and gray dogwood. Wetland 3 is an excavated pond with an emergent community fringe dominated by hybrid cattail and reed canary grass.

2. Y **N** Is the wetland plant community regionally scarce or rare?

Wildlife and Fishery Habitat

1. List any species observed, evidenced (e.g. tracks, scat, nest/burrow, calls), or expected to utilize the wetland:

   Deer, rabbits, and various songbirds.

2. Y **N** Does the wetland contain a number of diverse vegetative cover types and a high degree of interspersion of those vegetation types?

3. Y **N** Is the estimated ratio of open water to cover between 30 and 70 percent? What is the estimated ratio?

Wetland 3 exceeds this percentage with approximately 90% open water. The depth of water in Wetland 2 was approximately 2 inches, and likely seasonal and attributed to recent heavy rains.

4. **Y** N Does the surrounding upland habitat likely support a variety of animal species?

Wetland 2: the surrounding upland area is all agricultural fields, and does not likely support a variety of animal species.
Wetland 3: the surrounding upland is remnant oak savanna, and likely does support a variety of animal species.

5. Y **N** Is the wetland part of or associated with a wildlife corridor or designated environmental corridor?

6. Y **N** Is the surrounding habitat and/or the wetland itself a large tract of undeveloped land important for wildlife that require large home ranges (e.g. bear, woodland passerines)?

7. Y **N** Is the surrounding habitat and/or the wetland itself a relatively large tract of undeveloped land within an urbanized environment that is important for wildlife?

8. Y **N** Are there other wetland areas near the subject wetland that may be important to wildlife?

9. Y **N** Is the wetland contiguous with a permanent waterbody or periodically inundated for sufficient periods of time to provide spawning/nursery habitat for fish? (Wetland 3 is permanently inundated)

10. **Y** N Can the wetland provide significant food base for fish and wildlife (e.g. insects, crustaceans, voles, forage fish, amphibians, reptiles, shrews, wild rice, wild celery, **duckweed**, pondweeds, watermeal, bulrushes, bur reeds, arrowhead, smartweeds, millets)?

Wetland 3 is an excavated pond with substantial duckweed cover on the surface.

11. Y **N** Is the wetland located in a priority watershed/township as identified in the Upper Mississippi and Great Lakes Joint Venture of the North American Waterfowl Management Plan?

12. Y **N** Is the wetland providing habitat that is scarce to the region?

Flood and Stormwater Storage/Attenuation

1. Y **N** Are there steep slopes, large impervious areas, or areas of severe overgrazing within the watershed (bold those that apply)?

2. Y **N** Does the wetland significantly reduce runoff velocity due to its size, configuration, braided flow patterns, or vegetation type and density?

3. Y **N** Does the wetland show evidence of flashy water level responses to storm events (debris marks**;** erosion lines, stormwater, inputs; channelized inflow**)**?

Flood and Stormwater Storage/Attenuation (Continued)

4. **Y** N Is there a natural feature or human-made structure impeding drainage from the wetland that causes backwater conditions?

The railroad bed impedes drainage to some extent in Wetland 2. Wetland 3 is an excavated pond with no inlet or outlet.

5. **Y** N Considering the size of the wetland area in relation to the size of its watershed, at any time during the year is water likely to reach the wetland's storage capacity (i.e. the level of easily observable wetland vegetation)? (For some cases where greater documentation is required, one should determine if the wetland has capacity to hold 25% of the runoff from a 2 year-24 hour storm event.)

At the time of observation, Wetland 2 had drowned crops on the periphery.

6. **Y** N Considering the location of the wetland in relation to the associated surface water watershed, is the wetland important for attenuating or storing flood or stormwater peaks (i.e. is the wetland located in the mid or lower reaches of the watershed)?

Wetlands 2 and 3 are both located in the lower reaches of their respective watersheds. Wetland 3 is an excavated pond.

Water Quality Protection

1. **Y** N Does the wetland receive **overland flow** or direct discharge of stormwater as a primary source of water (circle that which applies)?

Overland flow is the primary source of water for Wetlands 2 and 3.

2. **Y** N Do the surrounding land uses have the potential to deliver **significant nutrient** and/or **sediment loads** to the wetland**?**

Wetlands 2 and 3 are both adjacent to agricultural fields and occupy lower slope positions in the landscape.

3. **Y** N Based on your answers to the flood/stormwater section above, does the wetland perform significant flood/stormwater attenuation (residence time to allow settling)?

4. Y **N** Does the wetland have significant vegetative density to decrease water energy and allow settling of suspended materials?

The majority of Wetland 2 is not densely vegetated, while the majority of Wetland 3 is open water.

5. Y **N** Is the position of the wetland in the landscape such that run-off is held or filtered before entering a surface water?

6. **Y** N Are algal blooms, **heavy macrophyte growth**, or other signs of excess nutrient loading to the wetland apparent (or historically reported)?

Wetland 3 has a dense cover of duckweed on the excavated pond surface.

Shoreline Protection

1. Y **N** Is the wetland in a lake fringe or riverine setting? If N0, STOP and enter "not applicable" for this function. If YES, then answer the applicable questions.

2. Y **N** Is the shoreline exposed to constant wave action caused by a long wind fetch or boat traffic?

3. Y **N** Is the shoreline and shallow littoral zone vegetated with submerged or emergent vegetation in the swash zone that decrease wave energy or perennial wetland species that form dense root mats and/or species that have strong stems that are resistant to erosive forces?

4. Y **N** Is the stream bank prone to erosion due to unstable soils, land uses, or ice floes?

5. Y **N** Is the stream bank vegetated with densely rooted shrubs that provide upper bank stability?

Groundwater Recharge and Discharge

1. Y **N** Related to discharge, are there observable (or reported) springs located in the wetland, physical indicators of springs such as marl soil, or vegetation indicators such as watercress or marsh marigold present that tend to indicate the presence of groundwater springs?

2. Y **N** Related to discharge, may the wetland contribute to the maintenance of base flow in a stream?

3. Y **N** Related to recharge, is the wetland located on or near a groundwater divide (e.g. a topographic high)?

Aesthetics/Recreation/Education and Science

1. **Y** N Is the wetland visible from any of the following kinds of vantage points: roads, public lands, **houses**, and/or businesses? (bold all that apply.)

2. **Y** N Is the wetland in or near any population centers?

Wetlands 2 and 3 are near residential developments.

3. Y **N** Is any part of the wetland in public or conservation ownership?

4. **Y** N Does the public have direct access to the wetland from **public roads** or waterways? (bold those that apply.)

Wetlands 2 and 3 are both adjacent to roads.

5. Is the wetland itself relatively free of obvious human influences, such as:

a.	Y	**N**	Buildings?	e.	**Y**	N	Pollution?
b.	Y	**N**	Roads?	f.	**Y**	N	Filling?
c.	**Y**	N	Other structures?	g.	**Y**	N	Dredging/draining?
d.	**Y**	N	Trash?	h.	Y	**N**	Domination by non-native vegetation?

6. Is the surrounding viewshed relatively free of obvious human influences, such as:

a. Y **N** Buildings?

b. Y **N** Roads?

c. **Y** N Other structures?

7. Y **N** Is the wetland organized into a variety of visibly separate areas of similar vegetation, color, and/or texture (including areas of open water)?

8. **Y** N Does the wetland add to the variety of visibly separate areas of similar vegetation, color, and/or texture (including areas of open water) within the landscape as a whole?

9. Does the wetland encourage exploration because any of the following factors are present:

a. Y **N** Long views within the wetland?

b. Y **N** Long views in the viewshed adjacent to the wetland?

c. Y **N** Convoluted edges within and/or around the wetland border?

d. **Y** N The wetland provides a different (and perhaps more natural/complex) kind of environment from the surrounding land covers?

Aesthetics/Recreation/Education and Science (continued)

10. Y **N** Is the wetland currently being used for (or does it have the potential to be used for) the following recreational activities? (Check all that apply.)

Activity	**Current Use**	**Potential Use**
Nature study/photography		
Hiking/biking/skiing		
Hunting/fishing/trapping		
Boating/canoeing		
Food harvesting		
Others (list)		

11. Y **N** Is the wetland currently being used, and/or does it have the potential for use for educational or scientific study purposes (bold that which applies)?

Community 1.JPG

Community 2.JPG

Community 3.JPG

Community 4.JPG

Community 5.JPG

Community 6.JPG

Community 7.jpg

Waterway 1 - Non-Navigable Drainage View West.jpg

Waterway 2 - Non-Navigable Drainage View East.jpg

Waterway 3 - Non-Navigable Drainage View Northeast.jpg

Waterway 3 - Non-Navigable Drainage View Southwest.jpg

Waterway 4 - Non-Navigable Stream View Northwest.jpg

Waterway 4 - Non-Navigable Stream View South.jpg

Waterway 5 - Non-Navigable Drainage Swale View South.jpg

Waterway 6 - Non-Naviable Drainage Swale View Southwest.jpg

Waterway 6 - Non-Navigable Drainage Swale View East.jpg

Waterway 7 - Navigable Stream (S. Branch Swan Creek).jpg

Waterway 7 - Navigable Stream View South.jpg

Wetland 1.jpg

Wetland 2.JPG

Wetland 3.JPG

Stream Habitat Assessment: Photos of Sampling Sites

South Branch Swan Creek

Stream Habitat Assessment: Photos of Sampling Sites

Swan Creek / ‘Lalor Road’ site

Stream Habitat Assessment: Photos of Sampling Sites

Murphy's Creek site

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
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August 21, 2008 INF-SC-2008-13-67907/69951-69956

Charles Bauer
Natural Resources Consulting
209 Commerce Pkwy; PO BOX 128
Cottage Grove, WI 53527

RE: Request for Navigability Determination for Unnamed Waterways, located in the McGaw Neighborhood, City of Fitchburg, Dane County, Sections 14 & 15, T6N, R9E.

Dear Mr. Bauer:

This letter is in response to your request for a navigability determination on the subject streams in the McGaw Neighborhood, City of Fitchburg, Dane County. I visited this site with you on 6/26/2008. In Wisconsin, the Supreme Court has defined a navigable waterway as one which has a defined bed and banks and carries enough water to float a canoe or other watercraft during the spring high water periods. Based on this definition and the conditions observed at your site, the navigability/public ownership of waterways on this property (as located on the enclosed map) have been determined as follows:

INF-SC-2008-13-67907 = Site 1, SE Q of NW Q, Sec. 15, T6N, R9E - This waterway does not have a Waterbody Identification Code (WBIC) and does not appear on the DNR Watershed Surface Water Viewer. It was determined to be non-navigable.

INF-SC-2008-13-69951 = Site 2, NE Q of SW Q, Sec. 15, T6N, R9E – This waterway does not have a WBIC and does not appear on the DNR Watershed Surface Water Viewer. It was determined to be non-navigable.

INF-SC-2008-13-69952 = Site 3, NW Q of SE Q, Sec. 15, T6N, R9E and NE Q and Sec. 15, T6N R9E - Headwaters of WBIC 803800, Swan Creek. This waterway is non-navigable to the west of the point on the map. The point of navigability was determined by DNR Water Management Specialist, and is documented in INF-SC-2008-13-4020LR.

INF-SC-2008-13-69953 = Site 4, SE Q of NW Q, Sec. 14, T6N, R9E – This waterway does not have a WBIC and does not appear on the DNR Watershed Surface Water Viewer. It was determined to be non-navigable.

INF-SC-2008-13-69954 = Site 5, NW Q of NE Q, Sec. 14, T6N, R9E - This waterway does not have a WBIC and does not appear on the DNR Watershed Surface Water Viewer. It was determined to be non-navigable.

INF-SC-2008-13-69955 = Site 6, NE Q of NE Q, Sec. 14, T6N, R9E – This waterway does not have a WBIC and does not appear on the DNR Watershed Surface Water Viewer. It is a grassed waterway draining to WBIC 5036636, to E edge of Sec 14. This waterway was determined to be non-navigable.

INF-SC-2008-13-69956 = Site 7 (SE Q of NE Q, and NW and SW Q of SE Q, Sec. 14, T6N, R9E, WBIC 5036636) – This waterway has a defined bed and banks and sufficient water to float a small watercraft. It is navigable.

Chapter 30, Wis. Stats., permits are needed for work in and near the waterways determined to be navigable. Information on these regulations and application materials are available on the DNR web site at www.dnr.wi.gov.

Certain activities may also require permits from Dane County and you should contact that agency before beginning any construction at this site.

If you have any questions about these determinations, please call Cami Peterson at (608) 275-3208.

Sincerely,

Cami Peterson

Donna Sefton ← for
Water Management Specialist

cc: Jeff Schure, DNR Water Management Specialist
Cami Peterson, DNR Water Management Specialist
Dane County Zoning Administrator
Dane County Land and Water Resources
Tom Hovel - Fitchburg

North McGaw Park Neighborhood Plan
Wildlife Species Potentially Occurring in the Study Area

REPTILES AND AMPHIBIANS	
Common Name	**Scientific Name**
Northern Brown Snake	*Storeria dekayi*
Northern Red Bellied Snake	*Storeria occipitomaculata*
Eastern Plains Garter Snake	*Thamnophis radix radix*
Common Garter Snake	*Thamnophis sirtalis*
Western Fox Snake	*Elaphe vulpina vulpina*
Eastern Milk Snake	*Lampropeltis triangulum*
Blue Spotted Salamander	*Ambystoma laterale*
Eastern Tiger Salamander	*Ambystoma tigrinum tigrinum*
American Toad	*Bufo americanus*
Gray Tree Frog	*Hyla versicolor*
Wood Frog	*Rana sylvantica*
BIRDS	
Common Name	**Scientific Name**
Wood Duck	*Aix sponsa*
Turkey Vulture	*Cathartes aura*
Cooper's Hawk	*Accipiter cooperli*
Sharp-Shinned Hawk	*Accipiter striatus*
Red Tailed Hawk	*Buteo jamaicensis*
Broad-Winged Hawk	*Buteo platypterus*
Wild Turkey	*Meleagris gallopavo*
Mourning Dove	*Zenaida macroura*
Yellow Billed Cuckoo	*Coccyzus americanus*
Black Billed Cuckoo	*Coccyzus erythropthalmus*
Screech Owl	*Otus asio*
Great Horned Owl	*Bubo virginianus*
Barred Owl	*Strix varia*
Saw-Whet Owl	*Aegolius acadicus*
Whip-Poor-Will	*Caprimulgus vociferus*
Common Nighthawk	*Chordeiles minor*
Chimney Swift	*Chaetura pelagica*
Ruby-Throated Hummingbird	*Archilochus colubris*
Common Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Red Bellied Woodpecker	*Melanerpes carolinus*
Yellow Bellied Sapsucker	*Sphyrpicus varius*
Harry Woodpecker	*Picoides villosus*
Downy Woodpecker	*Picoides pubescens*
Great Crested Flycatcher	*Myiarchus crinitus*
Eastern Phoebe	*Sayomis phoebe*
Least Flycatcher	*Empidonax minimum*
Eastern Wood-Pewee	*Conopus virens*
Tree Swallow	*Iridoprocne bicolor*
Rough Winged Swallow	*Stelgidopteryx ruficollis*
Blue Jay	*Cyanocitta cristata*
Cornmon Crow	*Corvus brachryhynochos*

North McGaw Park Neighborhood Plan
Wildlife Species Potentially Occurring in the Study Area

BIRDS	
Common Name	**Scientific Name**
Black Capped Chickadee	*Parus atricapillus*
Tufted Titmouse	*karus bicolor*
White Breasted Nuthatch	*Sitta carolinensis*
Brown Creeper	*Certhia familiaris*
House Wren	*Troglodytes aedon*
Gray Catbird	*Dumetella carolinensis*
Brown Thrasher	*Toxostoma rulum*
Robin	*Turdus migratorius*
Wood Thrush	*Hylocichla mustelina*
Veery	*Catharus fuscenscens*
Blue Gray Gnatcatcher	*Polioptila caerulea*
European Starling	*Sturnus vulgaris*
Yellow Throated Vireo	*Vireo flavifrons*
Red Eyed Vireo	*Vireo olivaceus*
Black-And-White Warbler	*Mniotilta varia*
Golden-Winged Warbler	*Vermivora chrysoptera*
Tennessee Warbler	*Vermivora peregrina*
Nashville Warbler	*Vermivora ruficapilla*
Black-Throated Green Warbler	*Dendroica virens*
Cerulean Warbler	*Dendroica cerulea*
Chestnut-Sided Warbler	*Dendroica pensylvanica*
Pine Warbler	*Dendroica pinus*
Ovenbird	*Seiurus aurocapillus*
Wilson's Warbler	*Wilsonia pusilla*
Canada Warbler	*Wilsonia canadensis*
American Redstart	*Setophaga ruticilla*
House Sparrow	*Passer domesticus*
Common Grackle	*Quiscalus quiscula*
Brown Headed Cowbird	*Molothrus ater*
Northern Oriole	*Icterus galbula*
Scarlet Tanager	*Piranga olivacea*
Northern Cardinal	*Cardinalis cardinalis*
Rose-Breasted Grosbeak	*Pheucticus ludovivianus*
Evening Grosbeak	*Hesperiphona vespertina*
Indigo Bunting	*Passerina cyanea*
Purple Finch	*Carpodacus purpureus*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Rufous-Sided Towhee	*Pipilo erythrophalmus*
Sharp-Tailed Sparrow	*Ammospiza caudacuta*
Slate-Colored Junco	*Junco hyemalis*
Chipping Sparrow	*Spizella passerina*
White-Throated Sparrow	*Zonotrichia albicollis*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia*

North McGaw Park Neighborhood Plan
Wildlife Species Potentially Occurring in the Study Area

MAMMALS	
Common Name	**Scientific Name**
Opossum	*Didelphis marsupialis*
Eastern Mole	*Scalopus aquaticus*
Little Brown Bat	*Myotis lucifugus*
Eastern Long-Eared Bat	*Myotis keenii*
Big Brown Bat	*Eptesicus fuscus*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Eastern Pipistrelle	*Pipistrellus sublavus*
Cottontail Rabbit	*Sylvaugus flordanus*
Woodchuck	*Marmota monax*
Eastern Chipmunk	*Tamias striatus*
Gray Squirrel	*Sciurus carolinensis*
Fox Squirrel	*Sciurus niger*
Southern Flying Squirrel	*Glaucomys volans*
Northern White-Footed Mouse	*Peromyscus leucopus*
Woodland Vole	*Microtus pinetorum*
Common Rat	*Rattus rattus*
House Mouse	*Mus musculus*
Coyote	*Canis latrans*
Red Fox	*Vuples fulva*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Short-Tailed Weasel	*Mustela erminea*
Long-Tailed Weasel	*Mustela frenata*
Least Weasel	*Mustela nivalis*
Striped Skunk	*Mephitis mephitis*
White-Tailed Deer	*Odocoileus virginianus*

North McGaw Park Neighborhood
Community 1: Oak Hickory Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
Acer saccharinum	silver maple	2	Tree	FACW
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
ARCTIUM MINUS	common burdock		Forb	UPL
Arisaema triphyllum	Jack-in-the-pulpit	5	Forb	FACW-
Carya ovata	shagbark hickory	5	Tree	FACU
CELASTRUS ORBICULATA	Asian bittersweet		Woody Vine	NI
Celtis occidentalis	northern hackberry	4	Tree	FAC-
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Cornus alternifolia	pogoda dogwood	7	Tree	[UPL]
Fragaria virginiana	wild strawberry	1	Forb	FAC-
Fraxinus pennsylvanica	green ash	2	Tree	FACW
Galium aparine	sticky-willy	2	Forb	FACU
Galium triflorum	sweet-scented bedstraw	5	Forb	FACU+
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HEMEROCALLIS FULVA	orange daylily		Forb	
Juglans cinerea	butternut	6	Tree	FACU+
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
Onoclea sensibilis	sensitive fern	5	Fern	FACW
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
Pinus resinosa	red pine	7	Tree	FACU
Pinus strobus	eastern white pine	5	Tree	FACU
Podophyllum peltatum	may-apple	4	Forb	FACU
Polygonatum biflorum	Solomon's-seal	4	Forb	FACU
Polygonum virginianum	jumpseed	7	Forb	FAC
Populus grandidentata	large-toothed aspen	3	Tree	FACU
Populus tremuloides	quaking aspen	2	Tree	FAC
Prunus pensylvanica	pin cherry	4	Tree	FACU-*
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
Rubus occidentalis	black raspberry	2	Shrub	[UPL]
Sambucus canadensis	elderberry	3	Shrub	FACW-
Ulmus americana	American elm	3	Tree	FACW-
Ulmus rubra	slippery elm	4	Tree	FAC
Viburnum acerifolium	dockmackie	7	Shrub	UPL*
Viburnum opulus	high-bush cranberry	6	Shrub	FACW
Viola sororia	door-yard violet	3	Forb	FAC-
Vitis riparia	river bank grape	2	Woody Vine	FACW-
Zanthoxylum americanum	common prickly-ash	3	Shrub	UPL

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	39	3.7	23.4
All Species	48	3.0	21.1

North McGaw Park Neighborhood
Community 2: Honeysuckle Shrub Dominated

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
Achillea millefolium	common yarrow	1	Forb	FACU
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
ARCTIUM MINUS	common burdock		Forb	UPL
Athyrium filix-femina	common lady fern	5	Fern	FAC
BROMUS INERMIS	smooth brome		Grass	UPL
Carya ovata	shagbark hickory	5	Tree	FACU
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
CIRSIUM VULGARE	bull thistle		Forb	FACU-
Cornus alternifolia	pogoda dogwood	7	Tree	[UPL]
Cornus racemosa	gray dogwood	2	Shrub	FACW-
DACTYLIS GLOMERATA	orchard grass		Grass	FACU
DAUCUS CAROTA	Queen Anne's-lace		Forb	
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
Goodyera pubescens	downy rattlesnake-plantain	7	Forb	FAC*
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HIERACIUM AURANTIACUM	devil's-paintbrush		Forb	[UPL]
Juniperus virginiana	eastern red-cedar	3	Tree	FACU
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
Oxalis stricta	common yellow oxalis	0	Forb	FACU
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PASTINACA SATIVA	wild parsnip		Forb	[UPL]
PHALARIS ARUNDINACEA	reed canary grass		Grass	FACW+
PHLEUM PRATENSE	timothy		Grass	FACU
PICEA ABIES	Norway spruce		Tree	[UPL]
Pinus resinosa	red pine	7	Tree	FACU
Pinus strobus	eastern white pine	5	Tree	FACU
PLANTAGO MAJOR	plantain		Forb	FAC+
POA PRATENSIS	Kentucky bluegrass		Grass	FAC-
Polygonatum biflorum	Solomon's-seal	4	Forb	FACU
Polygonum virginianum	jumpseed	7	Forb	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Rhus hirta	velvet sumac	2	Shrub	[UPL]
Rhus glabra	smooth sumac	2	Shrub	[UPL]
ROBINIA PSEUDOACACIA	black locust		Tree	FACU-
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
Rubus occidentalis	black raspberry	2	Shrub	[UPL]
Solidago canadensis	common goldenrod	1	Forb	FACU
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Thuja occidentalis	northern white-cedar	9	Tree	FACW
Toxicodendron radicans subsp. negundo	poison-ivy	4	Woody Vine	FAC+
TRIFOLIUM PRATENSE	red clover		Forb	FACU+
Ulmus americana	American elm	3	Tree	FACW-
Urtica dioica	stinging nettle	1	Forb	FAC+
Viburnum opulus	high-bush cranberry	6	Shrub	FACW
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	31	3.5	19.8
All Species	52	2.1	15.3

North McGaw Park Neighborhood
Community 3: Oak, Walnut, Black Locust Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Allium tricoccum	wild leek	6	Forb	FACU+
ARCTIUM MINUS	common burdock		Forb	UPL
Arisaema triphyllum	Jack-in-the-pulpit	5	Forb	FACW-
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Dryopteris carthusiana	toothed wood fern	7	Fern	FACW-
Galium aparine	sticky-willy	2	Forb	FACU
Galium triflorum	sweet-scented bedstraw	5	Forb	FACU+
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HESPERIS MATRONALIS	dame's rocket		Forb	[UPL]
Juglans nigra	black walnut	3	Tree	FACU
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
Oxalis stricta	common yellow oxalis	0	Forb	FACU
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PHALARIS ARUNDINACEA	reed canary grass		Grass	FACW+
Podophyllum peltatum	may-apple	4	Forb	FACU
Polygonatum biflorum	Solomon's-seal	4	Forb	FACU
Polygonum virginianum	jumpseed	7	Forb	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus alba	white oak	7	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROBINIA PSEUDOACACIA	black locust		Tree	FACU-
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Urtica dioica	stinging nettle	1	Forb	FAC+
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	24	3.6	17.6
All Species	36	2.4	14.3

North McGaw Park Neighborhood
Community 4: Box Elder Woodland

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia artemisiifolia	common ragweed	0	Forb	FACU
Ambrosia trifida	giant ragweed	0	Forb	FAC+
ARCTIUM MINUS	common burdock		Forb	UPL
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
Polygonatum biflorum	Solomon's-seal	4	Forb	FACU
Polygonum virginianum	jumpseed	7	Forb	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
SOLANUM DULCAMARA	bittersweet nightshade		Woody Vine	FAC
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	15	2.7	10.6
All Species	23	1.8	8.5

North McGaw Park Neighborhood
Community 5: Remnant Oak Savannah

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
Achillea millefolium	common yarrow	1	Forb	FACU
Agrimonia gryposepala	common agrimony	2	Forb	FACU+
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia artemisiifolia	common ragweed	0	Forb	FACU
Asclepias syriaca	common milkweed	1	Forb	UPL
Asclepias verticillata	whorled milkweed	2	Forb	
Aster pilosus	awl aster	1	Forb	FACU+
BROMUS INERMIS	smooth brome		Grass	UPL
Carya ovata	shagbark hickory	5	Tree	FACU
Conyza canadensis	fleabane	0	Forb	FAC-
Cornus racemosa	gray dogwood	2	Shrub	FACW-
DAUCUS CAROTA	Queen Anne's-lace		Forb	
ECHINOCHLOA CRUSGALLI	barnyard grass		Grass	FACW
ELAEAGNUS UMBELLATA	autumn olive		Shrub	[UPL]
Galium triflorum	sweet-scented bedstraw	5	Forb	FACU+
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
Gleditsia triacanthos	honey locust	7	Tree	FAC
Juglans nigra	black walnut	3	Tree	FACU
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
MORUS ALBA	white mulberry		Tree	FAC
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PHALARIS ARUNDINACEA	reed canary grass		Grass	FACW+
PLANTAGO LANCEOLATA	ribgrass		Forb	FAC
POA PRATENSIS	Kentucky bluegrass		Grass	FAC-
Polygonatum biflorum	Solomon's-seal	4	Forb	FACU
POTENTILLA RECTA	sulphur five-fingers		Forb	[UPL]
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus alba	white oak	7	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Rhus glabra	smooth sumac	2	Shrub	[UPL]
Rhus hirta	velvet sumac	2	Shrub	[UPL]
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
RUMEX ACETOSELLA	common sheep sorrel		Forb	FAC
Solidago canadensis	common goldenrod	1	Forb	FACU
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
TRIFOLIUM AUREUM	golden clover		Forb	
TRIFOLIUM HYBRIDUM	alsike clover		Forb	FAC-
TRIFOLIUM PRATENSE	red clover		Forb	FACU+
Ulmus americana	American elm	3	Tree	FACW-
Urtica dioica	stinging nettle	1	Forb	FAC+
VERBASCUM THAPSUS	common mullein		Forb	[UPL]
Verbena stricta	hoary verbena	3	Forb	
Viburnum acerifolium	dockmackie	7	Shrub	UPL*
Viburnum opulus	high-bush cranberry	6	Shrub	FACW
Viola sororia	door-yard violet	3	Forb	FAC-
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	29	3.0	16.3
All Species	50	1.8	12.4

North McGaw Park Neighborhood
Community 6: Box Elder Forest

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Acer negundo	box elder	0	Tree	FACW-
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia trifida	giant ragweed	0	Forb	FAC+
ARCTIUM MINUS	common burdock		Forb	UPL
Celtis occidentalis	northern hackberry	4	Tree	FAC-
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
CONVALLARIA MAJALIS	lily-of-the-valley		Forb	
Fraxinus pennsylvanica	green ash	2	Tree	FACW
Galium aparine	sticky-willy	2	Forb	FACU
Geum aleppicum	yellow avens	3	Forb	FAC+
Geum canadense	white avens	2	Forb	FAC
Hackelia virginiana	beggar's-lice	3	Forb	FAC-
HEMEROCALLIS FULVA	orange daylily		Forb	
HESPERIS MATRONALIS	dame's rocket		Forb	[UPL]
LEONURUS CARDIACA	motherwort		Forb	[UPL]
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
Osmorhiza longistylis	smooth sweet cicely	4	Forb	FACU-
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PHALARIS ARUNDINACEA	reed canary grass		Grass	FACW+
POA PRATENSIS	Kentucky bluegrass		Grass	FAC-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROBINIA PSEUDOACACIA	black locust		Tree	FACU-
Rubus allegheniensis	Allegheny blackberry	2	Shrub	FACU+
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
Ulmus americana	American elm	3	Tree	FACW-
Urtica dioica	stinging nettle	1	Forb	FAC+
Viola sororia	door-yard violet	3	Forb	FAC-
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	17	2.4	9.9
All Species	29	1.4	7.6

North McGaw Park Neighborhood
Community 7: Remnant Oak Savannah

Scientific Name[1]	Common Name	Coefficient of Conservatism[2]	Physiognomy	Region 3 Wetland Coefficient
Achillea millefolium	common yarrow	1	Forb	FACU
ALLIARIA PETIOLATA	garlic mustard		Forb	FAC
Ambrosia artemisiifolia	common ragweed	0	Forb	FACU
ARCTIUM MINUS	common burdock		Forb	UPL
Asclepias syriaca	common milkweed	1	Forb	UPL
BROMUS INERMIS	smooth brome		Grass	UPL
Carex woodii	pretty sedge	9	Sedge	FAC
Carya ovata	shagbark hickory	5	Tree	FACU
Circaea lutetiana	broad-leaf enchanter's-nightshade	2	Forb	FACU
CIRSIUM ARVENSE	Canada thistle		Forb	FACU
DACTYLIS GLOMERATA	orchard grass		Grass	FACU
DAUCUS CAROTA	Queen Anne's-lace		Forb	
Dioscorea villosa	colic-root	4	Herb. Vine	FAC-
Erigeron annuus	annual fleabane	0	Forb	FAC-
Fragaria vesca	hillside strawberry	3	Forb	
Geum canadense	white avens	2	Forb	FAC
GLECHOMA HEDERACEA	creeping-Charlie		Forb	FACU
HYPERICUM PERFORATUM	St. John's-wort		Forb	[UPL]
Juncus tenuis	path rush	1	Rush	FAC
Juniperus virginiana	eastern red-cedar	3	Tree	FACU
LONICERA X BELLA	Bell's honeysuckle		Shrub	[FACU]
MORUS ALBA	white mulberry		Tree	FAC
Osmorhiza longistylis	smooth sweet cicely	4	Forb	FACU-
Oxalis stricta	common yellow oxalis	0	Forb	FACU
Parthenocissus quinquefolia	Virginia creeper	5	Woody Vine	FAC-
PASTINACA SATIVA	wild parsnip		Forb	[UPL]
PHLEUM PRATENSE	timothy		Grass	FACU
Physalis virginiana	Virginia ground-cherry	4	Forb	[UPL]
PLANTAGO LANCEOLATA	ribgrass		Forb	FAC
PLANTAGO MAJOR	plantain		Forb	FAC+
POA PRATENSIS	Kentucky bluegrass		Grass	FAC-
Populus tremuloides	quaking aspen	2	Tree	FAC
Prunus serotina	wild black cherry	3	Tree	FACU
Quercus alba	white oak	7	Tree	FACU
Quercus macrocarpa	bur oak	5	Tree	FAC-
Quercus rubra	northern red oak	5	Tree	FACU
RANUNCULUS ACRIS	common buttercup		Forb	FACW-
RHAMNUS CATHARTICA	common buckthorn		Tree	FAC-
Ribes cynosbati	dogberry	3	Shrub	[UPL]
ROBINIA PSEUDOACACIA	black locust		Tree	FACU-
ROSA MULTIFLORA	multiflora rose		Shrub	FACU
Rubus occidentalis	black raspberry	2	Shrub	[UPL]
SOLANUM DULCAMARA	bittersweet nightshade		Woody Vine	FAC
Solidago canadensis	common goldenrod	1	Forb	FACU
TARAXACUM OFFICINALE	common dandelion		Forb	FACU
TRIFOLIUM AUREUM	golden clover		Forb	
TRIFOLIUM PRATENSE	red clover		Forb	FACU+
Ulmus americana	American elm	3	Tree	FACW-
VERBASCUM THAPSUS	common mullein		Forb	[UPL]
Viola spp	Violet			
Vitis riparia	river bank grape	2	Woody Vine	FACW-

[1]All capital letters denotes a non-native species

[2]Each native species is assigned a coefficient of conservatism (C) following the methods described by Swink and Wilhelm (1994) and Wilhelm and Masters (1995). Coefficients of conservatism range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a C of 0, is given to plants that have demonstrated little fidelity to any remnant natural community, i.e. may be found almost anywhere. Similarly, a C of 10 is applied to plants that are almost always restricted to a pre-settlement remnant, i.e. a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no C value is applied to these.

FQI Calculations

	Species Richness	Mean C Value	FQI
Native	26	3.0	15.1
All Species	51	1.5	10.8

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Quercus rubra*	northern red oak	25.2	~	D	Standing dead
Total Number of Live Trees: 0		**Total Basal Area: 0**				

SHRUBS: Shrubs represent approximately 80-90% cover; comprised of mostly black cherry and American elm saplings and common buckthorn.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-2**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	8.3	0.38	I	Scaring on side
2	*Prunus serotina*	wild black cherry	11.3	0.70	CD	Healthy
3	*Ulmus americana*	American elm	5.5	0.16	I	Healthy
4	*Prunus serotina*	wild black cherry	7.8	0.33	I	Some herbivory on leaf; otherwise healthy
5	*Prunus serotina*	wild black cherry	5.1	0.14	O	Some herbivory on leaf; otherwise healthy
6	*Quercus macrocarpa*	bur oak	34.3	6.42	D	Some bore holes; few large branches dead
7	*Quercus macrocarpa*	bur oak	19.3	2.03	CD	Patches with bark fallen off; canopy looks healthy
Total Number of Live Trees: 7		**Total Basal Area: 10.16**				

SHRUBS: Shrubs represent approximately 50-60% cover; comprised of common buckthorn, box elder seedlings and honeysuckle shrubs.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-3**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*MORUS ALBA*	white mulberry	5.1	0.14	O	Split
2	*Acer negundo*	box elder	5	0.14	O	Healthy
3	Prunus serotina	black cherry	9.2	0.46	I	Forked with # 4; healthy
4	Prunus serotina	black cherry	7.4	0.30	I	Forked with # 3; healthy
Total Number of Live Trees: 4		**Total Basal Area: 1.04**				

SHRUBS: Shrubs represent approximately 30-40% cover; comprised of mostly box elder saplings and occasionally dogberry (Ribes cynosbati), common buckthorn, and red elm shrubs/saplings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-4**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Populus grandidentata*	large-toothed aspen	8.6	0.40	CD	Healthy
Total Number of Live Trees: 1		**Total Basal Area: 0.40**				

SHRUBS: Shrubs represent approximately 25-35% cover; comprised of mostly box elder saplings and occasionally dogberry (Ribes cynosbati) and common buckthorn shrubs.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-5**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Populus tremuloides*	quaking aspen	10	0.55	CD	Healthy
2	*Populus tremuloides*	quaking aspen	6.9	0.26	I	Healthy
	Populus tremuloides	quaking aspen	4.2	~	O	Dead
3	*Populus tremuloides*	quaking aspen	8.2	0.37	CD	Healthy
4	*Populus tremuloides*	quaking aspen	6	0.20	I	Healthy
5	*Pinus resinosa*	red pine	5.9	0.19	O	Healthy
6	*Pinus resinosa*	red pine	6.4	0.22	O	
7	*Pinus resinosa*	red pine	5.5	0.16	O	
8	*Juglans cinerea*	butternut	14.9	1.21	D	Bore holes; most of tree dead
Total Number of Live Trees: 8		**Total Basal Area: 3.16**				

SHRUBS: Shrubs represent approximately 60-70% cover; and are comprised of nearly equal portions of box elder saplings, common buckthorn shrubs, aspen sapling, dogberry (Ribes cynosbati) shrubs, honeysuckle shrubs, shagbark hickory seedlings, and red elm saplings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-6**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	9.9	0.53	CD	Healthy
	Ulmus americana	American elm	9	~		Standing dead
2	*Prunus serotina*	wild black cherry	13.7	1.02	CD	Healthy
Total Number of Live Trees: 2		**Total Basal Area: 1.56**				

SHRUBS: Shrubs represent approximately 60-70% cover; and are comprised of nearly equal portions of box elder saplings, common buckthorn shrubs, dogberry (Ribes cynosbati) shrubs, honeysuckle shrubs, black cherry, raspberries, and multiflora rose.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak Hickory Forest; 1-7**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Quercus macrocarpa*	bur oak	27.4	4.09	CD	Open crown; some dead braches on top and side
2	*Acer negundo*	box elder	5.4	0.16	O	Many side shoots
3	*Prunus serotina*	wild black cherry	5.9	0.19	O	Top dead; side braches alive
Total Number of Live Trees: 3		**Total Basal Area: 4.44**				

SHRUBS: Shrubs represent approximately 30-40% cover; comprised of mostly dogberry (Ribes cynosbati), box elder saplings and common buckthorn; occasionally *Rubus* and *Viburnum* species and black cherry were present.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	7.9	0.34	D	Main trunk dead; one small branch alive
Total Number of Live Trees: 1		**Total Basal Area: 0.34**				

SHRUBS: Shrubs represent approximately 90-95% cover; comprised of mostly honeysuckle and occasionally red elm, common buckthorn and staghorn sumac.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-2**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*PICEA ABIES*	Norway spruce	9.3	0.47	CD/D	Healthy
2	*PICEA ABIES*	Norway spruce	6.4	0.22	CD/D	Healthy
3	*PICEA ABIES*	Norway spruce	7.5	0.31	CD/D	Healthy
4	*PICEA ABIES*	Norway spruce	12.1	0.80	CD/D	Healthy
5	*PICEA ABIES*	Norway spruce	10	0.55	CD/D	Healthy
6	*PICEA ABIES*	Norway spruce	12	0.79	CD/D	Healthy
7	*Prunus serotina*	wild black cherry	4.5	0.11	CD	Healthy
Total Number of Live Trees: 7		**Total Basal Area: 3.24**				

SHRUBS: Shrubs represent approximately 20-30% cover; comprised of equal portions black cherry, grey dogwood, honeysuckle, and *Rubus* species.

[1]Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2]All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-3**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	5.3	0.15	D	Healthy
Total Number of Live Trees: 1		**Total Basal Area: 0.15**				
SHRUBS: Shrubs represent approximately 95-100% cover and are comprised of honeysuckle.						

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-4**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*PICEA ABIES*	Norway spruce	6.3	0.22	D	Healthy
2	*PICEA ABIES*	Norway spruce	6.8	0.25	D	Healthy
3	*Prunus serotina*	wild black cherry	10.9	0.65	D	Healthy
4	*PICEA ABIES*	Norway spruce	8.3	0.38	D	Healthy
Total Number of Live Trees: 4		**Total Basal Area: 1.49**				

SHRUBS: Shrubs represent approximately 85-90% cover and are comprised of honeysuckle shrubs.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-5**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	6	0.20	D	Healthy
2	*Acer negundo*	box elder	4.7	0.12	CD	Healthy
3	*Rhus glabra*	smooth sumac	4.1	0.09	I	Healthy
Total Number of Live Trees: 3		**Total Basal Area: 0.41**				

SHRUBS: Shrubs represent approximately 70-80% cover; comprised of mostly honeysuckle and occasionally *Rubus* species, sumac and common buckthorn.

[1]Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2]All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Honeysuckle Shrub Dominated; 2-6**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*ROBINIA PSEUDOACACIA*	black locust	10.1	0.56	CD	Healthy
2	*MORUS ALBA*	white mulberry	4.7	0.12	O	Healthy
3	*ROBINIA PSEUDOACACIA*	black locust	8.6	0.40	CD	Healthy
4	*ROBINIA PSEUDOACACIA*	black locust	5	0.14	O	Healthy
5	*Acer negundo*	box elder	4.9	0.13	O	Healthy
6	*Prunus serotina*	wild black cherry	13.1	0.94	D	Stump sprout with #7; some rot at base
7	*Prunus serotina*	wild black cherry	16.7	1.52	D	Stump sprout with #6; some rot at base
8	*Acer negundo*	box elder	4	0.09	O	Healthy
9	*ROBINIA PSEUDOACACIA*	black locust	7.5	0.31	CD	Healthy
10	*Prunus serotina*	wild black cherry	7.6	0.32	CD	Healthy
11	*Prunus serotina*	wild black cherry	9.6	0.50	CD	Healthy
12	*Prunus serotina*	wild black cherry	10.2	0.57	CD	Healthy
13	*Prunus serotina*	wild black cherry	5.9	0.19	CD	Healthy
14	*ROBINIA PSEUDOACACIA*	black locust	8	0.35	CD	Healthy
Total Number of Live Trees: 14		**Total Basal Area: 6.12**				

SHRUBS: Shrubs represent approximately 75-85% cover; comprised of mostly buckthorn and occasional occurrences of honeysuckle and box elder.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Acer negundo*	box elder	8.4	0.38	O	Top dead; side braches alive
2	*ROBINIA PSEUDOACACIA*	black locust	12	0.79	D	Healthy
3	*ROBINIA PSEUDOACACIA*	black locust	11.4	0.71	D	Healthy
	Ulmus americana	American elm	14	~		Standing Dead
4	*Acer negundo*	box elder	11.1	0.67	CD	Healthy
Total Number of Live Trees: 4		**Total Basal Area: 2.55**				

SHRUBS: Shrubs represent approximately 75-85% cover; comprised of mostly honeysuckle and occasionally buckthorn, box elder and mulberry.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-2**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Acer negundo*	box elder	14.6	1.16	O	Top dead
2	*Acer negundo*	box elder	11.4	0.71	I	Healthy
Total Number of Live Trees: 2		**Total Basal Area: 1.87**				

SHRUBS: Shrubs represent approximately 20-30% cover; comprised of honeysuckle and buckthorn.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-3**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*MORUS ALBA*	white mulberry	5	0.14	O	Healthy
2	*MORUS ALBA*	white mulberry	7.5	0.31	I	Healthy
3	*ROBINIA PSEUDOACACIA*	black locust	7.6	0.32	CD	Dying; stump sprout with # 4
4	*ROBINIA PSEUDOACACIA*	black locust	8	0.35	CD	Stump sprout with # 3
5	*MORUS ALBA*	white mulberry	4.7	0.12	O	Healthy
6	*MORUS ALBA*	white mulberry	4.8	0.13	O	Some side branches broken
7	*ROBINIA PSEUDOACACIA*	black locust	11.5	0.72	CD	Healthy
8	*MORUS ALBA*	white mulberry	4	0.09	O	Dying
Total Number of Live Trees: 8		**Total Basal Area: 2.16**				

SHRUBS: Shrubs represent approximately 30-40% cover. Species include honeysuckle (15-25%); mulberry (10-15%); and black cherry (5-10%).

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-4**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Juglans cinerea*	butternut	13.1	0.94	D	Dying
2	*Juglans cinerea*	butternut	16.6	1.50	D	Dying
3	*Juglans cinerea*	butternut	10.5	0.60	D	Dying
4	*Prunus serotina*	wild black cherry	8.3	0.38	CD	Bore holes present
5	*Quercus macrocarpa*	bur oak	5.2	0.15	I	Healthy
6	*Quercus rubra*	northern red oak	11.9	0.77	D	Healthy
7	*Prunus serotina*	wild black cherry	15.6	1.33	D	Dying; broken top branches
8	*Juglans cinerea*	butternut	15.7	1.34	D	some top branches dead
Total Number of Live Trees: 8		**Total Basal Area: 7.01**				

SHRUBS: Shrubs represent approximately 40-50% cover; comprised of mostly honeysuckle and occasionally shagbark hickory seedlings and dogberry (Ribes cynosbati) shrubs.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-5**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*ROBINIA PSEUDOACACIA*	black locust	14.6	1.16	D	Healthy
2	*ROBINIA PSEUDOACACIA*	black locust	10.5	0.60	D	Healthy
3	*Acer negundo*	box elder	6.5	0.23	O	Healthy
4	*ROBINIA PSEUDOACACIA*	black locust	12	0.79	D	Healthy
Total Number of Live Trees: 4		**Total Basal Area: 2.78**				

SHRUBS: Shrubs represent approximately 50-60% cover; comprised of mostly honeysuckle and occasionally black cherry and mulberry seedlings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Oak, Walnut, Black Locust Forest; 3-6**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Prunus serotina*	wild black cherry	5.5	0.16	O	Healthy
2	*ROBINIA PSEUDOACACIA*	black locust	8.6	0.40	CD	Healthy
	ROBINIA PSEUDOACACIA	black locust	10.7	~		Dead
	Prunus serotina	wild black cherry	4.5	~		Dead
3	*ROBINIA PSEUDOACACIA*	black locust	15	1.23	CD	Rot at base
Total Number of Live Trees: 3		**Total Basal Area: 1.8**				

SHRUBS: Shrubs represent approximately 30-40% cover; comprised of mostly honeysuckle and common buckthorn and occasionally black cherry and mulberry seedlings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Box Elder Woodland; 4-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Acer negundo*	box elder	10.1	0.56	O	Significant lean
2	*Acer negundo*	box elder	11.3	0.70	O	leaning
3	*Acer negundo*	box elder	11.2	0.68	D	
4	*Acer negundo*	box elder	8.2	0.37	CD	cracked limb
5	*Acer negundo*	box elder	11.4	0.71	D	
6	*Acer negundo*	box elder	11.6	0.73	D	limb broken; mostly dead; split
7	*Acer negundo*	box elder	6	0.20	O	leaning; almost dead
8	*Acer negundo*	box elder	6.9	0.26	O	
9	*Acer negundo*	box elder	10.1	0.56	D	top broken
10	*Acer negundo*	box elder	6.6	0.24	CD	healthy
11	*Acer negundo*	box elder	9.1	0.45	CD	bark split
12	*Acer negundo*	box elder	8.3	0.38	CD	healthy
13	*Acer negundo*	box elder	7.2	0.28	O	healthy
14	*Acer negundo*	box elder	12.6	0.87	CD	
15	*Acer negundo*	box elder	9	0.44	CD	leaning
16	*Acer negundo*	box elder	8.6	0.40	D	
17	*Acer negundo*	box elder	10.7	0.62	D	

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Box Elder Woodland; 4-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
18	*Acer negundo*	box elder	9	0.44	I	top broken
19	*Acer negundo*	box elder	10.5	0.60	CD	
20	*Acer negundo*	box elder	10.1	0.56	CD	
21	*Acer negundo*	box elder	9.7	0.51	CD	
Total Number of Live Trees: 21		**Total Basal Area: 10.55**				

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Box Elder Woodland; 6-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*ROBINIA PSEUDOACACIA*	black locust	7.5	0.31	CD	Dead Lower Branches
2	*ROBINIA PSEUDOACACIA*	black locust	4.5	0.11	O	Fallen trees leaning on fork
3	*Ulmus rubra*	slippery elm	4.4	0.11	O	Healthy
4	*ROBINIA PSEUDOACACIA*	black locust	6.3	0.22	CD	Healthy
5	*Acer negundo*	box elder	13.7	1.02	D	Lots of side shoots
6	*ROBINIA PSEUDOACACIA*	black locust	6.2	0.21	CD	Healthy
Total Number of Live Trees: 6		**Total Basal Area: 1.97**				

SHRUBS: Shrubs represent approximately 0-10% cover; comprised of mostly honeysuckle (LONICERA X BELLA) and occasionally green ash seedlings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Box Elder Woodland; 6-2**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Ulmus americana*	American elm	4.8	0.13	O	Healthy
2	*Ulmus americana*	American elm	4.9	0.13	O	Healthy
3	*Acer negundo*	box elder	20.1	2.20	D	Stump sprout with # 4; lots of side shoots
4	*Acer negundo*	box elder	13.2	0.95	D	Stump sprout with # 3; lots of side shoots
Total Number of Live Trees: 4		**Total Basal Area: 3.41**				
SHRUBS: Shrubs represent approximately 0-5% cover; comprised of mostly 1-2" mulberry (MORUS ALBA) and occasionally honeysuckle (LONICERA X BELLA) shrubs.						

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Box Elder Woodland; 6-3**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Acer negundo*	box elder	11.2	0.68	D	Healthy
2	*Acer negundo*	box elder	11.6	0.73	D	Healthy
3	*Acer negundo*	box elder	8.6	0.40	D	Healthy
4	*Acer negundo*	box elder	10.7	0.62	D	Healthy
5	*Acer negundo*	box elder	5.9	0.19	O	Leaning; fense growing through tree
6	*Acer negundo*	box elder	9.9	0.53	D	Healthy
7	*Acer negundo*	box elder	8.5	0.39	D	Healthy
Total Number of Live Trees: 7		**Total Basal Area: 3.56**				

SHRUBS: Shrubs represent approximately 70-80% cover; comprised of mostly mulberry (*MORUS ALBA*)and occasionally hackberry (*Celtis occidentalis*) seedlings.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Remnant Oak Savannah; 7-1**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Quercus alba*	white oak	45	11.04	D	minor crown die-back and rot at base; crown approximately 60-70% alive
Total Number of Live Trees: 1		**Total Basal Area: 11.04**				

SHRUBS: Shrubs represent approximately 5-15% cover; comprised of mostly common buckthorn and occasionally multiflora rose.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Remnant Oak Savannah; 7-2**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*ROBINIA PSEUDOACACIA*	black locust	5	0.14	CD	Healthy
2	*ROBINIA PSEUDOACACIA*	black locust	5	0.14	CD	Healthy
3	*ROBINIA PSEUDOACACIA*	black locust	4.5	0.11	CD	Healthy
4	*ROBINIA PSEUDOACACIA*	black locust	4	0.09	CD	Healthy
5	*ROBINIA PSEUDOACACIA*	black locust	5.5	0.16	CD	Healthy
6	*ROBINIA PSEUDOACACIA*	black locust	4	0.09	CD	Healthy
Total Number of Live Trees: 6		**Total Basal Area: 0.72**				
SHRUBS: Shrubs represent approximately 85-95% cover; comprised of mostly black locust seedlings and multiflora rose in addition to occasionally occurrences of common buckthorn.						

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Investigators: Melissa Curran & Dave Giblin						**Forest Type and Plot Number: Remnant Oak Savannah; 7-3**
Tree #	**Species Name[2]**	**Common Name**	**Dbh**	**Basal Area**	**Crown Class[1]**	**Notes**
1	*Ulmus americana*	American elm	15.5	1.31	D	Healthy
2	*MORUS ALBA*	white mulberry	11	0.66	D	Many lower braches dead
3	*Quercus rubra*	northern red oak	26.5	3.83	D	Healthy
4	*Quercus macrocarpa*	bur oak	17	1.58	D	One large side brach dead
Total Number of Live Trees: 4		**Total Basal Area: 7.38**				

SHRUBS: Shrubs represent approximately 5-15% cover; comprised of mostly common buckthorn and occasionally multiflora rose.

[1] Dominant (D): Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side; larger than the average trees in the stand, and with crowns well developed but possibly somewhat crowded on the sides. Codominant (CD): Trees with crowns forming the general level of the crown cover and receive full light from above but comparatively little from the sides; usually with medium-sized crowns more of less crowded on the sides. Intermediate (I):Trees shorter than those in the two preceding classes but with crowns extending into the crown cover formed by codominant and dominant trees; receiving a little direct light from above but none from the sides; usually with small crowns considerably crowded on the sides. Overtopped (O): Trees with crowns entirely below the general level of the crown cover; receiving no direct light either from above or from the sides.

[2] All capital letters denotes a non-native species.

Table B-1. Community 1: Oak Hickory Forest

Species Name	Common Name	Frequency	Average % cover
ALLIARIA PETIOLATA	garlic mustard	79%	40.00
Circaea lutetiana	broad-leaf enchanter's-nightshade	71%	8.39
Geum canadense	white avens	68%	15.79
Arisaema triphyllum	Jack-in-the-pulpit	50%	7.68
Ribes cynosbati	dogberry	46%	9.11
Parthenocissus quinquefolia	Virginia creeper	43%	5.89
Rubus occidentalis	black raspberry	25%	4.29
Viola spp	Violet	18%	2.36
RHAMNUS CATHARTICA	common buckthorn	14%	1.07
Podophyllum peltatum	may-apple	11%	1.96
Prunus serotina	wild black cherry	11%	0.61
Vitis riparia	river bank grape	11%	0.25
Bare Ground/Un-vegetated		11%	8.04
Fragaria virginiana	wild strawberry	4%	3.04
Acer negundo	box elder	4%	1.07
LONICERA X BELLA	Bell's honeysuckle	4%	0.71
Viburnum opulus	high-bush cranberry	4%	0.36
Polygonum virginianum	jumpseed	4%	0.18
ROSA MULTIFLORA	multiflora rose	4%	0.18
Ulmus americana	American elm	4%	0.04

Table B-2. Community 2: Honeysuckle Shrub Dominated

Species Name	Common Name	Frequency	Average % cover
Bare Ground/Un-vegetated		89%	72.86
LONICERA X BELLA	Bell's honeysuckle	68%	10.71
RHAMNUS CATHARTICA	common buckthorn	54%	4.71
Parthenocissus quinquefolia	Virginia creeper	36%	2.43
TARAXACUM OFFICINALE	common dandelion	36%	1.25
Geum canadense	white avens	21%	2.00
PASTINACA SATIVA	wild parsnip	18%	1.11
Vitis riparia	river bank grape	18%	0.75
POA PRATENSIS	Kentucky bluegrass	14%	1.79
Circaea lutetiana	broad-leaf enchanter's-nightshade	11%	3.93
Cornus racemosa	gray dogwood	11%	0.71
Polygonum virginianum	jumpseed	11%	0.93
Prunus serotina	wild black cherry	11%	0.39
Rubus occidentalis	black raspberry	11%	1.07
Achillea millefolium	common yarrow	4%	0.54
Athyrium filix-femina	common lady fern	4%	0.18
ARCTIUM MINUS	common burdock	4%	1.07
DAUCUS CAROTA	Queen Anne's-lace	4%	0.04
HIERACIUM AURANTIACUM	devil's-paintbrush	4%	0.71
PHALARIS ARUNDINACEA	reed canary grass	4%	0.18
PLANTAGO MAJOR	plantain	4%	0.18
ROSA MULTIFLORA	multiflora rose	4%	0.18
Solidago canadensis	common goldenrod	4%	1.07
Ulmus americana	American elm	4%	0.04

Table B-3. Community 3: Oak, Walnut, Black Locust Forest

Species Name	Common Name	Frequency	Average % cover
ALLIARIA PETIOLATA	garlic mustard	83%	48.96
Geum canadense	white avens	83%	25.63
Circaea lutetiana	broad-leaf enchanter's-nightshade	54%	5.04
Bare Ground/Un-vegetated		38%	20.63
RHAMNUS CATHARTICA	common buckthorn	21%	1.29
Arisaema triphyllum	Jack-in-the-pulpit	17%	3.13
LONICERA X BELLA	Bell's honeysuckle	17%	2.29
Prunus serotina	wild black cherry	13%	1.50
Acer negundo	box elder	8%	0.42
Polygonum virginianum	jumpseed	8%	1.67
Ribes cynosbati	dogberry	8%	0.25
Galium triflorum	sweet-scented bedstraw	4%	0.21
Hackelia virginiana	beggar's-lice	4%	1.25
Parthenocissus quinquefolia	Virginia creeper	4%	0.21
Polygonatum biflorum	Solomon's-seal	4%	1.88
ROSA MULTIFLORA	multiflora rose	4%	0.04
Vitis riparia	river bank grape	4%	0.42

Table B-4. Community 4: Box Elder Woodland

Species Name	Common Name	Frequency	Average % cover
ALLIARIA PETIOLATA	garlic mustard	100%	51.25
Geum canadense	white avens	75%	28.75
Ambrosia artemisiifolia	common ragweed	25%	1.25
ARCTIUM MINUS	common burdock	25%	3.75
LONICERA X BELLA	Bell's honeysuckle	25%	8.75
Parthenocissus quinquefolia	Virginia creeper	25%	5
Polygonum virginianum	jumpseed	25%	1.25
Prunus serotina	wild black cherry	25%	1.25
Ribes cynosbati	dogberry	25%	5
Rubus allegheniensis	Allegheny blackberry	25%	6.25
TARAXACUM OFFICINALE	common dandelion	25%	1.25
Bare Ground/Un-vegetated		25%	13.75

Table B-5. Community 5: Remnant Oak Savanna

Species Name	Common Name	Frequency	Average % cover
POA PRATENSIS	Kentucky bluegrass	100%	56.25
DAUCUS CAROTA	Queen Anne's-lace	92%	16.25
BROMUS INERMIS	smooth brome	83%	34.17
GLECHOMA HEDERACEA	creeping-Charlie	67%	9.25
Vitis riparia	river bank grape	50%	3.17
Achillea millefolium	common yarrow	33%	1.42
TARAXACUM OFFICINALE	common dandelion	25%	0.58
ECHINOCHLOA CRUSGALLI	barnyard grass	17%	1.25
POTENTILLA RECTA	sulphur five-fingers	17%	0.50
Rhus hirta	velvet sumac	17%	1.67
RHAMNUS CATHARTICA	common buckthorn	8%	0.83
ROSA MULTIFLORA	multiflora rose	8%	0.83
RUMEX ACETOSELLA	common sheep sorrel	8%	0.08

Table B-6. Community 6: Box Elder Woodland

Species Name	Common Name	Frequency	Average % cover
ALLIARIA PETIOLATA	garlic mustard	100%	48.75
Circaea lutetiana	broad-leaf enchanter's-nightshade	50%	4.58
Geum aleppicum	yellow avens	50%	26.25
ARCTIUM MINUS	common burdock	25%	3.42
Geum canadense	white avens	25%	2.92
HESPERIS MATRONALIS	dame's rocket	17%	0.83
LONICERA X BELLA	Bell's honeysuckle	17%	2.08
Celtis occidentalis	northern hackberry	8%	0.42
Fraxinus pennsylvanica	green ash	8%	0.83
PHALARIS ARUNDINACEA	reed canary grass	8%	6.67
POA PRATENSIS	Kentucky bluegrass	8%	1.25
RHAMNUS CATHARTICA	common buckthorn	8%	0.42
Rubus allegheniensis	Allegheny blackberry	8%	0.42
TARAXACUM OFFICINALE	common dandelion	8%	0.08
Urtica dioica	stinging nettle	8%	0.83
Vitis riparia	river bank grape	8%	0.42
Bare Ground/Un-vegetated		8%	3.33

Table B-7. Community 7: Remnant Oak Savanna

Species Name	Common Name	Frequency	Average % cover
ROSA MULTIFLORA	multiflora rose	67%	12.50
TARAXACUM OFFICINALE	common dandelion	58%	7.08
POA PRATENSIS	Kentucky bluegrass	50%	27.08
Circaea lutetiana	broad-leaf enchanter's-nightshade	42%	6.67
Rubus occidentalis	black raspberry	42%	5.83
ALLIARIA PETIOLATA	garlic mustard	33%	13.75
Geum canadense	white avens	33%	14.17
RHAMNUS CATHARTICA	common buckthorn	33%	2.08
Viola spp	Violet	25%	2.08
Ambrosia artemisiifolia	common ragweed	17%	0.83
BROMUS INERMIS	smooth brome	17%	0.83
DAUCUS CAROTA	Queen Anne's-lace	17%	1.25
Erigeron annuus	annual fleabane	17%	0.83
Prunus serotina	wild black cherry	17%	0.83
Quercus macrocarpa	bur oak	17%	1.25
Ulmus americana	American elm	17%	0.83
Asclepias syriaca	common milkweed	8%	1.25
Carya ovata	shagbark hickory	8%	1.25
GLECHOMA HEDERACEA	creeping-Charlie	8%	3.75
Juncus tenuis	path rush	8%	0.42
LONICERA X BELLA	Bell's honeysuckle	8%	1.67
Oxalis stricta	common yellow oxalis	8%	0.83
PHLEUM PRATENSE	timothy	8%	2.92
PLANTAGO MAJOR	plantain	8%	0.42
Quercus rubra	northern red oak	8%	0.83
Ribes cynosbati	dogberry	8%	1.25
SOLANUM DULCAMARA	bittersweet nightshade	8%	0.42
Solidago canadensis	common goldenrod	8%	2.08
TRIFOLIUM PRATENSE	red clover	8%	1.25

North McGaw Park Neighborhood Plan
Table B-8. Heritage and Specimen Trees Data

Tree ID	DBH	Common Name	Health Notes
Heritage Trees			
HT-01	41.5	bur oak	white fungus on lower braches
HT-02	45	white oak	
HT-03	39.3	white oak	
HT-04	40	white oak	
HT-05	41.8	white oak	
HT-06	41.4	white oak	
HT-07	38.3	white oak	little rot at base
HT-08	47.5	white oak	
HT-09	39	bur oak	
HT-10	45	white oak	some top die back and rot at base; 60-70% of the crown still alive
HT-11	42	white oak	healthy; some limbs trimmed because of power line
HT-12	39	white oak	healthy
HT-13	38	bur oak	minor lower branches dead
HT-14	39	white oak	healthy
HT-15	46	bur oak	already a heritage tree; lower limbs sawed off
HT-16	45	bur oak	healthy
HT-17	39	bur oak	some lower branches dead
HT-18	42	bur oak	
HT-19	39	bur oak	tree stand damage
HT-20	46	bur oak	some health issues
HT-21	38	bur oak	
HT-22	67	bur oak	large side shoot fallen and dead; possible rot at base
HT-23	51	bur oak	moderate defects
HT-24	47	bur oak	moderate defects
HT-25	43	white oak	minor defects
HT-26	39	bur oak	moderate defects
HT-27	37	bur oak	minor defects
HT-28	41	bur oak	healthy
HT-29	40	bur oak	healthy
HT-30	45	sugar maple	moderate defects
HT-31	43	sugar maple	moderate defects
HT-32	40	bur oak	minor defects
Specimen Trees			
ST-01	31.2	bur oak	bark peeling at base
ST-02	31.1	bur oak	bark peeling approximately 10 ft up tree
ST-03	36.5	bur oak	healthy
ST-04	24	bur oak	
ST-05	25	bur oak	
ST-06	21.5	bur oak	
ST-07	26	black oak	
ST-08	29.5	black oak	some lower braches without leaves
ST-09	20.5	bur oak	
ST-10	24.8	bur oak	
ST-11	24.5	bur oak	
ST-12	23.5	bur oak	leaning top
ST-13	30	bur oak	
ST-14	26.5	bur oak	
ST-15	27	bur oak	bark peeling at base
ST-16	30.2	bur oak	
ST-17	32.5	bur oak	
ST-18	27.5	bur oak	
ST-19	20.8	bur oak	bark peeling at base
ST-20	30	bur oak	
ST-21	25.5	bur oak	
ST-22	25	bur oak	bark peeling at base
ST-23	20	bur oak	leaning

North McGaw Park Neighborhood Plan
Table B-8. Heritage and Specimen Trees Data

Tree ID	DBH	Common Name	Health Notes
ST-24	26.5	bur oak	bark peeling at base
ST-25	25.6	black oak	
ST-26	22.3	black oak	
ST-27	24.7	black oak	lower braches without leaves
ST-28	32.5	bur oak	
ST-29	36	white oak	
ST-30	37	bur oak	
ST-31	33	white oak	
ST-32	34	bur oak	
ST-33	34	bur oak	23 dbh bur oak adjacent to this tree
ST-34	37.1	white oak	
ST-35	31.3	white oak	
ST-36	37	bur oak	33 dbh bur oak adjacent to this tree
ST-37	36.5	bur oak	
ST-38	32.5	bur oak	
ST-39	35	bur oak	
ST-40	27	bur oak	
ST-41	22	bur oak	
ST-42	30	white oak	
ST-43	21	shagbark hickory	
ST-44	31	bur oak	
ST-45	27	bur oak	
ST-46	36	bur oak	
ST-47	23	bur oak	
ST-48	29	white oak	
ST-49	23	white oak	
ST-50	23	bur oak	
ST-51	25	bur oak	
ST-52	24	bur oak	
ST-53	24	white oak	
ST-54	29	white oak	
ST-55	38	bur oak	poor health
ST-56	22	bur oak	

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608-839-1998 • Fax 608-839-1995
www.nrc-inc.net

Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 2º, 5-10 mph wind, cold**

NRC Project #: 008-0106-01

Soil Pit #: Pit 1 | **Soil Map Unit: RnB, Ringwood silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Argiudoll** | **Groundwater:**

Slope: Facing 150º downslope; 4% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Toeslope near waterway**

Additional notes:

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-10	Ap	CS	10YR3/2	SIL	---	2 F SBK	FR	---	0.13	---
10-18	Bt1	CS	10YR3/3	SICL	---	2 M SBK	FR	---	0.04	10YR3/2 organic streaking
18-27	Bt2	CS	10YR4/3	SICL	---	2 M SBK	FR	---	0.04	few earthworm holes
27-36	2Bt3	CS	10YR4/4	FSL	2% G	2 M SBK	FR	---	0.5	few earthworm holes
36-45	2BC	CS	10YR4/4	LS/SL/SCL	2% G; 1% CB	1 F SBK	VFR	---	1.63 to 0.11	rotten rock
45-80	2C1	GS	7.5YR4/4	LS	5% G; 2% CB; 5% ST	1 F SBK / MA	VFR	---	1.63	rotten rock
80-125	2C2	---	5YR4/4	GRLS	10% G; 5% CB; 5% ST	MA	VFR	---	1.63	minor inclusions of 10YR4/4 SL

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Project Name: North McGaw Park Neighborhood **Date: 12/31/08**

Client: Teska Associates, Inc. **Conditions: 5º, sunny, cold**

NRC Project #: 008-0106-01

Soil Pit #: Pit 2 **Soil Map Unit: RnB, Ringwood silt loam, 2-6% slopes** **Drainage Class: Well-drained**

Vegetation (or crop): Corn **Classification: Typic Argiudoll** **Groundwater:**

Slope: Facing 150º downslope; 4% slope **Parent Material: Loess over sandy loam till over sandstone bedrock**

Elevation: **Position: Shoulder/backslope off of summit towards waterway**

Additional notes:

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-10	Ap1	CS	10YR3/2	SIL	---	2 M GR	FR	---	0.13	---
10-15	Ap2	CS	10YR3/2	SIL	---	2 M SBK	FR	---	0.13	---
15-29	Bt1	CS	10YR4/3	SICL	---	2 M SBK	FR	---	0.04	---
29-40	2Bt2	CS	7.5YR4/3	SL	3% G	2 M SBK	VFR	---	0.50	---
40-65	2C	CW	5YR4/4	GRLS	10% G; 5% CB; 5% ST	1 M SBK / MA	VFR	---	1.63	---
65+	R	---	yellow	sandstone	---	---	---	---	---	---

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Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 5º, sunny, cold**

NRC Project #: 008-0106-01

Soil Pit #: Pit 3 | **Soil Map Unit: PnB, Plano silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Argiudoll** | **Groundwater:**

Slope: Facing 230º downslope; 11% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Backslope off of summit**

Additional notes:

Frozen 0-7"

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-19	Ap	CS	10YR3/2	SIL	---	2 M SBK / 2 M GR	FR	---	0.13	---
19-38	Bt1	GS	10YR4/3	SICL	---	2 M SBK	FR	---	0.04	10YR3/2 organic streaking
38-47	Bt2	CS	10YR4/4	SIL	---	2 M SBK	FR	---	0.13	---
47-55	Bt3	CS	10YR4/3	SIL	---	1 M SBK	FR	---	0.13	---
55-65	2BC	GS	10YR5/4	SL	3% G	2 M SBK	FR	---	0.50	very moist to wet
65-90	2C1	GS	10YR5/4	GRSL	10% G; 3% CB; 2% ST	MA	VFR	---	0.50	---
90-115	2C2	---	7.5YR5/4	GRLS	10% G; 3% CB; 2% ST	MA	VFR	---	1.63	---

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Project Name: North McGaw Park Neighborhood
Date: 12/31/08
Client: Teska Associates, Inc.
Conditions: 7º, sunny, cold
NRC Project #: 008-0106-01

Soil Pit #: Pit 4
Soil Map Unit: RnC2, Ringwood silt loam, 6-12% slopes, eroded
Drainage Class: Well-drained
Vegetation (or crop): Corn
Classification: Typic Argiudoll
Groundwater:
Slope: Facing 290º downslope; 7% slope
Parent Material: Loess over sandy loam till
Elevation:
Position: Backslope
Additional notes:
Frozen 0-3"

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-13	Ap	CS	10YR3/2	SIL	---	2 M SBK / 2 M GR	FR	---	0.13	---
13-23	Bt1	CS	10YR4/3	SICL	---	2 M SBK	FR	---	0.04	10YR3/2 organic streaking
23-36	Bt2	CS	10YR4/3	SIL	---	2 M SBK	FR	---	0.13	---
36-51	Bt3	CS	10YR4/4	SIL	---	2 M SBK	FR	---	0.13	---
51-57	2Bt4	CS	10YR4/4	SCL/SL	3% G	1 M SBK / 1 M GR	VFR	---	0.11 to 0.50	very moist to wet
57-120	2C	---	10YR5/4	LS/SL	10% G; 2% CB; 2% ST	MA	VFR	---	1.63 to 0.50	SL inclusions approximately 25% of matrix

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Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 10º, sunny**

NRC Project #: 008-0106-01

Soil Pit #: Pit 5 | **Soil Map Unit: DnB, Dodge silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Hapludalf** | **Groundwater:**

Slope: Facing 220º downslope; 2-3% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Backslope on gradual slope**

Additional notes:

Frozen 0-12"

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-13	Ap	CS	10YR4/2	SIL	---	2 M GR	FR	---	0.13	---
13-26	Bt1	CS	10YR5/4	SICL	---	2 M SBK	FI	---	0.04	organo-clay films on faces of peds; charcoal
26-45	Bt2	CS	10YR5/4	SICL	---	2 M SBK	FR	---	0.04	organo-clay films on faces of peds
45-55	Bt3	CS	2.5Y5/4	SIL	---	2 M SBK	FR	10YR4/6 / 1 / 3% / D	0.13	scattered 2.5Y6/2 depletions; organo-clay films on faces of peds
55-61	Bt4	CS	10YR5/4	SICL	---	2 M SBK	FR	10YR4/6 / 1 / 3% / D	0.04	scattered 2.5Y6/2 depletions
61-73	2Bt5	CS	10YR5/4	CL	2% G	2 M SBK	FR	---	0.03	organic streaking observed
73-85	2C1	GS	10YR4/4	GRS	15% G; 5% CB; 2% ST	MA	VFR	---	3.60	---
85-100	2C2	---	VA	GRS	15% G; 5% CB; 2% ST	SG	L	---	3.60	---

NRC
Natural Resources Consulting, Inc.
P.O. Box 128
Cottage Grove, WI 53527-0128
608-839-1998 • Fax 608-839-1995
www.nrc-inc.net

Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 12º, sunny**

NRC Project #: 008-0106-01

Soil Pit #: Pit 6 | **Soil Map Unit: RnB, Ringwood silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Argiudoll** | **Groundwater:**

Slope: Facing 280º downslope; 1% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Shoulder of subtle summit**

Additional notes:

Frozen 0-7" | ****Two page description**

Concave slope downward at 280º

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-12	Ap1	CS	10YR2/2	SIL	---	2 F SBK / 2 M GR	FR	---	0.13	---
12-20	Ap2	CS	10YR3/4	SIL	---	2 M SBK	FR	---	0.13	10YR2/2 organo-clay films on faces of peds
20-26	Bt	CS	10YR4/3	SICL	2% G	2 M SBK	FR	---	0.04	organo-clay films on faces of peds; scattered rotten rock with CL texture
26-32	2BC1	GS	10YR4/4 / VA	SICL / GRCOS	20% G	2 M SBK / MA	VFR	7.5YR4/6 / 1 & 2 / 5% / D	0.04 to 3.60	scattered rotten rock
32-45	2BC2	GS	10YR4/2	CL / SL	2% G	2 M SBK	FR	10YR4/6 / 2 & 2 / 5% / D	0.03 to 0.50	2.5Y6/2 depletions common; organic streaking up to 5" in length; scattered rotten rock with SL texture

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Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 12º, sunny**

NRC Project #: 008-0106-01

Soil Pit #: Pit 6 | **Soil Map Unit: RnB, Ringwood silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Argiudoll** | **Groundwater:**

Slope: Facing 280º downslope; 1% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Shoulder of subtle summit**

Additional notes:

Frozen 0-7" | ****Two page description**

Concave slope downward at 280º

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
45-95	2BC3	GS	10YR4/4 / VA	SIC / GRSL / GrS	20% G; 5% CB; 2% ST	MA	VFR	10YR4/6 / 1 & 2 / 5% / D	0.07 to 3.60	2.5Y6/2 depletions and organic streaking; redox, depletions, and organic streaking observed in 10YR4/4 SIC only; all three textures are approximately equally distributed throughout the horizon
95-110	2C	---	10YR5/3 / VA	GRS	15% G; 5% CB; 2% ST	SG	L	---	3.60	---

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www.nrc-inc.net

Project Name: North McGaw Park Neighborhood | **Date: 12/31/08**

Client: Teska Associates, Inc. | **Conditions: 12º, sunny**

NRC Project #: 008-0106-01

Soil Pit #: Pit 7 | **Soil Map Unit: RnB, Ringwood silt loam, 2-6% slopes** | **Drainage Class: Well-drained**

Vegetation (or crop): Corn | **Classification: Typic Argiudoll** | **Groundwater:**

Slope: Facing 40º downslope; 5% slope | **Parent Material: Loess over sandy loam till**

Elevation: | **Position: Lower mid-slope to toeslope**

Additional notes:

Frozen 0-3"

*** Design infiltration rate (without measurement)as per Table 2 of the Wisconsin Department of Natural Resources "Site Evaluation for Stormwater Infiltration" (Design Standard 1002)**

Depth (inches)	Horizon	Bnd	Matrix Color	Texture	Rock Frag Size / Qty	Structure Gr / Size / Type	Consistence (moist)	Mottles / Redox Color / Size / Abund / Contrast	Infiltration Rate* (In/hr)	Other Features
0-12	Ap	CS	10YR3/2	SIL	---	2 F SBK / 2 M GR	FR	---	0.13	---
12-22	Bt1	CS	10YR4/4	SICL	---	2 M SBK	FR	---	0.04	10YR3/2 organic streaking
22-31	Bt2	CS	10YR4/2 / 10YR4/3	SICL	2% G	2 F SBK	FR	---	0.04	---
31-39	2BC	GS	7.5YR4/4	SL	10% G; 2% CB	2 F SBK / MA	VFR	---	0.50	scattered rotten rock
39-120	2C	---	7.5YR5/4	GRLS	15% G; 3% CB; 3% ST	MA	VFR	---	1.63 to 3.60	---

Appendix 5A

McGaw Park Neighborhood Plan

System Analysis Plan – Sanitary, Water, and Stormwater

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Selected XP-SWMM Output, Predevelopment Conditions, 2-year event
Neighborhood-only model for detention storage calculations

```
*=========================================================*
 |         RUNOFF TABLES IN THE OUTPUT FILE.               |
 |  These are the more important tables in the output file. |
 |  You can use your editor to find the table numbers,      |
 |  for example: search for Table R3 to check continuity.   |
 |  This output file can be imported into a Word Processor  |
 |  and printed on US letter or A4 paper using portrait     |
 |  mode, courier font, a size of 8 pt. and margins of 0.75 |
 |                                                          |
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 | Table R3  - Raingage and Infiltration Database Names     |
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 | Table R8  - Infiltration/Inflow Continuity Check         |
 | Table R9  - Summary Statistics for Subcatchments         |
 | Table R10 - Sensitivity anlysis for Subcatchments        |
  *=========================================================*

#####################################
# Rainfall input summary from Runoff #
#####################################

Total rainfall for gage #     1 is    2.9000 inches

  ###################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A    #
  #            Physical Hydrology Data              #
  ###################################################
```

Number	Subcatchment Name	Channel or inlet	Width (ft)	Area (ac)	Per-cent Imperv	Slope ft/ft	"n" Imprv	"n" Perv	Deprs-sion Storge Imprv	Deprs-sion Strge Perv	Prcnt Zero Deten-tion
1	McGaw_SW2#2	McGaw_SW2	1.0000	59.304	0.00	0.100	0.020	0.020	0.000	0.000	0.00
2	McGaw_SW1#2	McGaw_SW1	1.0000	17.743	0.00	0.100	0.020	0.020	0.000	0.000	0.00
3	McGaw_SE2#1	McGaw_SE2	1.0000	4.0810	100.00	0.100	0.020	0.020	0.000	0.000	0.00
4	McGaw_SE2#2	McGaw_SE2	1.0000	135.50	0.00	0.100	0.020	0.020	0.000	0.000	0.00
5	McGaw_SE1#1	McGaw_SE1	1.0000	8.5690	100.00	0.100	0.020	0.020	0.000	0.000	0.00
6	McGaw_SE1#2	McGaw_SE1	1.0000	49.694	0.00	0.100	0.020	0.020	0.000	0.000	0.00
7	McGaw_E1#1	McGaw_E1	1.0000	3.3770	100.00	0.100	0.020	0.020	0.000	0.000	0.00
8	McGaw_E1#2	McGaw_E1	1.0000	68.401	0.00	0.100	0.020	0.020	0.000	0.000	0.00
9	McGaw_NE1#2	McGaw_NE1	1.0000	26.420	0.00	0.100	0.020	0.020	0.000	0.000	0.00
10	McGaw_NW1#1	McGaw_NW1	1.0000	.22000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
11	McGaw_NW1#2	McGaw_NW1	1.0000	51.073	0.00	0.100	0.020	0.020	0.000	0.000	0.00
12	McGaw_N1#2	McGaw_N1	1.0000	97.464	0.00	0.100	0.020	0.020	0.000	0.000	0.00
13	McGaw_N2#1	McGaw_N2	1.0000	2.4150	100.00	0.100	0.020	0.020	0.000	0.000	0.00
14	McGaw_N2#2	McGaw_N2	1.0000	59.013	0.00	0.100	0.020	0.020	0.000	0.000	0.00
15	McGaw_NE3#1	McGaw_NE3	1.0000	9.1790	100.00	0.100	0.020	0.020	0.000	0.000	0.00
16	McGaw_NE3#2	McGaw_NE3	1.0000	70.619	0.00	0.100	0.020	0.020	0.000	0.000	0.00
17	McGaw_NE2#1	McGaw_NE2	1.0000	8.0130	100.00	0.100	0.020	0.020	0.000	0.000	0.00
18	McGaw_NE2#2	McGaw_NE2	1.0000	38.085	0.00	0.100	0.020	0.020	0.000	0.000	0.00

```
#############################################################################################################
#          Table R2.  SUBCATCHMENT  DATA                                                                    #
#                     Infiltration or Time of Concentration Data                                            #
#                                                                                                           #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)              Infl #4(#8)      #
# SCS                 ->   Comp CN          Time Conc          Shape Factor        Depth or Fraction       #
# SBUH                ->   Comp CN          Time Conc                  N/A                      N/A       #
# Green Ampt          ->   Suction          Hydr Cond            Initial MD                     N/A       #
# Horton              ->  Max Rate           Min Rate   Decay Rate (1/sec)      Max. Infilt. Volume       #
# Proportional        ->  Constant                N/A                  N/A                      N/A       #
# Initial/Cont Loss   ->   Initial         Continuing                  N/A                      N/A       #
# Initial/Proportional ->  Initial           Constant                  N/A                      N/A       #
# Laurenson Parameters ->  B Value       Pervious "n"      Impervious Cont                 Exponent       #
# Rational Formula     -> Tc Method   Flow Path Length      Flow Path Slope  Roughness or Retardance       #
#                              (#1 - #4 is Impervious Data / #5 - #8 is Pervious Data)                      #
#                      Rational Formula Tc Method: 1 = Constant                                             #
```

```
#                                          2 = Friend's Equation                              #
#                                          3 = Kinematic Wave                                 #
#                                          4 = Alameda Method                                 #
#                                          5 = Izzard's Formula                               #
#                                          6 = Kerby's Equation                               #
#                                          7 = Kirpich's Equation                             #
#                                          8 = Bransby Williams Equation                      #
#                                          9 = Federal Aviation Authority Equation            #
#############################################################################################################
```

Subcatchment Number	Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	McGaw_SW2#2	67.0000	0.3500	484.0000	0.2000				
2	McGaw_SW1#2	68.0000	0.3333	484.0000	0.2000				
3	McGaw_SE2#1	98.0000	0.4500	484.0000	0.2000				
4	McGaw_SE2#2	65.0000	0.4500	484.0000	0.2000				
5	McGaw_SE1#1	98.0000	0.5167	484.0000	0.2000				
6	McGaw_SE1#2	66.4000	0.5167	484.0000	0.2000				
7	McGaw_E1#1	98.0000	0.4667	484.0000	0.2000				
8	McGaw_E1#2	67.1000	0.4667	484.0000	0.2000				
9	McGaw_NE1#2	68.6000	0.3667	484.0000	0.2000				
10	McGaw_NW1#1	98.0000	0.4667	484.0000	0.2000				
11	McGaw_NW1#2	68.0000	0.4667	484.0000	0.2000				
12	McGaw_N1#2	68.0000	0.6333	484.0000	0.2000				
13	McGaw_N2#1	98.0000	0.5500	484.0000	0.2000				
14	McGaw_N2#2	66.6000	0.5500	484.0000	0.2000				
15	McGaw_NE3#1	98.0000	0.4833	484.0000	0.2000				
16	McGaw_NE3#2	63.7000	0.4833	484.0000	0.2000				
17	McGaw_NE2#1	98.0000	0.6667	484.0000	0.2000				
18	McGaw_NE2#2	65.1000	0.6667	484.0000	0.2000				

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Subcatchment Number	Name	Gage No	Infiltration Type	Routing Type	Rainfall Database Name	Infiltration Database Name
1	McGaw_SW2#2	1	SCS Method	SCS curvilinear		
2	McGaw_SW1#2	1	SCS Method	SCS curvilinear		
3	McGaw_SE2#1	1	SCS Method	SCS curvilinear		
4	McGaw_SE2#2	1	SCS Method	SCS curvilinear		
5	McGaw_SE1#1	1	SCS Method	SCS curvilinear		
6	McGaw_SE1#2	1	SCS Method	SCS curvilinear		
7	McGaw_E1#1	1	SCS Method	SCS curvilinear		
8	McGaw_E1#2	1	SCS Method	SCS curvilinear		
9	McGaw_NE1#2	1	SCS Method	SCS curvilinear		
10	McGaw_NW1#1	1	SCS Method	SCS curvilinear		
11	McGaw_NW1#2	1	SCS Method	SCS curvilinear		
12	McGaw_N1#2	1	SCS Method	SCS curvilinear		
13	McGaw_N2#1	1	SCS Method	SCS curvilinear		
14	McGaw_N2#2	1	SCS Method	SCS curvilinear		
15	McGaw_NE3#1	1	SCS Method	SCS curvilinear		
16	McGaw_NE3#2	1	SCS Method	SCS curvilinear		
17	McGaw_NE2#1	1	SCS Method	SCS curvilinear		
18	McGaw_NE2#2	1	SCS Method	SCS curvilinear		

```
 Total Number of Subcatchments...            18
 Total Tributary Area (acres)....        708.98
 Impervious Area (acres).........         35.66
 Pervious Area (acres)...........        673.32
 Total Width (feet)..............         18.00
 Percent Imperviousness..........          5.03


        ###################################################
        # Table R9. Summary Statistics for Subcatchments #
        ###################################################

 Note: Total Runoff Depth includes pervious & impervious area
       Pervious and Impervious Runoff Depth is only the runoff from those two areas.
```

Subcatchment	McGaw_SW2#2	McGaw_SW1#2	McGaw_SE2#1	McGaw_SE2#2	McGaw_SE1#1	McGaw_SE1#2
Area (acres)	59.30400	17.74300	4.08100	135.50300	8.56900	49.69400
Percent Impervious	0.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000

Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.53866	0.57875	0.00000	0.46341	0.00000	0.51538
Total Losses (in).....	2.36134	2.32125	0.00000	2.43659	0.00000	2.38462
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	22.58532	7.65578	0.00000	36.03235	0.00000	14.24576
Total Impervious Area						

Total Runoff Depth (in)	0.00000	0.00000	2.68193	0.00000	2.68113	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	7.75285	0.00000	15.53484	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.53866	0.57875	2.68193	0.46341	2.68113	0.51538
Peak Runoff Rate (cfs).	22.58532	7.65578	7.75285	36.03235	15.53484	14.24576
Unit Runoff (in/hr)....	0.38084	0.43148	1.89974	0.26592	1.81291	0.28667
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_E1#1	McGaw_E1#2	McGaw_NE1#2	McGaw_NW1#1	McGaw_NW1#2	McGaw_N1#2
Area (acres).....	3.37700	68.40100	26.42000	0.02200	51.07300	97.46400
Percent Impervious.....	100.00000	0.00000	0.00000	100.00000	0.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.54100	0.60163	0.00000	0.57681	0.57854
Total Losses (in).....	0.00000	2.35900	2.29837	0.00000	2.32319	2.32146
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	22.45445	11.45166	0.00000	18.37636	29.00263
Total Impervious Area						

Total Runoff Depth (in)	2.67377	0.00000	0.00000	2.67377	0.00000	0.00000
Peak Runoff Rate (cfs).	6.31965	0.00000	0.00000	0.04117	0.00000	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.67377	0.54100	0.60163	2.67377	0.57681	0.57854
Peak Runoff Rate (cfs).	6.31965	22.45445	11.45166	0.04117	18.37636	29.00263
Unit Runoff (in/hr)....	1.87138	0.32828	0.43345	1.87138	0.35981	0.29757
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#1	McGaw_N2#2	McGaw_NE3#1	McGaw_NE3#2	McGaw_NE2#1	McGaw_NE2#2
Area (acres).....	2.41500	59.01300	9.17900	70.61900	8.01300	38.08500

Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.52361	0.00000	0.41677	0.00000	0.46759
Total Losses (in).....	0.00000	2.37639	0.00000	2.48323	0.00000	2.43241
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	16.65942	0.00000	15.22816	0.00000	8.00071
Total Impervious Area						
Total Runoff Depth (in)	2.68399	0.00000	2.67736	0.00000	2.68509	0.00000
Peak Runoff Rate (cfs).	4.25820	0.00000	16.92503	0.00000	12.92345	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.68399	0.52361	2.67736	0.41677	2.68509	0.46759
Peak Runoff Rate (cfs).	4.25820	16.65942	16.92503	15.22816	12.92345	8.00071
Unit Runoff (in/hr)....	1.76323	0.28230	1.84389	0.21564	1.61281	0.21008
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

```
===> Runoff simulation ended normally.

#########################################################
#    Entry made to the HYDRAULIC Layer(Block) of SWMM #
#    Last Updated October,2000 by XP Software         #

    Existing Land Use Conditions
    Fitchburg McGaw Park Neighborhood Plan


*============================================================*
|        HYDRAULICS TABLES IN THE OUTPUT FILE                |
|  These are the more important tables in the output file.   |
|  You can use your editor to find the table numbers,        |
|  for example: search for Table E20 to check continuity.    |
|  This output file can be imported into a Word Processor    |
|  and printed on US letter or A4 paper using portrait       |
|  mode, courier font, a size of 8 pt. and margins of 0.75   |
|                                                            |
| Table E1   - Basic Conduit Data                            |
| Table E2   - Conduit Factor Data                           |
| Table E3a  - Junction Data                                 |
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| Table E4   - Conduit Connectivity Data                     |
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| Table E4b  - Real Time Control Data                        |
| Table E5   - Junction Time Step Limitation Summary         |
| Table E5a  - Conduit Explicit Condition Summary            |
| Table E6   - Final Model Condition                         |
| Table E7   - Iteration Summary                             |
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| Table E9   - Junction  Summary  Statistics                 |
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| Table E11  - Area assumptions used in the analysis         |
| Table E12  - Mean conduit information                      |
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| Table E14b - Floodplain Mapping                            |
| Table E15  - Spreadsheet Info List                         |
| Table E15a - Spreadsheet Reach List                        |
```

| Table E16 - New Conduit Output Section |
| Table E17 - Pump Operation |
| Table E18 - Junction Continuity Error |
| Table E19 - Junction Inflow Sources |
| Table E20 - Junction Flooding and Volume List |
| Table E21 - Continuity balance at simulation end |
| Table E22 - Model Judgement Section |

Table E1 - Conduit Data

Inp Num	Conduit Name	Length (ft)	Conduit Class	Area (ft^2)	Manning Coef.	Max Width (ft)	Depth (ft)	Trapezoid Side Slopes	
1	SW2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
2	SW1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
3	SW_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
4	SE2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
5	Link97	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
6	SE1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
7	Link99	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
8	E1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
9	NE1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
10	NW1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
11	N1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
12	Link106	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
13	N2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
14	NE3_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
15	NE2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
16	Link112	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
17	Link114	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
18	Link115	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
19	Link116	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
20	N_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
21	NE_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
22	E_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000

Total length of all conduits .... 2200.0000 feet

Table E3a - Junction Data

Inp Num	Junction Name	Ground Elevation	Crown Elevation	Invert Elevation	Qinst cfs	Initial Depth-ft	Interface Flow (%)
1	McGaw_NE1	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
2	McGaw_E1	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
3	McGaw_SE1	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
4	McGaw_SE2	1010.0000	1004.0000	1000.0000	0.0000	0.0000	100.0000
5	McGaw_SW1	1010.0000	1005.0000	1001.0000	0.0000	0.0000	100.0000
6	McGaw_NE3	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
7	McGaw_NE2	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
8	McGaw_NW1	1010.0000	1004.0000	1000.0000	0.0000	0.0000	100.0000
9	McGaw_N1	1010.0000	1004.0000	1000.0000	0.0000	0.0000	100.0000
10	McGaw_N2	1010.0000	1004.0000	1000.0000	0.0000	0.0000	100.0000
11	McGaw_SW2	1010.0000	1005.0000	1001.0000	0.0000	0.0000	100.0000
12	Node37	1010.0000	1004.0000	1000.0000	0.0000	0.0000	100.0000
13	Node38	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
14	Node39	1010.0000	1002.0000	998.0000	0.0000	0.0000	100.0000
15	Node41	1010.0000	1001.0000	997.0000	0.0000	0.0000	100.0000
16	Node42	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
17	Node43	1010.0000	1002.0000	998.0000	0.0000	0.0000	100.0000
18	Node45	1010.0000	1001.0000	997.0000	0.0000	0.0000	100.0000
19	Node47	1010.0000	1000.0000	996.0000	0.0000	0.0000	100.0000
20	Out	1010.0000	999.0000	995.0000	0.0000	0.0000	100.0000
21	Node49	1010.0000	1003.0000	999.0000	0.0000	0.0000	100.0000
22	Node50	1010.0000	1002.0000	998.0000	0.0000	0.0000	100.0000
23	Node51	1010.0000	1002.0000	998.0000	0.0000	0.0000	100.0000

Table E4 - Conduit Connectivity

Input Number	Conduit Name	Upstream Node	Downstream Node	Upstream Elevation	Downstream Elevation

```
     1         SW2_Link        McGaw_SW2           Node37    1001.0000   1000.0000 No Design
     2         SW1_Link        McGaw_SW1           Node37    1001.0000   1000.0000 No Design
     3       SW_Combine           Node37           Node38    1000.0000    999.0000 No Design
     4         SE2_Link        McGaw_SE2           Node38    1000.0000    999.0000 No Design
     5           Link97           Node38           Node39     999.0000    998.0000 No Design
     6         SE1_Link        McGaw_SE1           Node39     999.0000    998.0000 No Design
     7           Link99           Node39           Node41     998.0000    997.0000 No Design
     8          E1_Link         McGaw_E1           Node51     999.0000    998.0000 No Design
     9         NE1_Link        McGaw_NE1           Node51     999.0000    998.0000 No Design
    10         NW1_Link        McGaw_NW1           Node42    1000.0000    999.0000 No Design
    11          N1_Link         McGaw_N1           Node49    1000.0000    999.0000 No Design
    12          Link106          Node42           Node43     999.0000    998.0000 No Design
    13          N2_Link         McGaw_N2           Node49    1000.0000    999.0000 No Design
    14         NE3_Link        McGaw_NE3           Node50     999.0000    998.0000 No Design
    15         NE2_Link        McGaw_NE2           Node50     999.0000    998.0000 No Design
    16          Link112          Node45           Node47     997.0000    996.0000 No Design
    17          Link114          Node41           Node47     997.0000    996.0000 No Design
    18          Link115          Node47              Out     996.0000    995.0000 No Design
    19          Link116          Node43           Node45     998.0000    997.0000 No Design
    20        N_Combine          Node49           Node43     999.0000    998.0000 No Design
    21       NE_Combine          Node50           Node45     998.0000    997.0000 No Design
    22        E_Combine          Node51           Node41     998.0000    997.0000 No Design


 *================================================*
 |          FREE OUTFALL DATA (DATA GROUP I1)     |
 |         BOUNDARY CONDITION ON DATA GROUP J1    |
 *================================================*

 Outfall at Junction....Out              has boundary condition number...         1


 *================================================*
 |        INTERNAL CONNECTIVITY INFORMATION       |
 *================================================*

          CONDUIT         JUNCTION         JUNCTION
---------------- ---------------- ----------------
        FREE # 1              Out         BOUNDARY

 *=================================================*
 |        Boundary Condition Information           |
 |                 Data Groups J1-J4               |
 *=================================================*


 BC NUMBER..         1 Control water surface elevation is..      0.00 feet.


 ##########################################
 # Header information from interface file: #
 ##########################################

 Title from first computational layer:
 Existing Land Use Conditions
 Montgomery Associates

 Title from immediately preceding computational layer
 Existing Land Use Conditions
 Montgomery Associates

 Name of preceding layer:.................        Runoff Layer
 Initial Julian date (IDATEZ).....................   1993001
 Initial time of day in seconds (TZERO)............       0.0
 No. Transfered input locations...................        11
 No. Transfered pollutants........................         0
 Size of total catchment area (acres).............    708.98

 ##################################################
 # Element numbers of interface inlet locations: #
 ##################################################

 McGaw_SW2        McGaw_SW1        McGaw_SE2        McGaw_SE1        McGaw_E1         McGaw_NE1        McGaw_NW1
 McGaw_N1         McGaw_N2         McGaw_NE3        McGaw_NE2

 Conversion factor to cfs for flow units on interface file.  Multiply by:     1.00000

######## Important Information ########
Start date/time of interface file was.. 1993001    0.0000 hours
Start date/time of the simulation was.. 1993001    0.0000 hours
```

Same date/time found in interface file and model

Table E9 - JUNCTION SUMMARY STATISTICS
The Maximum area is only the area of the node, it does not include the area of the surrounding conduits

Junction Name	Ground Elevation feet	Uppermost PipeCrown Elevation feet	Maximum Junction Elevation feet	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Freeboard of node feet	Maximum Junction Area ft^2	Maximum Gutter Depth feet	Maximum Gutter Width feet	Maximum Gutter Velocity ft/s
McGaw_NE1	1010.0000	1003.0000	999.9009	12	45	0.0000	10.0991	12.5660	0.0000	0.0000	0.0000
McGaw_E1	1010.0000	1003.0000	1000.2503	12	44	0.0000	9.7497	12.5660	0.0000	0.0000	0.0000
McGaw_SE1	1010.0000	1003.0000	1000.4260	12	45	0.0000	9.5740	12.5660	0.0000	0.0000	0.0000
McGaw_SE2	1010.0000	1004.0000	1001.5175	12	44	0.0000	8.4825	12.5660	0.0000	0.0000	0.0000
McGaw_SW1	1010.0000	1005.0000	1001.6528	12	39	0.0000	8.3472	12.5660	0.0000	0.0000	0.0000
McGaw_NE3	1010.0000	1003.0000	1000.3030	12	45	0.0000	9.6970	12.5660	0.0000	0.0000	0.0000
McGaw_NE2	1010.0000	1003.0000	1000.0656	12	50	0.0000	9.9344	12.5660	0.0000	0.0000	0.0000
McGaw_NW1	1010.0000	1004.0000	1001.0139	12	45	0.0000	8.9861	12.5660	0.0000	0.0000	0.0000
McGaw_N1	1010.0000	1004.0000	1001.2607	12	53	0.0000	8.7393	12.5660	0.0000	0.0000	0.0000
McGaw_N2	1010.0000	1004.0000	1001.0715	12	49	0.0000	8.9285	12.5660	0.0000	0.0000	0.0000
McGaw_SW2	1010.0000	1005.0000	1002.1189	12	41	0.0000	7.8811	12.5660	0.0000	0.0000	0.0000
Node37	1010.0000	1004.0000	1001.2832	12	41	0.0000	8.7168	12.5660	0.0000	0.0000	0.0000
Node38	1010.0000	1003.0000	1000.9154	12	43	0.0000	9.0846	12.5660	0.0000	0.0000	0.0000
Node39	1010.0000	1002.0000	1000.2625	12	45	0.0000	9.7375	12.5660	0.0000	0.0000	0.0000
Node41	1010.0000	1001.0000	999.7250	12	46	0.0000	10.2750	12.5660	0.0000	0.0000	0.0000
Node42	1010.0000	1003.0000	1000.0914	12	49	0.0000	9.9086	12.5660	0.0000	0.0000	0.0000
Node43	1010.0000	1002.0000	999.9539	12	50	0.0000	10.0461	12.5660	0.0000	0.0000	0.0000
Node45	1010.0000	1001.0000	999.6266	12	49	0.0000	10.3734	12.5660	0.0000	0.0000	0.0000
Node47	1010.0000	1000.0000	999.3437	12	48	0.0000	10.6563	12.5660	0.0000	0.0000	0.0000
Out	1010.0000	999.0000	997.5431	12	48	0.0000	12.4569	12.5660	0.0000	0.0000	0.0000
Node49	1010.0000	1003.0000	1000.6100	12	52	0.0000	9.3900	12.5660	0.0000	0.0000	0.0000
Node50	1010.0000	1002.0000	999.8310	12	49	0.0000	10.1690	12.5660	0.0000	0.0000	0.0000
Node51	1010.0000	1002.0000	999.8294	12	46	0.0000	10.1706	12.5660	0.0000	0.0000	0.0000

Table E10 - CONDUIT SUMMARY STATISTICS
Note: The peak flow may be less than the design flow and the conduit may still surcharge because of the downstream boundary conditions.

* denotes an open conduit that has been overtopped this is a potential source of severe errors

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Ends Upstream (ft)	Maximum Depth at Pipe Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS
SW2_Link	397.6640	4.9708	48.0000	22.5772	12	41	2.1577	12	39	0.0568	1002.119	1001.283	.2797	.3208
SW1_Link	397.6640	4.9708	48.0000	7.6431	12	39	1.0142	12	37	0.0192	1001.653	1001.283	.1632	.3208
SW_Combine	397.6640	4.9708	48.0000	30.1065	12	41	1.8745	12	38	0.0757	1001.283	1000.915	.3208	.4788
SE2_Link	397.6640	4.9708	48.0000	43.1253	12	44	2.3552	12	47	0.1084	1001.517	1000.915	.3794	.4788
Link97	397.6640	4.9708	48.0000	71.9501	12	43	2.8388	12	41	0.1809	1000.915	1000.263	.4788	.5656
SE1_Link	397.6640	4.9708	48.0000	29.1179	12	46	1.4428	12	33	0.0732	1000.426	1000.263	.3565	.5656
Link99	397.6640	4.9708	48.0000	100.3580	12	44	2.9525	12	42	0.2524	1000.262	999.7250	.5656	.6812
E1_Link	397.6640	4.9708	48.0000	28.4991	12	44	1.9116	12	33	0.0717	1000.250	999.8294	.3126	.4574
NE1_Link	397.6640	4.9708	48.0000	11.2538	12	39	1.1603	12	31	0.0283	999.9009	999.8294	.2252	.4574
NW1_Link	397.6640	4.9708	48.0000	18.4142	12	45	2.2481	12	43	0.0463	1001.014	1000.091	.2535	.2728
N1_Link	397.6640	4.9708	48.0000	28.9993	12	53	2.1061	12	55	0.0729	1001.261	1000.610	.3152	.4025
Link106	397.6640	4.9708	48.0000	18.0121	12	46	1.3514	12	37	0.0453	1000.091	999.9539	.2728	.4885
N2_Link	397.6640	4.9708	48.0000	20.6357	12	49	1.7094	12	45	0.0519	1001.071	1000.610	.2679	.4025
NE3_Link	397.6640	4.9708	48.0000	31.1014	12	45	2.1353	12	37	0.0782	1000.303	999.8310	.3257	.4578
NE2_Link	397.6640	4.9708	48.0000	20.3642	12	51	1.5536	13	4	0.0512	1000.066	999.8310	.2664	.4578
Link112	397.6640	4.9708	48.0000	116.0529	12	51	2.5451	12	57	0.2918	999.6266	999.3437	.6567	.8359
Link114	397.6640	4.9708	48.0000	138.0143	12	45	2.9110	12	41	0.3471	999.7250	999.3437	.6812	.8359
Link115	397.6640	4.9708	48.0000	248.9838	12	48	5.1689	12	48	0.6261	999.3437	997.5431	.8359	.6358
Link116	397.6640	4.9708	48.0000	66.1577	12	51	2.2952	12	59	0.1664	999.9538	999.6266	.4885	.6567
N_Combine	397.6640	4.9708	48.0000	49.0493	12	52	2.5413	12	57	0.1233	1000.610	999.9538	.4025	.4885
NE_Combine	397.6640	4.9708	48.0000	49.8070	12	48	2.0492	12	27	0.1252	999.8310	999.6266	.4578	.6567
E_Combine	397.6640	4.9708	48.0000	38.4777	12	44	1.4215	12	30	0.0968	999.8294	999.7250	.4574	.6812
FREE # 1	Undefnd	Undefnd	Undefn	248.9844	12	48								

Table E11. Area assumptions used in the analysis

| Subcritical and Critical flow assumptions from |
| Subroutine Head. See Figure 17-1 in the |
| manual for further information. |

Conduit Name	Duration of Dry Flow(min)	Duration of Sub-Critical Flow(min)	Durat. of Upstream Critical Flow(min)	Durat. of Downstream Critical Flow(min)	Maximum Hydraulic Radius-m	Maximum X-Sect Area(ft^2)	Maximum Vel*D (ft^2/s)
SW2_Link	952.6667	1927.3333	0.0000	0.0000	0.7560	10.4893	2.5852
SW1_Link	960.0000	1920.0000	0.0000	0.0000	0.6141	7.6350	0.9697
SW_Combine	730.3333	2149.6667	0.0000	0.0000	0.9472	16.4146	2.9366
SE2_Link	318.3333	2561.6667	0.0000	0.0000	1.0165	18.4484	4.0148
Link97	135.5000	2744.5000	0.0000	0.0000	1.2061	25.5331	5.8897
SE1_Link	308.8333	2571.1667	0.0000	0.0000	1.0694	20.8968	2.5713
Link99	130.5000	2749.5000	0.0000	0.0000	1.4061	34.4703	7.2683
E1_Link	318.1667	2561.8333	0.0000	0.0000	0.9195	15.4734	2.8408
NE1_Link	952.8333	1927.1667	0.0000	0.0000	0.8175	13.0777	1.2524
NW1_Link	342.8333	2537.1667	0.0000	0.0000	0.6758	8.5165	2.2760
N1_Link	901.0000	1979.0000	0.0000	0.0000	0.8732	13.8302	3.0110
Link106	570.1667	2309.8333	0.0000	0.0000	0.9025	15.3992	1.8281
N2_Link	306.1667	2573.8333	0.0000	0.0000	0.8161	12.3883	2.2341
NE3_Link	313.3333	2566.6667	0.0000	0.0000	0.9320	15.8003	3.0956
NE2_Link	284.8333	2595.1667	0.0000	0.0000	0.8668	14.1610	2.0990
Link112	140.1667	2739.8333	0.0000	0.0000	1.6444	47.0782	7.4041
Link114	144.0000	2736.0000	0.0000	0.0000	1.6708	48.4274	8.6819
Link115	151.3333	2728.6667	0.0000	0.0000	1.6615	48.1707	15.2137
Link116	161.1667	2718.8333	0.0000	0.0000	1.2991	29.8262	5.1001
N_Combine	138.2500	2741.7500	0.0000	0.0000	1.0507	19.6009	4.4607
NE_Combine	130.5000	2749.5000	0.0000	0.0000	1.2653	28.5503	3.8912
E_Combine	132.9167	2747.0833	0.0000	0.0000	1.2868	29.6568	2.9681

Table E12. Mean Conduit Flow Information

Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
SW2_Link	0.6712	115974.95	0.0264	0.6692	0.1097	0.0710	0.5294	0.0500
SW1_Link	0.2158	37289.381	0.0089	0.6666	0.0716	0.0553	0.3858	0.0500
SW_Combine	0.8872	153302.90	0.0352	0.7464	0.1118	0.1024	0.8942	0.0500
SE2_Link	1.5490	267662.85	0.0504	0.8894	0.1798	0.1229	1.0861	0.0500
Link97	2.4364	421014.36	0.0841	0.9528	0.1953	0.1478	1.4497	0.0500
SE1_Link	1.0208	176388.62	0.0340	0.8927	0.1378	0.1283	1.1515	0.0500
Link99	3.4574	597430.94	0.1171	0.9546	0.2265	0.1749	1.8850	0.0500
E1_Link	0.9671	167113.08	0.0332	0.8894	0.1811	0.0977	0.7652	0.0500
NE1_Link	0.3340	57715.039	0.0132	0.6691	0.0693	0.0737	0.5628	0.0500
NW1_Link	0.6203	107186.23	0.0215	0.8809	0.5044	0.0656	0.4651	0.0500
N1_Link	1.1844	204670.86	0.0338	0.6871	0.1053	0.1031	0.8901	0.0500
Link106	0.6206	107248.26	0.0211	0.8019	0.0817	0.0969	0.8551	0.0500
N2_Link	0.7854	135717.93	0.0241	0.8936	0.1581	0.1003	0.8103	0.0500
NE3_Link	1.1346	196062.77	0.0362	0.8911	0.1645	0.1187	0.9530	0.0500
NE2_Link	0.8260	142730.15	0.0239	0.9010	0.1496	0.1110	0.8702	0.0500
Link112	4.5549	787079.35	0.1356	0.9512	0.1646	0.2299	2.9471	0.0500
Link114	4.7609	822690.18	0.1611	0.9499	0.1586	0.2293	2.9639	0.0500
Link115	9.3151	1609649.1	0.2901	0.9473	0.7269	0.2329	3.0668	0.0500
Link116	2.5920	447906.20	0.0771	0.9440	0.1695	0.1597	1.6846	0.0500
N_Combine	1.9708	340550.10	0.0572	0.9519	0.2171	0.1277	1.1972	0.0500
NE_Combine	1.9613	338917.13	0.0581	0.9546	0.1813	0.1600	1.5971	0.0500
E_Combine	1.3021	225006.74	0.0455	0.9538	0.1299	0.1425	1.4505	0.0500
FREE # 1	9.3161	1609827.4						

Table E18 - Junction Continuity Error. Division by Volume added 11/96
Continuity Error = Net Flow + Beginning Volume - Ending Volume
----
Total Flow + (Beginning Volume + Ending Volume)/2
Net Flow = Node Inflow - Node Outflow
Total Flow = absolute (Inflow + Outflow)
Intermediate column is a judgement on the node continuity error.
Excellent < 1 percent Great 1 to 2 percent Good 2 to 5 percent
Fair 5 to 10 percent Poor 10 to 25 percent Bad 25 to 50 percent
Terrible > 50 percent

Junction Name	<------Continuity Error -------> Volume	% of Node	% of Inflow	Remaining Volume	Beginning Volume	Net Flow Thru Node	Total Flow Thru Node	Failed to Converge
McGaw_NE1	-21.3875	-0.0185	0.0013	0.0026	0.0000	-21.3848	115413.8989	0
McGaw_E1	-26.7660	-0.0080	0.0017	0.0026	0.0000	-26.7633	334218.6153	0
McGaw_SE1	-39.0391	-0.0111	0.0024	0.0081	0.0000	-39.0310	352755.6107	0
McGaw_SE2	-22.7607	-0.0043	0.0014	0.0055	0.0000	-22.7553	535331.6986	0
McGaw_SW1	-17.0002	-0.0228	0.0011	0.0025	0.0000	-16.9976	74565.1027	0
McGaw_NE3	-31.2212	-0.0080	0.0019	0.0028	0.0000	-31.2183	392110.3226	0
McGaw_NE2	2.6298	0.0009	0.0002	0.0028	0.0000	2.6326	285475.1394	0
McGaw_NW1	-46.4350	-0.0217	0.0029	0.0020	0.0000	-46.4330	214337.9875	0
McGaw_N1	-13.5928	-0.0033	0.0008	0.0028	0.0000	-13.5899	409355.7807	0
McGaw_N2	-37.7244	-0.0139	0.0023	0.0028	0.0000	-37.7216	271413.6699	0
McGaw_SW2	-26.1463	-0.0113	0.0016	0.0025	0.0000	-26.1437	231935.0704	0
Node37	-52.7699	-0.0172	0.0033	0.0145	0.0000	-52.7554	306567.2302	0
Node38	-90.8853	-0.0108	0.0057	0.0322	0.0000	-90.8531	841980.1121	0
Node39	-55.9250	-0.0047	0.0035	0.0526	0.0000	-55.8724	1194833.916	0
Node41	-337.1015	-0.0205	0.0210	0.1175	0.0000	-336.9840	1645127.858	0
Node42	-68.4758	-0.0319	0.0043	0.0123	0.0000	-68.4635	214434.4880	0
Node43	-281.1037	-0.0314	0.0175	0.0459	0.0000	-281.0578	895704.5578	0
Node45	-440.8451	-0.0280	0.0274	0.1108	0.0000	-440.7343	1573902.673	0
Node47	-296.7919	-0.0092	0.0185	0.1951	0.0000	-296.5968	3219418.675	0
Out	-249.8847	-0.0078	0.0155	0.0466	0.0000	-249.8381	3219476.542	0
Node49	-189.5764	-0.0278	0.0118	0.0176	0.0000	-189.5588	680938.8892	0
Node50	-114.3810	-0.0169	0.0071	0.0224	0.0000	-114.3587	677710.0456	0
Node51	-177.2838	-0.0394	0.0110	0.0230	0.0000	-177.2608	449834.8603	0

The total continuity error was -2634.5 cubic feet
The remaining total volume was 0.72762 cubic feet
Your mean node continuity error was Excellent
Your worst node continuity error was Excellent

Selected XP-SWMM Output, Predevelopment Conditions, 100-year event
Neighborhood-only model for detention storage calculations

```
#####################################
# Rainfall input summary from Runoff #
#####################################

 Total rainfall for gage #     1 is    2.9000 inches


        ################################################
        # Table R9. Summary Statistics for Subcatchments #
        ################################################

 Note: Total Runoff Depth includes pervious & impervious area
       Pervious and Impervious Runoff Depth is only the runoff from those two areas.
```

Subcatchment.....	McGaw_SW2#2	McGaw_SW1#2	McGaw_SE2#1	McGaw_SE2#2	McGaw_SE1#1	McGaw_SE1#2
Area (acres).....	59.30400	17.74300	4.08100	135.50300	8.56900	49.69400
Percent Impervious.....	0.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.53866	0.57875	0.00000	0.46341	0.00000	0.51538
Total Losses (in).....	2.36134	2.32125	0.00000	2.43659	0.00000	2.38462
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	22.58532	7.65578	0.00000	36.03235	0.00000	14.24576
Total Impervious Area						
Total Runoff Depth (in)	0.00000	0.00000	2.68193	0.00000	2.68113	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	7.75285	0.00000	15.53484	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	0.53866	0.57875	2.68193	0.46341	2.68113	0.51538
Peak Runoff Rate (cfs).	22.58532	7.65578	7.75285	36.03235	15.53484	14.24576
Unit Runoff (in/hr)....	0.38084	0.43148	1.89974	0.26592	1.81291	0.28667
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_E1#1	McGaw_E1#2	McGaw_NE1#2	McGaw_NW1#1	McGaw_NW1#2	McGaw_N1#2
Area (acres).....	3.37700	68.40100	26.42000	0.02200	51.07300	97.46400
Percent Impervious.....	100.00000	0.00000	0.00000	100.00000	0.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.54100	0.60163	0.00000	0.57681	0.57854
Total Losses (in).....	0.00000	2.35900	2.29837	0.00000	2.32319	2.32146
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	22.45445	11.45166	0.00000	18.37636	29.00263
Total Impervious Area						
Total Runoff Depth (in)	2.67377	0.00000	0.00000	2.67377	0.00000	0.00000
Peak Runoff Rate (cfs).	6.31965	0.00000	0.00000	0.04117	0.00000	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.67377	0.54100	0.60163	2.67377	0.57681	0.57854
Peak Runoff Rate (cfs).	6.31965	22.45445	11.45166	0.04117	18.37636	29.00263
Unit Runoff (in/hr)....	1.87138	0.32828	0.43345	1.87138	0.35981	0.29757
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#1	McGaw_N2#2	McGaw_NE3#1	McGaw_NE3#2	McGaw_NE2#1	McGaw_NE2#2
Area (acres).....	2.41500	59.01300	9.17900	70.61900	8.01300	38.08500
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.52361	0.00000	0.41677	0.00000	0.46759
Total Losses (in).....	0.00000	2.37639	0.00000	2.48323	0.00000	2.43241
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	16.65942	0.00000	15.22816	0.00000	8.00071
Total Impervious Area						

Total Runoff Depth (in)	2.68399	0.00000	2.67736	0.00000	2.68509	0.00000
Peak Runoff Rate (cfs).	4.25820	0.00000	16.92503	0.00000	12.92345	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.68399	0.52361	2.67736	0.41677	2.68509	0.46759
Peak Runoff Rate (cfs).	4.25820	16.65942	16.92503	15.22816	12.92345	8.00071
Unit Runoff (in/hr)....	1.76323	0.28230	1.84389	0.21564	1.61281	0.21008
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

===> Runoff simulation ended normally.

===
| Table E10 - CONDUIT SUMMARY STATISTICS |
| Note: The peak flow may be less than the design flow |
| and the conduit may still surcharge because of the |
| downstream boundary conditions. |
| |
| * denotes an open conduit that has been overtopped |
| this is a potential source of severe errors |
===

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Ends Upstream (ft)	Maximum Depth at Pipe Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS
SW2_Link	397.6640	4.9708	48.0000	22.5772	12	41	2.1577	12	39	0.0568	1002.119	1001.283	.2797	.3208
SW1_Link	397.6640	4.9708	48.0000	7.6431	12	39	1.0142	12	37	0.0192	1001.653	1001.283	.1632	.3208
SW_Combine	397.6640	4.9708	48.0000	30.1065	12	41	1.8745	12	38	0.0757	1001.283	1000.915	.3208	.4788
SE2_Link	397.6640	4.9708	48.0000	43.1253	12	44	2.3552	12	47	0.1084	1001.517	1000.915	.3794	.4788
Link97	397.6640	4.9708	48.0000	71.9501	12	43	2.8388	12	41	0.1809	1000.915	1000.263	.4788	.5656
SE1_Link	397.6640	4.9708	48.0000	29.1179	12	46	1.4428	12	33	0.0732	1000.426	1000.263	.3565	.5656
Link99	397.6640	4.9708	48.0000	100.3580	12	44	2.9525	12	42	0.2524	1000.262	999.7250	.5656	.6812
E1_Link	397.6640	4.9708	48.0000	28.4991	12	44	1.9116	12	33	0.0717	1000.250	999.8294	.3126	.4574
NE1_Link	397.6640	4.9708	48.0000	11.2538	12	39	1.1603	12	31	0.0283	999.9009	999.8294	.2252	.4574
NW1_Link	397.6640	4.9708	48.0000	18.4142	12	45	2.2481	12	43	0.0463	1001.014	1000.091	.2535	.2728
N1_Link	397.6640	4.9708	48.0000	28.9993	12	53	2.1061	12	55	0.0729	1001.261	1000.610	.3152	.4025
Link106	397.6640	4.9708	48.0000	18.0121	12	46	1.3514	12	37	0.0453	1000.091	999.9539	.2728	.4885
N2_Link	397.6640	4.9708	48.0000	20.6357	12	49	1.7094	12	45	0.0519	1001.071	1000.610	.2679	.4025
NE3_Link	397.6640	4.9708	48.0000	31.1014	12	45	2.1353	12	37	0.0782	1000.303	999.8310	.3257	.4578
NE2_Link	397.6640	4.9708	48.0000	20.3642	12	51	1.5536	13	4	0.0512	1000.066	999.8310	.2664	.4578
Link112	397.6640	4.9708	48.0000	116.0529	12	51	2.5451	12	57	0.2918	999.6266	999.3437	.6567	.8359
Link114	397.6640	4.9708	48.0000	138.0143	12	45	2.9110	12	41	0.3471	999.7250	999.3437	.6812	.8359
Link115	397.6640	4.9708	48.0000	248.9838	12	48	5.1689	12	48	0.6261	999.3437	997.5431	.8359	.6358
Link116	397.6640	4.9708	48.0000	66.1577	12	51	2.2952	12	59	0.1664	999.9538	999.6266	.4885	.6567
N_Combine	397.6640	4.9708	48.0000	49.0493	12	52	2.5413	12	57	0.1233	1000.610	999.9538	.4025	.4885
NE_Combine	397.6640	4.9708	48.0000	49.8070	12	48	2.0492	12	27	0.1252	999.8310	999.6266	.4578	.6567
E_Combine	397.6640	4.9708	48.0000	38.4777	12	44	1.4215	12	30	0.0968	999.8294	999.7250	.4574	.6812
FREE # 1	Undefnd	Undefnd	Undefn	248.9844	12	48								

===
| Table E12. Mean Conduit Flow Information |
===

Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
SW2_Link	0.6712	115974.95	0.0264	0.6692	0.1097	0.0710	0.5294	0.0500
SW1_Link	0.2158	37289.381	0.0089	0.6666	0.0716	0.0553	0.3858	0.0500
SW_Combine	0.8872	153302.90	0.0352	0.7464	0.1118	0.1024	0.8942	0.0500
SE2_Link	1.5490	267662.85	0.0504	0.8894	0.1798	0.1229	1.0861	0.0500
Link97	2.4364	421014.36	0.0841	0.9528	0.1953	0.1478	1.4497	0.0500
SE1_Link	1.0208	176388.62	0.0340	0.8927	0.1378	0.1283	1.1515	0.0500
Link99	3.4574	597430.94	0.1171	0.9546	0.2265	0.1749	1.8850	0.0500
E1_Link	0.9671	167113.08	0.0332	0.8894	0.1811	0.0977	0.7652	0.0500
NE1_Link	0.3340	57715.039	0.0132	0.6691	0.0693	0.0737	0.5628	0.0500
NW1_Link	0.6203	107186.23	0.0215	0.8809	0.5044	0.0656	0.4651	0.0500
N1_Link	1.1844	204670.86	0.0338	0.6871	0.1053	0.1031	0.8901	0.0500
Link106	0.6206	107248.26	0.0211	0.8019	0.0817	0.0969	0.8551	0.0500
N2_Link	0.7854	135717.93	0.0241	0.8936	0.1581	0.1003	0.8103	0.0500
NE3_Link	1.1346	196062.77	0.0362	0.8911	0.1645	0.1187	0.9530	0.0500
NE2_Link	0.8260	142730.15	0.0239	0.9010	0.1496	0.1110	0.8702	0.0500
Link112	4.5549	787079.35	0.1356	0.9512	0.1646	0.2299	2.9471	0.0500
Link114	4.7609	822690.18	0.1611	0.9499	0.1586	0.2293	2.9639	0.0500
Link115	9.3151	1609649.1	0.2901	0.9473	0.7269	0.2329	3.0668	0.0500
Link116	2.5920	447906.20	0.0771	0.9440	0.1695	0.1597	1.6846	0.0500
N_Combine	1.9708	340550.10	0.0572	0.9519	0.2171	0.1277	1.1972	0.0500
NE_Combine	1.9613	338917.13	0.0581	0.9546	0.1813	0.1600	1.5971	0.0500
E_Combine	1.3021	225006.74	0.0455	0.9538	0.1299	0.1425	1.4505	0.0500
FREE # 1	9.3161	1609827.4						

Selected XP-SWMM Output, Post-development Conditions, 2-year event
Neighborhood-only model for detention storage calculations

```
 *=========================================================*
 |         RUNOFF TABLES IN THE OUTPUT FILE.               |
 |  These are the more important tables in the output file. |
 |  You can use your editor to find the table numbers,      |
 |  for example: search for Table R3 to check continuity.   |
 |  This output file can be imported into a Word Processor  |
 |  and printed on US letter or A4 paper using portrait     |
 |  mode, courier font, a size of 8 pt. and margins of 0.75 |
 |                                                          |
 | Table R1  - Physical Hydrology Data                      |
 | Table R2  - Infiltration data                            |
 | Table R3  - Raingage and Infiltration Database Names     |
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 | Table R5  - Continuity Check for Surface Water           |
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 | Table R8  - Infiltration/Inflow Continuity Check         |
 | Table R9  - Summary Statistics for Subcatchments         |
 | Table R10 - Sensitivity anlysis for Subcatchments        |
 *=========================================================*

####################################
# Rainfall input summary from Runoff #
####################################

 Total rainfall for gage #     1 is    2.9000 inches

  ###################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A    #
  #            Physical Hydrology Data              #
  ###################################################
```

Number	Subcatchment Name	Channel or inlet	Width (ft)	Area (ac)	Per-cent Imperv	Slope ft/ft	"n" Imprv	"n" Perv	Deprs-sion Storge Imprv	Deprs-sion Strge Perv	Prcnt Zero Deten-tion
1	McGaw_SW2#1	McGaw_SW2	1.0000	41.120	100.00	0.100	0.020	0.020	0.000	0.000	0.00
2	McGaw_SW2#2	McGaw_SW2	1.0000	18.320	0.00	0.100	0.020	0.020	0.000	0.000	0.00
3	McGaw_SW1#1	McGaw_SW1	1.0000	9.2200	100.00	0.100	0.020	0.020	0.000	0.000	0.00
4	McGaw_SW1#2	McGaw_SW1	1.0000	7.9000	0.00	0.100	0.020	0.020	0.000	0.000	0.00
5	McGaw_SE2#1	McGaw_SE2	1.0000	51.900	100.00	0.100	0.020	0.020	0.000	0.000	0.00
6	McGaw_SE2#2	McGaw_SE2	1.0000	87.780	0.00	0.100	0.020	0.020	0.000	0.000	0.00
7	McGaw_SE1#1	McGaw_SE1	1.0000	11.930	100.00	0.100	0.020	0.020	0.000	0.000	0.00
8	McGaw_SE1#2	McGaw_SE1	1.0000	46.240	0.00	0.100	0.020	0.020	0.000	0.000	0.00
9	McGaw_NE1#1	McGaw_NE1	1.0000	17.100	100.00	0.100	0.020	0.020	0.000	0.000	0.00
10	McGaw_NE1#2	McGaw_NE1	1.0000	9.2400	0.00	0.100	0.020	0.020	0.000	0.000	0.00
11	McGaw_E1#1	McGaw_E1	1.0000	32.820	100.00	0.100	0.020	0.020	0.000	0.000	0.00
12	McGaw_E1#2	McGaw_E1	1.0000	34.680	0.00	0.100	0.020	0.020	0.000	0.000	0.00
13	McGaw_NW1#1	McGaw_NW1	1.0000	44.950	100.00	0.100	0.020	0.020	0.000	0.000	0.00
14	McGaw_NW1#2	McGaw_NW1	1.0000	6.1000	0.00	0.100	0.020	0.020	0.000	0.000	0.00
15	McGaw_N1#1	McGaw_N1	1.0000	65.180	100.00	0.100	0.020	0.020	0.000	0.000	0.00
16	McGaw_N1#2	McGaw_N1	1.0000	32.310	0.00	0.100	0.020	0.020	0.000	0.000	0.00
17	McGaw_N2#1	McGaw_N2	1.0000	27.940	100.00	0.100	0.020	0.020	0.000	0.000	0.00
18	McGaw_N2#2	McGaw_N2	1.0000	33.510	0.00	0.100	0.020	0.020	0.000	0.000	0.00
19	McGaw_NE3#1	McGaw_NE3	1.0000	42.330	100.00	0.100	0.020	0.020	0.000	0.000	0.00
20	McGaw_NE3#2	McGaw_NE3	1.0000	37.320	0.00	0.100	0.020	0.020	0.000	0.000	0.00
21	McGaw_NE2#1	McGaw_NE2	1.0000	35.110	100.00	0.100	0.020	0.020	0.000	0.000	0.00
22	McGaw_NE2#2	McGaw_NE2	1.0000	11.150	0.00	0.100	0.020	0.020	0.000	0.000	0.00

```
#########################################################################################################
#          Table R2.  SUBCATCHMENT  DATA                                                               #
#                     Infiltration or Time of Concentration Data                                      #
#                                                                                                     #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)             Infl #4(#8)  #
# SCS                 ->   Comp CN          Time Conc         Shape Factor        Depth or Fraction  #
# SBUH                ->   Comp CN          Time Conc                  N/A                      N/A  #
# Green Ampt          ->   Suction          Hydr Cond          Initial MD                       N/A  #
# Horton              ->  Max Rate           Min Rate   Decay Rate (1/sec)      Max. Infilt. Volume  #
# Proportional        ->  Constant               N/A                  N/A                      N/A  #
# Initial/Cont Loss   ->   Initial         Continuing                  N/A                      N/A  #
# Initial/Proportional ->  Initial           Constant                  N/A                      N/A  #
```

```
# Laurenson Parameters ->   B Value       Pervious "n"      Impervious Cont                 Exponent  #
# Rational Formula     -> Tc Method   Flow Path Length      Flow Path Slope  Roughness or Retardance  #
#                              (#1 - #4 is Impervious Data / #5 - #8 is Pervious Data)              #
#                     Rational Formula Tc Method: 1 = Constant                                      #
#                                                 2 = Friend's Equation                             #
#                                                 3 = Kinematic Wave                                #
#                                                 4 = Alameda Method                                #
#                                                 5 = Izzard's Formula                              #
#                                                 6 = Kerby's Equation                              #
#                                                 7 = Kirpich's Equation                            #
#                                                 8 = Bransby Williams Equation                     #
#                                                 9 = Federal Aviation Authority Equation           #
#########################################################################################################
```

Subcatchment Number	Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	McGaw_SW2#1	98.0000	0.1750	484.0000	0.2000				
2	McGaw_SW2#2	61.0000	0.1750	484.0000	0.2000				
3	McGaw_SW1#1	98.0000	0.1667	484.0000	0.2000				
4	McGaw_SW1#2	61.0000	0.1667	484.0000	0.2000				
5	McGaw_SE2#1	98.0000	0.2250	484.0000	0.2000				
6	McGaw_SE2#2	61.0000	0.2250	484.0000	0.2000				
7	McGaw_SE1#1	98.0000	0.5167	484.0000	0.2000				
8	McGaw_SE1#2	67.0000	0.5167	484.0000	0.2000				
9	McGaw_NE1#1	98.0000	0.1833	484.0000	0.2000				
10	McGaw_NE1#2	61.0000	0.1833	484.0000	0.2000				
11	McGaw_E1#1	98.0000	0.2333	484.0000	0.2000				
12	McGaw_E1#2	61.0000	0.2333	484.0000	0.2000				
13	McGaw_NW1#1	98.0000	0.2333	484.0000	0.2000				
14	McGaw_NW1#2	61.0000	0.2333	484.0000	0.2000				
15	McGaw_N1#1	98.0000	0.3167	484.0000	0.2000				
16	McGaw_N1#2	61.0000	0.3167	484.0000	0.2000				
17	McGaw_N2#1	98.0000	0.2750	484.0000	0.2000				
18	McGaw_N2#2	61.0000	0.2750	484.0000	0.2000				
19	McGaw_NE3#1	98.0000	0.2417	484.0000	0.2000				
20	McGaw_NE3#2	61.0000	0.2417	484.0000	0.2000				
21	McGaw_NE2#1	98.0000	0.3333	484.0000	0.2000				
22	McGaw_NE2#2	61.0000	0.3333	484.0000	0.2000				

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Subcatchment Number	Name	Gage No	Infiltration Type	Routing Type	Rainfall Database Name	Infiltration Database Name
1	McGaw_SW2#1	1	SCS Method	SCS curvilinear		
2	McGaw_SW2#2	1	SCS Method	SCS curvilinear		
3	McGaw_SW1#1	1	SCS Method	SCS curvilinear		
4	McGaw_SW1#2	1	SCS Method	SCS curvilinear		
5	McGaw_SE2#1	1	SCS Method	SCS curvilinear		
6	McGaw_SE2#2	1	SCS Method	SCS curvilinear		
7	McGaw_SE1#1	1	SCS Method	SCS curvilinear		
8	McGaw_SE1#2	1	SCS Method	SCS curvilinear		
9	McGaw_NE1#1	1	SCS Method	SCS curvilinear		
10	McGaw_NE1#2	1	SCS Method	SCS curvilinear		
11	McGaw_E1#1	1	SCS Method	SCS curvilinear		
12	McGaw_E1#2	1	SCS Method	SCS curvilinear		
13	McGaw_NW1#1	1	SCS Method	SCS curvilinear		
14	McGaw_NW1#2	1	SCS Method	SCS curvilinear		
15	McGaw_N1#1	1	SCS Method	SCS curvilinear		
16	McGaw_N1#2	1	SCS Method	SCS curvilinear		
17	McGaw_N2#1	1	SCS Method	SCS curvilinear		
18	McGaw_N2#2	1	SCS Method	SCS curvilinear		
19	McGaw_NE3#1	1	SCS Method	SCS curvilinear		
20	McGaw_NE3#2	1	SCS Method	SCS curvilinear		
21	McGaw_NE2#1	1	SCS Method	SCS curvilinear		
22	McGaw_NE2#2	1	SCS Method	SCS curvilinear		

```
 Total Number of Subcatchments...            22
 Total Tributary Area (acres)....        704.15
 Impervious Area (acres).........        379.60
 Pervious Area (acres)...........        324.55
 Total Width (feet)..............         22.00
 Percent Imperviousness..........         53.91

        ##################################################
```

Table R9. Summary Statistics for Subcatchments

Note: Total Runoff Depth includes pervious & impervious area
Pervious and Impervious Runoff Depth is only the runoff from those two areas.

Subcatchment	McGaw_SW2#1	McGaw_SW2#2	McGaw_SW1#1	McGaw_SW1#2	McGaw_SE2#1	McGaw_SE2#2
Area (acres)	41.12000	18.32000	9.22000	7.90000	51.90000	87.78000
Percent Impervious	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.32970	0.00000	0.33035	0.00000	0.32751
Total Losses (in)	0.00000	2.57030	0.00000	2.56965	0.00000	2.57249
Remaining Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	4.71580	0.00000	2.05841	0.00000	19.83146
Total Impervious Area						
Total Runoff Depth (in)	2.68271	0.00000	2.68802	0.00000	2.66492	0.00000
Peak Runoff Rate (cfs)	90.49316	0.00000	20.35295	0.00000	112.18135	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.68271	0.32970	2.68802	0.33035	2.66492	0.32751
Peak Runoff Rate (cfs)	90.49316	4.71580	20.35295	2.05841	112.18135	19.83146
Unit Runoff (in/hr)	2.20071	0.25741	2.20748	0.26056	2.16149	0.22592
Rational Formula						
Pervious Tc. (mins)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment	McGaw_SE1#1	McGaw_SE1#2	McGaw_NE1#1	McGaw_NE1#2	McGaw_E1#1	McGaw_E1#2
Area (acres)	11.93000	46.24000	17.10000	9.24000	32.82000	34.68000
Percent Impervious	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.53858	0.00000	0.32797	0.00000	0.32815
Total Losses (in)	0.00000	2.36142	0.00000	2.57203	0.00000	2.57185
Remaining Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	14.14310	0.00000	2.31357	0.00000	7.68249
Total Impervious Area						
Total Runoff Depth (in)	2.68113	0.00000	2.66861	0.00000	2.67013	0.00000
Peak Runoff Rate (cfs)	21.62803	0.00000	37.38346	0.00000	70.90297	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.68113	0.53858	2.66861	0.32797	2.67013	0.32815
Peak Runoff Rate (cfs)	21.62803	14.14310	37.38346	2.31357	70.90297	7.68249
Unit Runoff (in/hr)	1.81291	0.30586	2.18617	0.25039	2.16036	0.22153
Rational Formula						
Pervious Tc. (mins)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NW1#1	McGaw_NW1#2	McGaw_N1#1	McGaw_N1#2	McGaw_N2#1	McGaw_N2#2
Area (acres).....	44.95000	6.10000	65.18000	32.31000	27.94000	33.51000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.32815	0.00000	0.32911	0.00000	0.33138
Total Losses (in).....	0.00000	2.57185	0.00000	2.57089	0.00000	2.56862
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	1.35130	0.00000	6.08142	0.00000	6.92457
Total Impervious Area						

Total Runoff Depth (in)	2.67013	0.00000	2.67792	0.00000	2.69636	0.00000
Peak Runoff Rate (cfs).	97.10812	0.00000	135.33525	0.00000	59.92114	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.67013	0.32815	2.67792	0.32911	2.69636	0.33138
Peak Runoff Rate (cfs).	97.10812	1.35130	135.33525	6.08142	59.92114	6.92457
Unit Runoff (in/hr)....	2.16036	0.22153	2.07633	0.18822	2.14464	0.20664
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NE3#1	McGaw_NE3#2	McGaw_NE2#1	McGaw_NE2#2
Area (acres).....	42.33000	37.32000	35.11000	11.15000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400
Pervious Area				

Total Runoff Depth (in)	0.00000	0.33890	0.00000	0.32970
Total Losses (in).....	0.00000	2.56110	0.00000	2.57030
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	8.34282	0.00000	2.04612
Total Impervious Area				

Total Runoff Depth (in)	2.75762	0.00000	2.68276	0.00000
Peak Runoff Rate (cfs).	94.20352	0.00000	72.45226	0.00000
Impervious Area with depression storage				

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage				

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000
Total Area				

Total Runoff Depth (in)	2.75762	0.33890	2.68276	0.32970
Peak Runoff Rate (cfs).	94.20352	8.34282	72.45226	2.04612
Unit Runoff (in/hr)....	2.22546	0.22355	2.06358	0.18351
Rational Formula				

```
Pervious Tc. (mins)....          0.00000          0.00000          0.00000          0.00000
Perv. Intensity (in/hr)          0.00000          0.00000          0.00000          0.00000
Pervious C ............          0.00000          0.00000          0.00000          0.00000
Impervious Tc. (mins)..          0.00000          0.00000          0.00000          0.00000
Imp. Intensity (in/hr).          0.00000          0.00000          0.00000          0.00000
Impervious C ..........          0.00000          0.00000          0.00000          0.00000
Partial Area (Ha)......          0.00000          0.00000          0.00000          0.00000
Partial Area Tc........          0.00000          0.00000          0.00000          0.00000
Partial Area Intensity.          0.00000          0.00000          0.00000          0.00000

===> Runoff simulation ended normally.

#######################################################
#    Entry made to the HYDRAULIC Layer(Block) of SWMM #
#    Last Updated October,2000 by XP Software         #

    Existing Land Use Conditions
    Fitchburg McGaw Park Neighborhood Plan


*=========================================================*
|        HYDRAULICS TABLES IN THE OUTPUT FILE             |
|  These are the more important tables in the output file.  |
|  You can use your editor to find the table numbers,       |
|  for example: search for Table E20 to check continuity.   |
|  This output file can be imported into a Word Processor   |
|  and printed on US letter or A4 paper using portrait      |
|  mode, courier font, a size of 8 pt. and margins of 0.75  |
|                                                           |
| Table E1   - Basic Conduit Data                           |
| Table E2   - Conduit Factor Data                          |
| Table E3a  - Junction Data                                |
| Table E3b  - Junction Data                                |
| Table E4   - Conduit Connectivity Data                    |
| Table E4a  - Dry Weather Flow Data                        |
| Table E4b  - Real Time Control Data                       |
| Table E5   - Junction Time Step Limitation Summary        |
| Table E5a  - Conduit Explicit Condition Summary           |
| Table E6   - Final Model Condition                        |
| Table E7   - Iteration Summary                            |
| Table E8   - Junction Time Step Limitation Summary        |
| Table E9   - Junction  Summary  Statistics                |
| Table E10  - Conduit   Summary  Statistics                |
| Table E11  - Area assumptions used in the analysis        |
| Table E12  - Mean conduit information                     |
| Table E13  - Channel losses(H) and culvert info           |
| Table E13a - Culvert Analysis Classification              |
| Table E14  - Natural Channel Overbank Flow Information    |
| Table E14a - Natural Channel Encroachment Information     |
| Table E14b - Floodplain Mapping                           |
| Table E15  - Spreadsheet Info List                        |
| Table E15a - Spreadsheet Reach List                       |
| Table E16  - New Conduit Output Section                   |
| Table E17  - Pump Operation                               |
| Table E18  - Junction Continuity Error                    |
| Table E19  - Junction Inflow Sources                      |
| Table E20  - Junction Flooding and Volume List            |
| Table E21  - Continuity balance at simulation end         |
| Table E22  - Model Judgement Section                      |
*=========================================================*

*================================================*
|          Table E1 - Conduit Data               |
*================================================*
```

Inp Num	Conduit Name	Length (ft)	Conduit Class	Area (ft^2)	Manning Coef.	Max Width (ft)	Trapezoid Depth (ft)	Trapezoid Side Slopes	
1	SW_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
2	Link97	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
3	Link99	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
4	Link106	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
5	Link112	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
6	Link114	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
7	Link115	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
8	Link116	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
9	N_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
10	NE_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
11	E_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000

12	Link120	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
13	Link124	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
14	Link128	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
15	Link132	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
16	Link136	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
17	Link140	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
18	Link144	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
19	Link148	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
20	Link152	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
21	Link156	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
22	Link160	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
23	SE2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
24	SE1_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
25	NW1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
26	N1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
27	N2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
28	NE3_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
29	NE2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
30	NE1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
31	E1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
32	SE1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
33	SE2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
34	SW2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		
35	SW1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000		

Total length of all conduits .... 5700.0000 feet

Table E3a - Junction Data

Inp Num	Junction Name	Ground Elevation	Crown Elevation	Invert Elevation	Qinst cfs	Initial Depth-ft	Interface Flow (%)
1	McGaw_NE1	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
2	McGaw_E1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
3	McGaw_SE1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
4	McGaw_SE2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
5	McGaw_SW1	1015.0000	1013.0000	1009.0000	0.0000	0.0000	100.0000
6	McGaw_NE3	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
7	McGaw_NE2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
8	McGaw_NW1	1015.0000	1011.0000	1007.0000	0.0000	0.0000	100.0000
9	McGaw_N1	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
10	McGaw_N2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
11	McGaw_SW2	1015.0000	1011.0000	1007.0000	0.0000	0.0000	100.0000
12	Node37	1010.0000	999.5000	995.5000	0.0000	0.0000	100.0000
13	Node38	1010.0000	998.5000	994.5000	0.0000	0.0000	100.0000
14	Node39	1010.0000	997.5000	993.5000	0.0000	0.0000	100.0000
15	Node41	1010.0000	996.5000	992.5000	0.0000	0.0000	100.0000
16	Node42	1010.0000	998.5000	994.5000	0.0000	0.0000	100.0000
17	Node43	1010.0000	997.5000	993.5000	0.0000	0.0000	100.0000
18	Node45	1010.0000	996.5000	992.5000	0.0000	0.0000	100.0000
19	Node47	1010.0000	995.5000	991.5000	0.0000	0.0000	100.0000
20	Out	1010.0000	994.5000	990.5000	0.0000	0.0000	100.0000
21	Node49	1010.0000	998.5000	994.5000	0.0000	0.0000	100.0000
22	Node50	1010.0000	997.5000	993.5000	0.0000	0.0000	100.0000
23	Node51	1010.0000	997.5000	993.5000	0.0000	0.0000	100.0000
24	NW1_infil	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
25	NW1_det	1010.0000	1001.5000	1001.5000	0.0000	0.0000	100.0000
26	NW1_pump	1010.0000	1001.0000	1001.0000	0.0000	0.0000	100.0000
27	N1_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
28	N1_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
29	N1_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
30	N2_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
31	N2_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
32	N2_pump	1010.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
33	NE3_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
34	NE3_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
35	NE3_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
36	NE2_infil	1010.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
37	NE2_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
38	NE2_pump	1010.0000	1000.0000	1000.0000	0.0000	0.0000	100.0000
39	NE1_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
40	NE1_det	1015.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
41	NE1_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
42	E1_infil	1015.0000	1008.0000	1004.0000	0.0000	0.0000	100.0000
43	E1_det	1010.0000	999.5000	999.5000	0.0000	0.0000	100.0000
44	E1_pump	1010.0000	999.0000	999.0000	0.0000	0.0000	100.0000
45	SE1_infil	1015.0000	1008.0000	1004.0000	0.0000	0.0000	100.0000
46	SE1_det	1015.0000	999.5000	999.5000	0.0000	0.0000	100.0000

47	SE1_pump	1015.0000	1004.0000	1004.0000	0.0000	0.0000	100.0000
48	SE2_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
49	SE2_det	1015.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
50	SE2_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
51	SW2_infil	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
52	SW2_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
53	SW2_pump	1010.0000	1002.0000	1002.0000	0.0000	0.0000	100.0000
54	SW1_infil	1015.0000	1012.0000	1008.0000	0.0000	0.0000	100.0000
55	SW1_det	1015.0000	1003.5000	1003.5000	0.0000	0.0000	100.0000
56	SW1_pump	1015.0000	1008.0000	1008.0000	0.0000	0.0000	100.0000
57	Node89	1010.0000	999.5000	995.5000	0.0000	0.0000	100.0000
58	Node90	1010.0000	998.5000	994.5000	0.0000	0.0000	100.0000

Table E4 - Conduit Connectivity

Input Number	Conduit Name	Upstream Node	Downstream Node	Upstream Elevation	Downstream Elevation	
1	SW_Combine	Node37	Node38	995.5000	994.5000	No Design
2	Link97	Node38	Node39	994.5000	993.5000	No Design
3	Link99	Node39	Node41	993.5000	992.5000	No Design
4	Link106	Node42	Node43	994.5000	993.5000	No Design
5	Link112	Node45	Node47	992.5000	991.5000	No Design
6	Link114	Node41	Node47	992.5000	991.5000	No Design
7	Link115	Node47	Out	991.5000	990.5000	No Design
8	Link116	Node43	Node45	993.5000	992.5000	No Design
9	N_Combine	Node49	Node43	994.5000	993.5000	No Design
10	NE_Combine	Node50	Node45	993.5000	992.5000	No Design
11	E_Combine	Node51	Node41	993.5000	992.5000	No Design
12	Link120	McGaw_NW1	NW1_infil	1007.0000	1006.0000	No Design
13	Link124	McGaw_N1	N1_infil	1006.0000	1005.0000	No Design
14	Link128	McGaw_N2	N2_infil	1006.0000	1005.0000	No Design
15	Link132	McGaw_NE3	NE3_infil	1006.0000	1005.0000	No Design
16	Link136	McGaw_NE2	NE2_infil	1006.0000	1005.0000	No Design
17	Link140	McGaw_NE1	NE1_infil	1006.0000	1005.0000	No Design
18	Link144	McGaw_E1	E1_infil	1005.0000	1004.0000	No Design
19	Link148	McGaw_SE1	SE1_infil	1005.0000	1004.0000	No Design
20	Link152	McGaw_SE2	SE2_infil	1006.0000	1005.0000	No Design
21	Link156	McGaw_SW2	SW2_infil	1007.0000	1006.0000	No Design
22	Link160	McGaw_SW1	SW1_infil	1009.0000	1008.0000	No Design
23	SE2_Link	Node89	Node38	995.5000	994.5000	No Design
24	SE1_Link	Node90	Node39	994.5000	993.5000	No Design
25	NW1_vweir	NW1_det	Node42	1001.5000	994.5000	No Design
26	N1_vweir	N1_det	Node49	1000.5000	994.5000	No Design
27	N2_vweir	N2_det	Node49	1000.5000	994.5000	No Design
28	NE3_vweir	NE3_det	Node50	1000.5000	993.5000	No Design
29	NE2_vweir	NE2_det	Node50	1000.5000	993.5000	No Design
30	NE1_vweir	NE1_det	Node51	1000.5000	993.5000	No Design
31	E1_vweir	E1_det	Node51	999.5000	993.5000	No Design
32	SE1_vweir	SE1_det	Node90	999.5000	994.5000	No Design
33	SE2_vweir	SE2_det	Node89	1000.5000	995.5000	No Design
34	SW2_vweir	SW2_det	Node37	1000.5000	995.5000	No Design
35	SW1_vweir	SW1_det	Node37	1003.5000	995.5000	No Design

FREE OUTFALL DATA (DATA GROUP I1)
BOUNDARY CONDITION ON DATA GROUP J1

Outfall at Junction....Out has boundary condition number... 1

INTERNAL CONNECTIVITY INFORMATION

CONDUIT	JUNCTION	JUNCTION
NW1_Iweir	NW1_infil	NW1_det
NW1_Oweir	NW1_det	Node42
N1_Iweir	N1_infil	N1_det
N1_ovrweir	N1_det	Node49
N2_Iweir	N2_infil	N2_det
N2_ovrweir	N2_det	Node49
NE3_Iweir	NE3_infil	NE3_det
NE3_ovweir	NE3_det	Node50

```
       NE2_Iweir        NE2_infil          NE2_det
      NE2_ovweir          NE2_det           Node50
       NE1_Iweir        NE1_infil          NE1_det
      NE1_ovweir          NE1_det           Node51
        E1_Iweir         E1_infil           E1_det
       E1_ovrweir           E1_det           Node51
       SE1_Iweir        SE1_infil          SE1_det
      SE1_ovweir          SE1_det           Node90
       SE2_Iweir        SE2_infil          SE2_det
      SE2_ovweir          SE2_det           Node89
       SW2_Iweir        SW2_infil          SW2_det
      SW2_ovweir          SW2_det           Node37
       SW1_Iweir        SW1_infil          SW1_det
      SW1_ovweir          SW1_det           Node37
         NW1_inf        NW1_infil         NW1_pump
          N1_inf         N1_infil          N1_pump
          N2_inf         N2_infil          N2_pump
         NE3_inf        NE3_infil         NE3_pump
         NE2_inf        NE2_infil         NE2_pump
         NE1_inf        NE1_infil         NE1_pump
          E1_inf         E1_infil          E1_pump
         SE1_inf        SE1_infil         SE1_pump
         SE2_inf        SE2_infil         SE2_pump
         SW2_inf        SW2_infil         SW2_pump
         SW1_inf        SW1_infil         SW1_pump
        FREE # 1              Out         BOUNDARY

*====================================================*
|        Boundary Condition Information              |
|                 Data Groups J1-J4                  |
*====================================================*


BC NUMBER..         1 Control water surface elevation is..      0.00 feet.


############################################
# Header information from interface file: #
############################################

Title from first computational layer:
Existing Land Use Conditions
Montgomery Associates

Title from immediately preceding computational layer
Existing Land Use Conditions
Montgomery Associates

Name of preceding layer:.............        Runoff Layer
Initial Julian date (IDATEZ).....................   1993001
Initial time of day in seconds (TZERO)............       0.0
No. Transfered input locations...................        11
No. Transfered pollutants........................         0
Size of total catchment area (acres)..............    704.15

################################################
# Element numbers of interface inlet locations: #
################################################

McGaw_SW2        McGaw_SW1        McGaw_SE2        McGaw_SE1        McGaw_NE1        McGaw_E1         McGaw_NW1
McGaw_N1         McGaw_N2         McGaw_NE3        McGaw_NE2


*====================================================*
|        Table E9 - JUNCTION SUMMARY STATISTICS      |
| The Maximum area is only the area of the node, it  |
| does not include the area of the surrounding conduits|
*====================================================*

                          Uppermost   Maximum     Time        Feet of             Maximum   Maximum   Maximum   Maximum
                 Ground PipeCrown  Junction      of       Surcharge  Freeboard Junction    Gutter    Gutter    Gutter
       Junction   Elevation Elevation Elevation    Occurence     at Max   of node      Area     Depth     Width  Velocity
           Name        feet      feet      feet    Hr. Min.   Elevation      feet      ft^2      feet      feet      ft/s
---------------   ---------  --------  --------   ---------   ---------  --------  -------- --------- --------- ---------
      McGaw_NE1   1015.0000 1010.0000 1007.5394     12   19      0.0000    7.4606   12.5660    0.0000    0.0000    0.0000
       McGaw_E1   1015.0000 1009.0000 1007.1647     12   33      0.0000    7.8353   12.5660    0.0000    0.0000    0.0000
      McGaw_SE1   1015.0000 1009.0000 1006.4117     12   44      0.0000    8.5883   12.5660    0.0000    0.0000    0.0000
      McGaw_SE2   1015.0000 1010.0000 1008.6848     12   33      0.0000    6.3152   12.5660    0.0000    0.0000    0.0000
      McGaw_SW1   1015.0000 1013.0000 1010.1380     12   31      0.0000    4.8620   12.5660    0.0000    0.0000    0.0000
      McGaw_NE3   1015.0000 1010.0000 1008.4180     12   33      0.0000    6.5820   12.5660    0.0000    0.0000    0.0000
```

McGaw_NE2	1015.0000	1010.0000	1008.1117	12	33	0.0000	6.8883	12.5660	0.0000	0.0000	0.0000
McGaw_NW1	1015.0000	1011.0000	1009.4398	12	31	0.0000	5.5602	12.5660	0.0000	0.0000	0.0000
McGaw_N1	1015.0000	1010.0000	1008.8204	12	35	0.0000	6.1796	12.5660	0.0000	0.0000	0.0000
McGaw_N2	1015.0000	1010.0000	1008.0165	12	35	0.0000	6.9835	12.5660	0.0000	0.0000	0.0000
McGaw_SW2	1015.0000	1011.0000	1009.3917	12	31	0.0000	5.6083	12.5660	0.0000	0.0000	0.0000
Node37	1010.0000	999.5000	996.4519	13	16	0.0000	13.5481	12.5660	0.0000	0.0000	0.0000
Node38	1010.0000	998.5000	995.9681	13	22	0.0000	14.0319	12.5660	0.0000	0.0000	0.0000
Node39	1010.0000	997.5000	995.2369	13	17	0.0000	14.7631	12.5660	0.0000	0.0000	0.0000
Node41	1010.0000	996.5000	994.5352	13	23	0.0000	15.4648	12.5660	0.0000	0.0000	0.0000
Node42	1010.0000	998.5000	995.3535	14	13	0.0000	14.6465	12.5660	0.0000	0.0000	0.0000
Node43	1010.0000	997.5000	995.0625	13	47	0.0000	14.9375	12.5660	0.0000	0.0000	0.0000
Node45	1010.0000	996.5000	994.5036	13	36	0.0000	15.4964	12.5660	0.0000	0.0000	0.0000
Node47	1010.0000	995.5000	994.1692	13	29	0.0000	15.8308	12.5660	0.0000	0.0000	0.0000
Out	1010.0000	994.5000	992.4483	13	29	0.0000	17.5517	12.5660	0.0000	0.0000	0.0000
Node49	1010.0000	998.5000	995.8802	13	28	0.0000	14.1198	12.5660	0.0000	0.0000	0.0000
Node50	1010.0000	997.5000	994.7203	13	36	0.0000	15.2797	12.5660	0.0000	0.0000	0.0000
Node51	1010.0000	997.5000	994.6383	13	23	0.0000	15.3617	12.5660	0.0000	0.0000	0.0000
NW1_infil	1015.0000	1010.0000	1007.2960	12	46	0.0000	7.7040	133293.60	0.0000	0.0000	0.0000
NW1_det	1010.0000	1001.5000	1003.4324	14	13	1.9324	6.5676	56628.000	0.0000	0.0000	0.0000
NW1_pump	1010.0000	1001.0000	1001.0000	0	0	0.0000	9.0000	12.5660	0.0000	0.0000	0.0000
N1_infil	1015.0000	1009.0000	1006.2568	12	47	0.0000	8.7432	169884.00	0.0000	0.0000	0.0000
N1_det	1010.0000	1000.5000	1002.8522	13	55	2.3522	7.1478	87120.000	0.0000	0.0000	0.0000
N1_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
N2_infil	1015.0000	1009.0000	1006.1087	12	38	0.0000	8.8913	34848.000	0.0000	0.0000	0.0000
N2_det	1010.0000	1000.5000	1002.8227	13	1	2.3227	7.1773	39204.000	0.0000	0.0000	0.0000
N2_pump	1010.0000	1005.0000	1005.0000	0	0	0.0000	5.0000	12.5660	0.0000	0.0000	0.0000
NE3_infil	1015.0000	1009.0000	1006.3050	12	37	0.0000	8.6950	48787.200	0.0000	0.0000	0.0000
NE3_det	1010.0000	1000.5000	1002.6791	13	17	2.1791	7.3209	78408.000	0.0000	0.0000	0.0000
NE3_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
NE2_infil	1010.0000	1009.0000	1006.4286	12	47	0.0000	3.5714	64468.800	0.0000	0.0000	0.0000
NE2_det	1010.0000	1000.5000	1002.1407	14	0	1.6407	7.8593	69696.000	0.0000	0.0000	0.0000
NE2_pump	1010.0000	1000.0000	1000.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
NE1_infil	1015.0000	1009.0000	1006.2258	12	37	0.0000	8.7742	30927.600	0.0000	0.0000	0.0000
NE1_det	1015.0000	1000.5000	1001.8089	13	30	1.3089	13.1911	43560.000	0.0000	0.0000	0.0000
NE1_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
E1_infil	1015.0000	1008.0000	1005.1661	12	37	0.0000	9.8339	47044.800	0.0000	0.0000	0.0000
E1_det	1010.0000	999.5000	1001.3609	13	20	1.8609	8.6391	65340.000	0.0000	0.0000	0.0000
E1_pump	1010.0000	999.0000	999.0000	0	0	0.0000	11.0000	12.5660	0.0000	0.0000	0.0000
SE1_infil	1015.0000	1008.0000	1005.2631	12	47	0.0000	9.7369	5227.2000	0.0000	0.0000	0.0000
SE1_det	1015.0000	999.5000	1001.7277	13	9	2.2277	13.2723	26136.000	0.0000	0.0000	0.0000
SE1_pump	1015.0000	1004.0000	1004.0000	0	0	0.0000	11.0000	12.5660	0.0000	0.0000	0.0000
SE2_infil	1015.0000	1009.0000	1006.4020	12	38	0.0000	8.5980	85377.600	0.0000	0.0000	0.0000
SE2_det	1015.0000	1000.5000	1002.9744	13	24	2.4744	12.0256	87120.000	0.0000	0.0000	0.0000
SE2_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
SW2_infil	1015.0000	1010.0000	1007.1453	12	38	0.0000	7.8547	111513.60	0.0000	0.0000	0.0000
SW2_det	1010.0000	1000.5000	1002.3497	13	45	1.8497	7.6503	74052.000	0.0000	0.0000	0.0000
SW2_pump	1010.0000	1002.0000	1002.0000	0	0	0.0000	8.0000	12.5660	0.0000	0.0000	0.0000
SW1_infil	1015.0000	1012.0000	1009.0370	12	34	0.0000	5.9630	15246.000	0.0000	0.0000	0.0000
SW1_det	1015.0000	1003.5000	1005.2186	12	47	1.7186	9.7814	13068.000	0.0000	0.0000	0.0000
SW1_pump	1015.0000	1008.0000	1008.0000	0	0	0.0000	7.0000	12.5660	0.0000	0.0000	0.0000
Node89	1010.0000	999.5000	996.6539	13	24	0.0000	13.3461	12.5660	0.0000	0.0000	0.0000
Node90	1010.0000	998.5000	995.5166	13	9	0.0000	14.4834	12.5660	0.0000	0.0000	0.0000

```
*=====================================================*
|        Table E10 - CONDUIT SUMMARY STATISTICS        |
| Note: The peak flow may be less than the design flow |
| and the conduit may still surcharge because of the   |
| downstream boundary conditions.                      |
|                                                      |
| * denotes an open conduit that has been overtopped   |
|   this is a potential source of severe errors        |
*=====================================================*
```

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Ends Upstream (ft)	Maximum Depth at Pipe Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS
SW_Combine	397.6640	4.9708	48.0000	16.1827	13	16	1.6415	12	45	0.0407	996.4519	995.9681	.2380	.3670
Link97	397.6640	4.9708	48.0000	40.1524	13	22	2.4662	13	45	0.1010	995.9681	995.2369	.3670	.4342
Link99	397.6640	4.9708	48.0000	57.9261	13	17	2.7104	13	9	0.1457	995.2369	994.5352	.4342	.5088
Link106	397.6640	4.9708	48.0000	12.9771	14	13	1.2716	14	38	0.0326	995.3535	995.0625	.2134	.3906
Link112	397.6640	4.9708	48.0000	70.3554	13	44	2.3377	14	7	0.1769	994.5036	994.1692	.5009	.6673
Link114	397.6640	4.9708	48.0000	74.3073	13	19	2.4419	13	8	0.1869	994.5352	994.1692	.5088	.6673
Link115	397.6640	4.9708	48.0000	141.3943	13	29	4.4345	13	29	0.3556	994.1692	992.4483	.6673	.4871
Link116	397.6640	4.9708	48.0000	45.9510	13	47	2.3622	14	3	0.1156	995.0625	994.5036	.3906	.5009
N_Combine	397.6640	4.9708	48.0000	35.1615	13	28	2.5022	13	15	0.0884	995.8802	995.0625	.3450	.3906
NE_Combine	397.6640	4.9708	48.0000	24.5473	13	35	1.4750	13	7	0.0617	994.7203	994.5036	.3051	.5009
E_Combine	397.6640	4.9708	48.0000	16.6668	13	25	1.0491	15	17	0.0419	994.6383	994.5352	.2846	.5088
Link120	397.6640	4.9708	48.0000	98.2750	12	32	4.6127	12	20	0.2471	1009.440	1007.296	.6100	.3240

Link124	397.6640	4.9708	48.0000	140.1254	12	35	5.2181	12	26	0.3524	1008.820	1006.257	.7051	.3142
Link128	397.6640	4.9708	48.0000	65.7126	12	35	3.7475	12	34	0.1652	1008.016	1006.109	.5041	.2772
Link132	397.6640	4.9708	48.0000	100.9600	12	33	4.2989	12	33	0.2539	1008.418	1006.305	.6045	.3262
Link136	397.6640	4.9708	48.0000	74.1437	12	35	3.8869	12	29	0.1864	1008.112	1006.429	.5279	.3571
Link140	397.6640	4.9708	48.0000	39.4482	12	32	3.5717	1	48	0.0992	1007.539	1006.226	.3849	.3065
Link144	397.6640	4.9708	48.0000	77.2099	12	33	3.9564	12	33	0.1942	1007.165	1005.166	.5412	.2915
Link148	397.6640	4.9708	48.0000	34.9637	12	45	2.7777	12	44	0.0879	1006.412	1005.263	.3529	.3158
Link152	397.6640	4.9708	48.0000	128.8401	12	34	4.6841	12	33	0.3240	1008.685	1006.402	.6712	.3505
Link156	397.6640	4.9708	48.0000	94.7188	12	32	4.5816	1	49	0.2382	1009.392	1007.145	.5979	.2863
Link160	397.6640	4.9708	48.0000	22.1589	12	32	3.5566	1	48	0.0557	1010.138	1009.037	.2845	.2592
SE2_Link	397.6640	4.9708	48.0000	24.0775	13	24	2.0092	13	26	0.0605	996.6539	995.9681	.2885	.3670
SE1_Link	397.6640	4.9708	48.0000	18.5168	13	9	2.3753	7	34	0.0466	995.5166	995.2369	.2542	.4342
NW1_vweir	0.0000	0.0000	0.0000	12.9773	14	13	6.7156	14	13	0.0000	994.5000	994.5000	.0000	.0000
N1_vweir	0.0000	0.0000	0.0000	21.2132	13	55	9.0186	13	55	0.0000	994.5000	994.5000	.0000	.0000
N2_vweir	0.0000	0.0000	0.0000	20.5545	13	1	8.8496	13	1	0.0000	994.5000	994.5000	.0000	.0000
NE3_vweir	0.0000	0.0000	0.0000	17.5230	13	17	8.0416	13	17	0.0000	993.5000	993.5000	.0000	.0000
NE2_vweir	0.0000	0.0000	0.0000	8.6196	14	1	5.2537	14	1	0.0000	993.5000	993.5000	.0000	.0000
NE1_vweir	0.0000	0.0000	0.0000	4.8998	13	30	3.7435	13	30	0.0000	993.5000	993.5000	.0000	.0000
E1_vweir	0.0000	0.0000	0.0000	11.8093	13	21	6.3462	13	21	0.0000	993.5000	993.5000	.0000	.0000
SE1_vweir	0.0000	0.0000	0.0000	18.5184	13	9	8.3126	13	9	0.0000	994.5000	994.5000	.0000	.0000
SE2_vweir	0.0000	0.0000	0.0000	24.0778	13	24	9.7308	13	24	0.0000	995.5000	995.5000	.0000	.0000
SW2_vweir	0.0000	0.0000	0.0000	11.6325	13	45	6.2890	13	45	0.0000	995.5000	995.5000	.0000	.0000
SW1_vweir	0.0000	0.0000	0.0000	9.6796	12	47	5.6325	12	47	0.0000	995.5000	995.5000	.0000	.0000
NW1_Iweir	Undefnd	Undefnd	Undefn	36.9292	12	47								
NW1_Oweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
N1_Iweir	Undefnd	Undefnd	Undefn	85.5862	12	47								
N1_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
N2_Iweir	Undefnd	Undefnd	Undefn	61.7325	12	38								
N2_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NE3_Iweir	Undefnd	Undefnd	Undefn	93.8819	12	37								
NE3_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NE2_Iweir	Undefnd	Undefnd	Undefn	46.5297	12	47								
NE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NE1_Iweir	Undefnd	Undefnd	Undefn	32.1544	12	37								
NE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
E1_Iweir	Undefnd	Undefnd	Undefn	70.6723	12	37								
E1_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SE1_Iweir	Undefnd	Undefnd	Undefn	34.6615	12	47								
SE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SE2_Iweir	Undefnd	Undefnd	Undefn	111.3695	12	38								
SE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SW2_Iweir	Undefnd	Undefnd	Undefn	67.3951	12	38								
SW2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SW1_Iweir	Undefnd	Undefnd	Undefn	20.4586	12	34								
SW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NW1_inf	Undefnd	Undefnd	Undefn	1.5300	6	35								
N1_inf	Undefnd	Undefnd	Undefn	1.9500	5	36								
N2_inf	Undefnd	Undefnd	Undefn	1.3000	7	36								
NE3_inf	Undefnd	Undefnd	Undefn	1.8300	6	50								
NE2_inf	Undefnd	Undefnd	Undefn	2.4100	9	4								
NE1_inf	Undefnd	Undefnd	Undefn	1.1600	8	49								
E1_inf	Undefnd	Undefnd	Undefn	1.7600	8	39								
SE1_inf	Undefnd	Undefnd	Undefn	0.0600	2	52								
SE2_inf	Undefnd	Undefnd	Undefn	0.9800	4	5								
SW2_inf	Undefnd	Undefnd	Undefn	1.2800	5	44								
SW1_inf	Undefnd	Undefnd	Undefn	0.5700	8	41								
FREE # 1	Undefnd	Undefnd	Undefn	141.3945	13	29								

Table E11. Area assumptions used in the analysis Subcritical and Critical flow assumptions from Subroutine Head. See Figure 17-1 in the manual for further information.

Conduit Name	Duration of Dry Flow(min)	Duration of Sub-Critical Flow(min)	Durat. of Upstream Critical Flow(min)	Durat. of Downstream Critical Flow(min)	Maximum Hydraulic Radius-m	Maximum X-Sect Area(ft^2)	Maximum Vel*D (ft^2/s)
SW_Combine	734.4444	2145.5556	0.0000	0.0000	0.7495	10.5999	1.8486
Link97	721.6667	2158.3333	0.0000	0.0000	0.9613	16.5072	3.8985
Link99	454.0000	2426.0000	0.0000	0.0000	1.1047	21.5375	5.0725
Link106	745.7778	2134.2222	0.0000	0.0000	0.7369	10.5574	1.4853
Link112	734.8889	2145.1111	0.0000	0.0000	1.3220	30.8297	5.3554
Link114	454.0000	2426.0000	0.0000	0.0000	1.3308	31.1797	5.6285
Link115	454.0000	2426.0000	0.0000	0.0000	1.3436	31.8853	10.2380
Link116	724.3333	2155.6667	0.0000	0.0000	1.0484	19.6023	4.1797
N_Combine	724.1667	2155.8333	0.0000	0.0000	0.8935	14.3383	3.6037

NE_Combine	713.8333	2166.1667	0.0000	0.0000	0.9517	16.7929	2.3565
E_Combine	735.4444	2144.5556	0.0000	0.0000	0.9350	16.4738	1.6058
Link120	108.6667	2771.3333	0.0000	0.0000	1.0797	22.3888	7.6857
Link124	109.3333	2770.6667	0.0000	0.0000	1.1949	27.9608	9.8717
Link128	109.3333	2770.6667	0.0000	0.0000	0.9670	17.5421	5.8373
Link132	108.6667	2771.3333	0.0000	0.0000	1.1226	23.4911	7.9640
Link136	109.3333	2770.6667	0.0000	0.0000	1.0283	19.3681	6.4033
Link140	108.6667	2771.3333	0.0000	0.0000	0.8516	13.1916	4.0638
Link144	108.6667	2771.3333	0.0000	0.0000	1.0200	19.5198	6.5535
Link148	112.6667	2767.3333	0.0000	0.0000	0.8347	12.6049	3.7036
Link152	108.6667	2771.3333	0.0000	0.0000	1.2140	27.5634	9.4674
Link156	108.0000	2772.0000	0.0000	0.0000	1.0687	21.9480	7.5154
Link160	108.6667	2771.3333	0.0000	0.0000	0.7008	9.1064	2.6359
SE2_Link	700.5000	2179.5000	0.0000	0.0000	0.8095	11.9891	2.6329
SE1_Link	453.6667	2426.3333	0.0000	0.0000	0.8295	13.0183	1.9593
NW1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

==
| User defined weir submergence information |
| Average Weir Submergence Constant and Weir Head |
==

Weir Name	Mean Constant	Mean Weir Head
NW1_vweir	0.78840	0.65790
N1_vweir	0.78840	0.81939
N2_vweir	0.79900	0.57075
NE3_vweir	0.80497	0.71882
NE2_vweir	0.78661	0.57028
NE1_vweir	0.79079	0.43395
E1_vweir	0.79318	0.61368
SE1_vweir	0.90431	0.61293
SE2_vweir	0.81363	0.87542
SW2_vweir	0.79131	0.68184
SW1_vweir	0.79221	0.30497

==
| Table E12. Mean Conduit Flow Information |
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Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
SW_Combine	1.7503	302449.20	0.0058	0.7891	0.2022	0.2489	2.3503	0.0500
Link97	4.4090	761872.07	0.0155	0.7956	0.2715	0.3248	3.5175	0.0500
Link99	5.5469	958510.52	0.0200	0.8981	0.3408	0.3487	4.0903	0.0500
Link106	1.4450	249690.18	0.0050	0.7816	0.1693	0.2419	2.3494	0.0500
Link112	7.6381	1319865.0	0.0273	0.7894	0.2417	0.4399	6.3803	0.0500
Link114	7.1963	1243526.0	0.0283	0.8980	0.2711	0.4400	6.3180	0.0500
Link115	14.8335	2563228.3	0.0536	0.8980	0.4987	0.4664	6.8629	0.0500
Link116	4.9766	859953.16	0.0178	0.7942	0.2885	0.3323	3.9211	0.0500
N_Combine	3.5314	610233.57	0.0080	0.7942	0.2684	0.2925	3.0691	0.0500
NE_Combine	2.6612	459847.16	0.0053	0.7989	0.2549	0.2914	3.2235	0.0500
E_Combine	1.6484	284840.67	0.0040	0.7885	0.1760	0.2661	2.8564	0.0500
Link120	2.5654	443297.46	0.0290	0.9754	0.4188	0.2423	2.3957	0.0500
Link124	3.8920	672544.50	0.0415	0.9752	0.7345	0.2632	2.7623	0.0500
Link128	1.8166	313901.77	0.0193	0.9752	0.3899	0.1942	1.7541	0.0500
Link132	2.7190	469842.32	0.0301	0.9754	0.3910	0.2178	2.1426	0.0500
Link136	2.0572	355485.33	0.0218	0.9752	0.6749	0.1902	1.8427	0.0500
Link140	1.0232	176813.41	0.0114	0.9754	0.5030	0.1554	1.3045	0.0500
Link144	2.0810	359603.47	0.0227	0.9754	0.3366	0.1972	1.8376	0.0500
Link148	1.1952	206526.13	0.0098	0.9745	0.1864	0.2224	1.9090	0.0500
Link152	3.5109	606681.98	0.0381	0.9754	0.3700	0.2642	2.6750	0.0500
Link156	2.4460	422675.27	0.0274	0.9756	0.6650	0.2296	2.1637	0.0500
Link160	0.5761	99546.187	0.0071	0.9754	0.2539	0.1391	1.0785	0.0500
SE2_Link	2.6588	459441.48	0.0055	0.8048	0.2712	0.2736	2.6682	0.0500
SE1_Link	1.1377	196593.77	0.0046	0.8982	0.1665	0.2459	2.4321	0.0500
NW1_vweir	1.4451	249716.39	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	2.3863	412347.30	0.0066	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	1.1448	197817.56	0.0058	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	1.6960	293070.53	0.0053	0.0000	0.0000	0.0000	0.0000	0.0000

NE2_vweir	0.9648	166710.67	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	0.4882	84355.881	0.0014	0.0000	0.0000	0.0000	0.0000	0.0000
E1_vweir	1.1599	200436.43	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	1.1374	196541.30	0.0053	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	2.6587	459422.84	0.0068	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	1.4363	248192.96	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	0.3137	54214.797	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000
NW1_Iweir	1.4896	257407.67						
NW1_Oweir	0.0000	0.0000						
N1_Iweir	2.4782	428226.36						
N1_ovrweir	0.0000	0.0000						
N2_Iweir	1.1596	200384.68						
N2_ovrweir	0.0000	0.0000						
NE3_Iweir	1.7831	308119.69						
NE3_ovweir	0.0000	0.0000						
NE2_Iweir	1.0410	179876.71						
NE2_ovweir	0.0000	0.0000						
NE1_Iweir	0.5203	89903.448						
NE1_ovweir	0.0000	0.0000						
E1_Iweir	1.2272	212060.59						
E1_ovrweir	0.0000	0.0000						
SE1_Iweir	1.1487	198494.72						
SE1_ovweir	0.0000	0.0000						
SE2_Iweir	2.7685	478395.03						
SE2_ovweir	0.0000	0.0000						
SW2_Iweir	1.5115	261188.85						
SW2_ovweir	0.0000	0.0000						
SW1_Iweir	0.3154	54499.945						
SW1_ovweir	0.0000	0.0000						
NW1_inf	1.1452	197884.91						
N1_inf	1.4682	253705.35						
N2_inf	0.6635	114645.37						
NE3_inf	0.9428	162910.15						
NE2_inf	1.0613	183398.98						
NE1_inf	0.5177	89457.663						
E1_inf	0.8648	149443.40						
SE1_inf	0.0480	8296.5048						
SE2_inf	0.7576	130911.73						
SW2_inf	0.9551	165048.40						
SW1_inf	0.2677	46257.351						
FREE # 1	14.8361	2563679.7						

Table E18 - Junction Continuity Error. Division by Volume added 11/96

Continuity Error = Net Flow + Beginning Volume - Ending Volume / (Total Flow + (Beginning Volume + Ending Volume)/2)

Net Flow = Node Inflow - Node Outflow

Total Flow = absolute (Inflow + Outflow)

Intermediate column is a judgement on the node continuity error.

Excellent < 1 percent Great 1 to 2 percent Good 2 to 5 percent
Fair 5 to 10 percent Poor 10 to 25 percent Bad 25 to 50 percent
Terrible > 50 percent

Junction Name	<------Continuity Error -------> Volume	% of Node	% of Inflow	Remaining Volume	Beginning Volume	Net Flow Thru Node	Total Flow Thru Node	Failed to Converge
McGaw_NE1	-144.1935	-0.0408	0.0035	0.0024	0.0000	-144.1912	353507.5623	0
McGaw_E1	-127.7466	-0.0178	0.0031	0.0022	0.0000	-127.7443	719083.1160	0
McGaw_SE1	-25.5929	-0.0062	0.0006	0.0014	0.0000	-25.5915	413035.0518	0
McGaw_SE2	-165.3922	-0.0136	0.0040	0.0014	0.0000	-165.3909	1213199.568	0
McGaw_SW1	-88.0122	-0.0442	0.0021	0.0022	0.0000	-88.0100	199011.1016	0
McGaw_NE3	-135.1485	-0.0144	0.0033	0.0022	0.0000	-135.1464	939557.2559	0
McGaw_NE2	-203.7476	-0.0287	0.0049	0.0026	0.0000	-203.7450	710769.6743	0
McGaw_NW1	-258.4117	-0.0292	0.0063	0.0014	0.0000	-258.4103	886328.2500	0
McGaw_N1	-228.8614	-0.0170	0.0055	0.0014	0.0000	-228.8600	1344797.910	0
McGaw_N2	-91.9769	-0.0147	0.0022	0.0022	0.0000	-91.9747	627716.1540	0
McGaw_SW2	-210.1075	-0.0249	0.0051	0.0014	0.0000	-210.1062	845153.8626	0
Node37	-100.4795	-0.0166	0.0024	24.4715	0.0000	-76.0080	604856.9554	0
Node38	-296.7147	-0.0195	0.0072	82.1816	0.0000	-214.5331	1523762.746	0
Node39	-348.9720	-0.0182	0.0085	87.2610	0.0000	-261.7109	1916976.360	0
Node41	-646.6624	-0.0260	0.0157	129.2154	0.0000	-517.4470	2486877.229	0
Node42	-23.2343	-0.0047	0.0006	21.6800	0.0000	-1.5543	499406.5743	0
Node43	-331.2599	-0.0193	0.0080	85.1203	0.0000	-246.1396	1719876.905	0
Node45	-577.5456	-0.0219	0.0140	135.6218	0.0000	-441.9238	2639665.277	0
Node47	-696.2154	-0.0136	0.0169	189.8314	0.0000	-506.3840	5126619.260	0

Out	-738.5877	-0.0144	0.0179	60.1363	0.0000	-678.4514	5126907.929	0
Node49	-174.9599	-0.0143	0.0042	28.0153	0.0000	-146.9446	1220398.427	0
Node50	-161.6013	-0.0176	0.0039	34.4384	0.0000	-127.1629	919628.3604	0
Node51	-131.5319	-0.0231	0.0032	29.0795	0.0000	-102.4524	569632.9809	0
NW1_infil	-12147.7761	-1.3519	0.2945	0.0012	0.0000	-12147.7748	898590.0452	0
NW1_det	-9066.0100	-1.7587	0.2198	16747.1917	0.0000	7681.1817	507124.0662	0
NW1_pump	197884.9119	100.0000	4.7969	0.0000	0.0000	197884.9119	197884.9119	0
N1_infil	-9656.1111	-0.7129	0.2341	0.0012	0.0000	-9656.1098	1354476.214	0
N1_det	-18140.7575	-2.1154	0.4398	33980.5237	0.0000	15839.7661	840573.6548	0
N1_pump	253705.3510	100.0000	6.1501	0.0000	0.0000	253705.3510	253705.3510	0
N2_infil	-1174.6728	-0.1868	0.0285	0.0019	0.0000	-1174.6708	628931.8137	0
N2_det	-6342.6670	-1.5752	0.1538	8929.7510	0.0000	2587.0841	398202.2420	0
N2_pump	114647.3173	100.0017	2.7792	0.0000	0.0000	114647.3173	114645.3673	0
NE3_infil	-1242.3455	-0.1320	0.0301	0.0019	0.0000	-1242.3436	940872.1580	0
NE3_det	-12197.8498	-1.9839	0.2957	27273.5012	0.0000	15075.6515	601190.2185	0
NE3_pump	162912.8968	100.0017	3.9492	0.0000	0.0000	162912.8968	162910.1518	0
NE2_infil	-7949.0576	-1.1059	0.1927	0.0023	0.0000	-7949.0554	718761.0199	0
NE2_det	-8302.4947	-2.3236	0.2013	21458.9595	0.0000	13156.4648	346587.3765	0
NE2_pump	183402.2235	100.0018	4.4459	0.0000	0.0000	183402.2235	183398.9763	0
NE1_infil	-2641.9470	-0.7418	0.0640	0.0021	0.0000	-2641.9448	356174.5262	0
NE1_det	-4310.7328	-2.4061	0.1045	9794.1389	0.0000	5483.4062	174259.3290	0
NE1_pump	89459.4032	100.0019	2.1686	0.0000	0.0000	89459.4032	89457.6632	0
E1_infil	-1966.4751	-0.2727	0.0477	0.0020	0.0000	-1966.4731	721107.4600	0
E1_det	-8147.0621	-1.9288	0.1975	19769.5272	0.0000	11622.4651	412497.0134	0
E1_pump	149446.0433	100.0018	3.6227	0.0000	0.0000	149446.0433	149443.4033	0
SE1_infil	-339.7114	-0.0822	0.0082	0.0013	0.0000	-339.7101	413317.3495	0
SE1_det	-3194.4260	-0.8034	0.0774	5119.0388	0.0000	1924.6128	395036.0173	0
SE1_pump	8296.5048	100.0000	0.2011	0.0000	0.0000	8296.5048	8296.5048	0
SE2_infil	-2766.7059	-0.2275	0.0671	0.0012	0.0000	-2766.7047	1215988.742	0
SE2_det	-15880.6526	-1.6624	0.3850	34893.4564	0.0000	19012.8038	937817.8663	0
SE2_pump	130911.7344	100.0000	3.1734	0.0000	0.0000	130911.7344	130911.7344	0
SW2_infil	-3604.1353	-0.4246	0.0874	0.0012	0.0000	-3604.1340	848912.5307	0
SW2_det	-12324.0677	-2.3608	0.2987	25306.2050	0.0000	12982.1373	509381.8159	0
SW2_pump	165048.4040	100.0000	4.0009	0.0000	0.0000	165048.4040	165048.4040	0
SW1_infil	-1275.4626	-0.6368	0.0309	0.0020	0.0000	-1275.4606	200303.4823	0
SW1_det	-1166.9602	-1.0665	0.0283	1403.0647	0.0000	236.1045	108714.7412	0
SW1_pump	46258.2057	100.0018	1.1213	0.0000	0.0000	46258.2057	46257.3507	0
Node89	-101.5352	-0.0110	0.0025	26.9700	0.0000	-74.5652	918864.3196	0
Node90	-111.1846	-0.0283	0.0027	18.5235	0.0000	-92.6611	393135.0743	0

The total continuity error was 1.35202E+06 cubic feet
The remaining total volume was 2.05628E+05 cubic feet
Your mean node continuity error was Excellent
Your worst node continuity error was Fair

Selected XP-SWMM Output, Post-development Conditions, 100-year event
Neighborhood-only model for detention storage calculations

```
#####################################
# Rainfall input summary from Runoff #
#####################################

 Total rainfall for gage #     1 is    6.0000 inches

        ################################################
        # Table R9. Summary Statistics for Subcatchments #
        ################################################

 Note: Total Runoff Depth includes pervious & impervious area
       Pervious and Impervious Runoff Depth is only the runoff from those two areas.
```

Subcatchment.....	McGaw_SW2#1	McGaw_SW2#2	McGaw_SW1#1	McGaw_SW1#2	McGaw_SE2#1	McGaw_SE2#2
Area (acres).....	41.12000	18.32000	9.22000	7.90000	51.90000	87.78000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.01604	0.00000	2.02003	0.00000	2.00267
Total Losses (in).....	0.00000	3.98396	0.00000	3.97997	0.00000	3.99733
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	36.71133	0.00000	15.95027	0.00000	165.12017
Total Impervious Area						
Total Runoff Depth (in)	5.79212	0.00000	5.80357	0.00000	5.75370	0.00000
Peak Runoff Rate (cfs).	189.15877	0.00000	42.53244	0.00000	234.73263	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.79212	2.01604	5.80357	2.02003	5.75370	2.00267
Peak Runoff Rate (cfs).	189.15877	36.71133	42.53244	15.95027	234.73263	165.12017
Unit Runoff (in/hr)....	4.60016	2.00389	4.61306	2.01902	4.52279	1.88107
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_SE1#1	McGaw_SE1#2	McGaw_NE1#1	McGaw_NE1#2	McGaw_E1#1	McGaw_E1#2
Area (acres).....	11.93000	46.24000	17.10000	9.24000	32.82000	34.68000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.54184	0.00000	2.00544	0.00000	2.00659
Total Losses (in).....	0.00000	3.45816	0.00000	3.99456	0.00000	3.99341
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	84.37480	0.00000	18.20412	0.00000	64.73512
Total Impervious Area						
Total Runoff Depth (in)	5.78870	0.00000	5.76166	0.00000	5.76495	0.00000
Peak Runoff Rate (cfs).	45.39038	0.00000	78.16195	0.00000	148.38912	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78870	2.54184	5.76166	2.00544	5.76495	2.00659
Peak Runoff Rate (cfs).	45.39038	84.37480	78.16195	18.20412	148.38912	64.73512
Unit Runoff (in/hr)....	3.80473	1.82471	4.57087	1.97014	4.52130	1.86664
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NW1#1	McGaw_NW1#2	McGaw_N1#1	McGaw_N1#2	McGaw_N2#1	McGaw_N2#2
Area (acres).....	44.95000	6.10000	65.18000	32.31000	27.94000	33.51000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.00659	0.00000	2.01244	0.00000	2.02630
Total Losses (in).....	0.00000	3.99341	0.00000	3.98756	0.00000	3.97370
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	11.38651	0.00000	55.54922	0.00000	60.98583
Total Impervious Area						
Total Runoff Depth (in)	5.76495	0.00000	5.78177	0.00000	5.82159	0.00000
Peak Runoff Rate (cfs).	203.23251	0.00000	283.49708	0.00000	125.49012	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.76495	2.00659	5.78177	2.01244	5.82159	2.02630
Peak Runoff Rate (cfs).	203.23251	11.38651	283.49708	55.54922	125.49012	60.98583
Unit Runoff (in/hr)....	4.52130	1.86664	4.34945	1.71926	4.49141	1.81993
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NE3#1	McGaw_NE3#2	McGaw_NE2#1	McGaw_NE2#2
Area (acres).....	42.33000	37.32000	35.11000	11.15000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000
Pervious Area				
Total Runoff Depth (in)	0.00000	2.07233	0.00000	2.01608
Total Losses (in).....	0.00000	3.92767	0.00000	3.98392
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	71.32692	0.00000	18.76731
Total Impervious Area				
Total Runoff Depth (in)	5.95384	0.00000	5.79223	0.00000
Peak Runoff Rate (cfs).	197.19646	0.00000	151.82729	0.00000
Impervious Area with depression storage				

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage				
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000
Total Area				
Total Runoff Depth (in)	5.95384	2.07233	5.79223	2.01608
Peak Runoff Rate (cfs).	197.19646	71.32692	151.82729	18.76731
Unit Runoff (in/hr)....	4.65855	1.91123	4.32433	1.68317
Rational Formula				
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000

===> Runoff simulation ended normally.

Table E10 - CONDUIT SUMMARY STATISTICS

Note: The peak flow may be less than the design flow and the conduit may still surcharge because of the downstream boundary conditions.

* denotes an open conduit that has been overtopped this is a potential source of severe errors

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Ends Upstream (ft)	Maximum Depth at Pipe Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS	
SW_Combine	397.6640	4.9708	48.0000	107.0676	12	50	2.4494	12	30	0.2692	1003.714	1003.647	2.053	2.286	*
Link97	397.6640	4.9708	48.0000	314.0868	12	50	3.9253	12	50	0.7898	1003.647	1003.116	2.286	2.403	*
Link99	397.6640	4.9708	48.0000	393.5837	12	55	4.9196	12	55	0.9897	1003.115	1002.179	2.403	2.419	*
Link106	397.6640	4.9708	48.0000	83.3754	13	15	1.5036	14	13	0.2097	1002.712	1002.674	2.053	2.293	*
Link112	397.6640	4.9708	48.0000	483.5878	13	5	6.0445	13	5	1.2161	1002.042	1000.581	2.385	2.270	*
Link114	397.6640	4.9708	48.0000	511.2815	12	56	6.3908	12	56	1.2857	1002.179	1000.581	2.419	2.270	*
Link115	397.6640	4.9708	48.0000	980.6136	13	2	12.2577	13	2	2.4659	1000.581	994.5000	2.270	1.000	*
Link116	397.6640	4.9708	48.0000	318.6746	13	6	3.9830	13	6	0.8014	1002.674	1002.042	2.293	2.385	*
N_Combine	397.6640	4.9708	48.0000	247.3628	12	52	3.3221	12	35	0.6220	1003.037	1002.674	2.134	2.293	*
NE_Combine	397.6640	4.9708	48.0000	180.7223	12	51	2.2580	12	51	0.4545	1002.214	1002.042	2.178	2.385	*
E_Combine	397.6640	4.9708	48.0000	139.5990	12	49	1.7451	12	49	0.3510	1002.270	1002.179	2.192	2.419	*
Link120	397.6640	4.9708	48.0000	214.5488	12	32	5.3496	12	21	0.5395	1010.215	1008.351	.8038	.5878	
Link124	397.6640	4.9708	48.0000	337.6847	12	35	6.6353	12	22	0.8492	1009.920	1007.105	.9800	.5262	
Link128	397.6640	4.9708	48.0000	185.2724	12	35	5.1428	12	34	0.4659	1009.075	1006.742	.7688	.4355	
Link132	397.6640	4.9708	48.0000	266.9487	12	33	5.7176	12	32	0.6713	1009.541	1007.077	.8854	.5193	
Link136	397.6640	4.9708	48.0000	170.2235	12	35	4.6773	12	26	0.4281	1008.856	1007.412	.7139	.6031	
Link140	397.6640	4.9708	48.0000	96.2090	12	32	3.8433	12	16	0.2419	1008.223	1006.931	.5559	.4826	
Link144	397.6640	4.9708	48.0000	211.8561	12	33	5.3565	12	32	0.5328	1008.241	1005.848	.8104	.4619	
Link148	397.6640	4.9708	48.0000	129.3579	12	44	3.9080	12	42	0.3253	1007.497	1006.330	.6243	.5825	
Link152	397.6640	4.9708	48.0000	397.4056	12	33	6.7134	12	33	0.9994	1010.255	1007.506	1.063	.6265	*
Link156	397.6640	4.9708	48.0000	225.4693	12	32	5.5851	12	18	0.5670	1010.340	1007.816	.8349	.4541	
Link160	397.6640	4.9708	48.0000	58.2656	12	31	3.2340	12	31	0.1465	1010.786	1009.554	.4464	.3886	
SE2_Link	397.6640	4.9708	48.0000	242.1348	12	46	3.1409	12	38	0.6089	1003.871	1003.647	2.092	2.286	*
SE1_Link	397.6640	4.9708	48.0000	104.0295	12	55	1.7163	4	30	0.2616	1003.173	1003.115	2.168	2.403	*
NW1_vweir	0.0000	0.0000	0.0000	79.3129	13	10	19.8968	13	10	0.0000	994.5000	994.5000	.0000	.0000	
N1_vweir	0.0000	0.0000	0.0000	123.6714	13	1	25.4612	13	1	0.0000	994.5000	994.5000	.0000	.0000	
N2_vweir	0.0000	0.0000	0.0000	119.9962	12	43	25.5084	12	43	0.0000	994.5000	994.5000	.0000	.0000	
NE3_vweir	0.0000	0.0000	0.0000	123.1328	12	47	25.9064	12	47	0.0000	993.5000	993.5000	.0000	.0000	
NE2_vweir	0.0000	0.0000	0.0000	62.4541	13	13	17.2398	13	13	0.0000	993.5000	993.5000	.0000	.0000	
NE1_vweir	0.0000	0.0000	0.0000	40.2572	12	51	13.2460	12	51	0.0000	993.5000	993.5000	.0000	.0000	
E1_vweir	0.0000	0.0000	0.0000	100.6890	12	48	22.9598	12	48	0.0000	993.5000	993.5000	.0000	.0000	
SE1_vweir	0.0000	0.0000	0.0000	96.8801	12	50	22.1967	12	47	0.0000	994.5000	994.5000	.0000	.0000	
SE2_vweir	0.0000	0.0000	0.0000	173.2145	12	46	8113.508	13	0	0.0000	995.5000	995.5000	.0000	.0000	
SW2_vweir	0.0000	0.0000	0.0000	84.9610	12	48	20.7118	12	47	0.0000	995.5000	995.5000	.0000	.0000	
SW1_vweir	0.0000	0.0000	0.0000	49.9997	12	38	15.0858	12	38	0.0000	995.5000	995.5000	.0000	.0000	
NW1_Iweir	Undefnd	Undefnd	Undefn	130.9776	12	42									
NW1_Oweir	Undefnd	Undefnd	Undefn	0.0000	0	0									

N1_Iweir	Undefnd	Undefnd	Undefn	264.2547	12	43
N1_ovrweir	Undefnd	Undefnd	Undefn	41.3519	13	2
N2_Iweir	Undefnd	Undefnd	Undefn	179.9303	12	37
N2_ovrweir	Undefnd	Undefnd	Undefn	30.7327	12	43
NE3_Iweir	Undefnd	Undefnd	Undefn	257.4684	12	36
NE3_ovweir	Undefnd	Undefnd	Undefn	33.9820	12	47
NE2_Iweir	Undefnd	Undefnd	Undefn	137.4983	12	43
NE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NE1_Iweir	Undefnd	Undefnd	Undefn	88.9720	12	35
NE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
E1_Iweir	Undefnd	Undefnd	Undefn	203.3538	12	36
E1_ovrweir	Undefnd	Undefnd	Undefn	12.4454	12	48
SE1_Iweir	Undefnd	Undefnd	Undefn	128.7498	12	45
SE1_ovweir	Undefnd	Undefnd	Undefn	15.8929	12	54
SE2_Iweir	Undefnd	Undefnd	Undefn	369.3579	12	37
SE2_ovweir	Undefnd	Undefnd	Undefn	82.7879	12	46
SW2_Iweir	Undefnd	Undefnd	Undefn	196.3380	12	36
SW2_ovweir	Undefnd	Undefnd	Undefn	4.1513	12	55
SW1_Iweir	Undefnd	Undefnd	Undefn	56.2862	12	34
SW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NW1_inf	Undefnd	Undefnd	Undefn	1.5300	1	44
N1_inf	Undefnd	Undefnd	Undefn	1.9500	1	46
N2_inf	Undefnd	Undefnd	Undefn	1.3000	1	46
NE3_inf	Undefnd	Undefnd	Undefn	1.8300	1	45
NE2_inf	Undefnd	Undefnd	Undefn	2.4100	4	49
NE1_inf	Undefnd	Undefnd	Undefn	1.1600	1	45
E1_inf	Undefnd	Undefnd	Undefn	1.7600	1	46
SE1_inf	Undefnd	Undefnd	Undefn	0.0600	1	45
SE2_inf	Undefnd	Undefnd	Undefn	0.9800	1	42
SW2_inf	Undefnd	Undefnd	Undefn	1.2800	1	43
SW1_inf	Undefnd	Undefnd	Undefn	0.5700	3	53
FREE # 1	Undefnd	Undefnd	Undefn	980.6157	13	2

| Table E12. Mean Conduit Flow Information |

Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
SW_Combine	5.9006	1019617.7	0.0260	0.8203	0.1993	0.4337	8.0492	0.0500
Link97	15.0570	2601855.7	0.0763	0.8639	0.2895	0.5283	10.1382	0.0500
Link99	18.9196	3269314.0	0.0758	0.9410	0.3202	0.5806	11.6608	0.0500
Link106	4.5493	786125.73	0.0222	0.8064	0.1649	0.4255	8.3403	0.0500
Link112	25.6674	4435329.2	0.0912	0.8536	0.2280	0.6916	15.1543	0.0500
Link114	25.1872	4352341.6	0.0947	0.9327	0.2631	0.6953	15.1116	0.0500
Link115	50.8558	8787877.6	0.1713	0.9327	0.5445	0.7035	15.4002	0.0500
Link116	16.3765	2829866.1	0.0791	0.8438	0.2602	0.5579	11.3985	0.0500
N_Combine	11.8270	2043707.4	0.0812	0.8514	0.2908	0.4879	9.3943	0.0500
NE_Combine	9.2950	1606181.8	0.0496	0.8641	0.2300	0.5222	10.6168	0.0500
E_Combine	6.2695	1083362.1	0.0349	0.8298	0.1571	0.4991	10.1579	0.0500
Link120	5.7042	985684.72	0.0536	0.9861	0.3865	0.3343	4.0302	0.0500
Link124	9.2864	1604697.7	0.0787	0.9860	0.4488	0.3680	4.8589	0.0500
Link128	4.8451	837226.22	0.0423	0.9859	0.3671	0.2780	3.1324	0.0500
Link132	6.9216	1196058.2	0.0634	0.9861	0.3787	0.3118	3.8554	0.0500
Link136	4.7466	820209.82	0.0384	0.9859	0.4378	0.2853	3.3961	0.0500
Link140	2.4607	425203.54	0.0263	0.9861	0.3353	0.2287	2.2591	0.0500
Link144	5.4387	939812.72	0.0497	0.9861	0.3872	0.2850	3.3064	0.0500
Link148	3.9210	677553.29	0.0255	0.9854	0.2032	0.3127	3.5134	0.0500
Link152	9.9701	1722829.7	0.0910	0.9861	0.3510	0.3782	5.0700	0.0500
Link156	5.7821	999151.27	0.0559	0.9861	0.3930	0.3125	3.5413	0.0500
Link160	1.4604	252350.82	0.0164	0.9861	0.3379	0.1984	1.7642	0.0500
SE2_Link	9.1596	1582783.8	0.0611	0.8741	0.2820	0.4655	8.5579	0.0500
SE1_Link	3.8578	666627.20	0.0270	0.9482	0.1835	0.4373	8.4852	0.0500
NW1_vweir	4.5493	786114.75	0.0140	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	7.2726	1256712.9	0.0207	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	3.9553	683481.99	0.0233	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	5.6294	972760.83	0.0222	0.0000	0.0000	0.0000	0.0000	0.0000
NE2_vweir	3.4405	594512.69	0.0099	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	1.8321	316588.20	0.0077	0.0000	0.0000	0.0000	0.0000	0.0000
E1_vweir	4.3848	757694.23	0.0190	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	3.7713	651687.88	0.0194	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	8.3456	1442118.0	0.0334	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	4.7311	817533.02	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	1.1506	198822.55	0.0089	0.0000	0.0000	0.0000	0.0000	0.0000
NW1_Iweir	4.5526	786694.72						
NW1_Oweir	0.0000	0.0000						
N1_Iweir	7.7437	1338110.4						
N1_ovrweir	0.4442	76761.677						

```
  N2_Iweir    4.1066 709626.15
N2_ovrweir    0.1624 28062.948
 NE3_Iweir    5.8786 1015823.8
NE3_ovweir    0.2365 40870.465
 NE2_Iweir    3.4612 598093.93
NE2_ovweir    0.0000    0.0000
 NE1_Iweir    1.8323 316613.43
NE1_ovweir    0.0000    0.0000
  E1_Iweir    4.4457 768213.99
E1_ovrweir    0.0646 11169.534
 SE1_Iweir    3.8732 669283.78
SE1_ovweir    0.0966 16690.773
 SE2_Iweir    9.2049 1590601.4
SE2_ovweir    0.8151 140857.13
 SW2_Iweir    4.7652 823425.36
SW2_ovweir    0.0239 4135.5029
 SW1_Iweir    1.1459 198003.40
SW1_ovweir    0.0000    0.0000
   NW1_inf    1.2587 217503.79
    N1_inf    1.5853 273932.84
    N2_inf    0.7442 128589.48
   NE3_inf    1.0515 181707.39
   NE2_inf    1.3489 233084.75
   NE1_inf    0.6476 111899.17
    E1_inf    1.0008 172935.79
   SE1_inf    0.0493 8526.2934
   SE2_inf    0.7954 137443.41
   SW2_inf    1.0274 177541.80
   SW1_inf    0.3208 55433.671
  FREE # 1   50.8612 8788810.8
```

Selected XP-SWMM Output, Predevelopment Conditions, 2-year event
Expanded model for resource impact analysis

```
 *=========================================================*
 |         RUNOFF TABLES IN THE OUTPUT FILE.               |
 |  These are the more important tables in the output file. |
 |  You can use your editor to find the table numbers,      |
 |  for example: search for Table R3 to check continuity.   |
 |  This output file can be imported into a Word Processor  |
 |  and printed on US letter or A4 paper using portrait     |
 |  mode, courier font, a size of 8 pt. and margins of 0.75 |
 |                                                          |
 | Table R1  - Physical Hydrology Data                      |
 | Table R2  - Infiltration data                            |
 | Table R3  - Raingage and Infiltration Database Names     |
 | Table R4  - Groundwater Data                             |
 | Table R5  - Continuity Check for Surface Water           |
 | Table R6  - Continuity Check for Channels/Pipes          |
 | Table R7  - Continuity Check for Subsurface Water        |
 | Table R8  - Infiltration/Inflow Continuity Check         |
 | Table R9  - Summary Statistics for Subcatchments         |
 | Table R10 - Sensitivity anlysis for Subcatchments        |
 *=========================================================*

####################################
# Rainfall input summary from Runoff #
####################################

 Total rainfall for gage #     1 is    2.9000 inches


  ##################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A   #
  #             Physical Hydrology Data            #
  ##################################################
```

Subcatchment Number	Name	Channel or inlet	Width (ft)	Area (ac)	Per-cent Imperv	Slope ft/ft	"n" Imprv	"n" Perv	Deprs-sion Storge Imprv	Deprs-sion Strge Perv	Prcnt Zero Deten-tion
1	D-S_N2.1#1	D-S_N2.1	1.0000	6.6450	100.00	0.100	0.020	0.020	0.000	0.000	0.00
2	D-S_N2.1#2	D-S_N2.1	1.0000	4.4280	0.00	0.100	0.020	0.020	0.000	0.000	0.00
3	McGaw_NE2#1	McGaw_NE2	1.0000	8.0130	100.00	0.100	0.020	0.020	0.000	0.000	0.00
4	McGaw_NE2#2	McGaw_NE2	1.0000	38.085	0.00	0.100	0.020	0.020	0.000	0.000	0.00
5	McGaw_NE3#1	McGaw_NE3	1.0000	9.1790	100.00	0.100	0.020	0.020	0.000	0.000	0.00
6	McGaw_NE3#2	McGaw_NE3	1.0000	70.619	0.00	0.100	0.020	0.020	0.000	0.000	0.00
7	D-S_N3#1	D-S_N3	1.0000	.87800	100.00	0.100	0.020	0.020	0.000	0.000	0.00
8	D-S_N3#2	D-S_N3	1.0000	93.323	0.00	0.100	0.020	0.020	0.000	0.000	0.00
9	D-S_N8#1	D-S_N8	1.0000	26.853	100.00	0.100	0.020	0.020	0.000	0.000	0.00
10	D-S_N8#2	D-S_N8	1.0000	84.947	0.00	0.100	0.020	0.020	0.000	0.000	0.00
11	D-S_N5#1	D-S_N5	1.0000	17.008	100.00	0.100	0.020	0.020	0.000	0.000	0.00
12	D-S_N5#2	D-S_N5	1.0000	33.566	0.00	0.100	0.020	0.020	0.000	0.000	0.00
13	D-S_N6#1	D-S_N6	1.0000	5.4890	100.00	0.100	0.020	0.020	0.000	0.000	0.00
14	D-S_N6#2	D-S_N6	1.0000	22.966	0.00	0.100	0.020	0.020	0.000	0.000	0.00
15	U-S_N1#1	U-S_N1	1.0000	11.077	100.00	0.100	0.020	0.020	0.000	0.000	0.00
16	U-S_N1#2	U-S_N1	1.0000	23.505	0.00	0.100	0.020	0.020	0.000	0.000	0.00
17	McGaw_NW1#1	McGaw_NW1	1.0000	.22000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
18	McGaw_NW1#2	McGaw_NW1	1.0000	51.073	0.00	0.100	0.020	0.020	0.000	0.000	0.00
19	U-S_N2#1	U-S_N2	1.0000	21.839	100.00	0.100	0.020	0.020	0.000	0.000	0.00
20	U-S_N2#2	U-S_N2	1.0000	13.756	0.00	0.100	0.020	0.020	0.000	0.000	0.00
21	McGaw_N1#2	McGaw_N1	1.0000	97.464	0.00	0.100	0.020	0.020	0.000	0.000	0.00
22	D-S_N6.1#1	D-S_N6.1	1.0000	16.539	100.00	0.100	0.020	0.020	0.000	0.000	0.00
23	D-S_N6.1#2	D-S_N6.1	1.0000	46.470	0.00	0.100	0.020	0.020	0.000	0.000	0.00
24	McGaw_N2#1	McGaw_N2	1.0000	2.4150	100.00	0.100	0.020	0.020	0.000	0.000	0.00
25	McGaw_N2#2	McGaw_N2	1.0000	59.013	0.00	0.100	0.020	0.020	0.000	0.000	0.00
26	D-S_N7#1	D-S_N7	1.0000	.54400	100.00	0.100	0.020	0.020	0.000	0.000	0.00
27	D-S_N7#2	D-S_N7	1.0000	14.638	0.00	0.100	0.020	0.020	0.000	0.000	0.00
28	D-S_N2#1	D-S_N2	1.0000	.55000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
29	D-S_N2#2	D-S_N2	1.0000	200.61	0.00	0.100	0.020	0.020	0.000	0.000	0.00
30	D-S_N1#1	D-S_N1	1.0000	1.0930	100.00	0.100	0.020	0.020	0.000	0.000	0.00
31	D-S_N1#2	D-S_N1	1.0000	184.35	0.00	0.100	0.020	0.020	0.000	0.000	0.00
32	McGaw_SE2#1	McGaw_SE2	1.0000	4.0810	100.00	0.100	0.020	0.020	0.000	0.000	0.00
33	McGaw_SE2#2	McGaw_SE2	1.0000	135.50	0.00	0.100	0.020	0.020	0.000	0.000	0.00
34	U-S_S1#1	U-S_S1	1.0000	.76000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
35	U-S_S1#2	U-S_S1	1.0000	35.852	0.00	0.100	0.020	0.020	0.000	0.000	0.00

36	D-S_S3#1	D-S_S3	1.0000	4.7330	100.00	0.100	0.020	0.020	0.000	0.000	0.00
37	D-S_S3#2	D-S_S3	1.0000	44.038	0.00	0.100	0.020	0.020	0.000	0.000	0.00
38	D-S_S9#1	D-S_S9	1.0000	.40000E-02	100.00	0.100	0.020	0.020	0.000	0.000	0.00
39	D-S_S9#2	D-S_S9	1.0000	28.234	0.00	0.100	0.020	0.020	0.000	0.000	0.00
40	McGaw_SW1#2	McGaw_SW1	1.0000	17.743	0.00	0.100	0.020	0.020	0.000	0.000	0.00
41	D-S_S6#2	D-S_S6	1.0000	84.152	0.00	0.100	0.020	0.020	0.000	0.000	0.00
42	D-S_S8#1	D-S_S8	1.0000	5.1180	100.00	0.100	0.020	0.020	0.000	0.000	0.00
43	D-S_S8#2	D-S_S8	1.0000	86.827	0.00	0.100	0.020	0.020	0.000	0.000	0.00
44	D-S_S7#1	D-S_S7	1.0000	.49000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
45	D-S_S7#2	D-S_S7	1.0000	110.86	0.00	0.100	0.020	0.020	0.000	0.000	0.00
46	McGaw_SW2#2	McGaw_SW2	1.0000	59.304	0.00	0.100	0.020	0.020	0.000	0.000	0.00
47	D-S_S5#1	D-S_S5	1.0000	7.7740	100.00	0.100	0.020	0.020	0.000	0.000	0.00
48	D-S_S5#2	D-S_S5	1.0000	118.68	0.00	0.100	0.020	0.020	0.000	0.000	0.00
49	D-S_S4#1	D-S_S4	1.0000	7.7820	100.00	0.100	0.020	0.020	0.000	0.000	0.00
50	D-S_S4#2	D-S_S4	1.0000	52.111	0.00	0.100	0.020	0.020	0.000	0.000	0.00
51	McGaw_SE1#1	McGaw_SE1	1.0000	8.5690	100.00	0.100	0.020	0.020	0.000	0.000	0.00
52	McGaw_SE1#2	McGaw_SE1	1.0000	49.694	0.00	0.100	0.020	0.020	0.000	0.000	0.00
53	D-S_S2#1	D-S_S2	1.0000	.12400	100.00	0.100	0.020	0.020	0.000	0.000	0.00
54	D-S_S2#2	D-S_S2	1.0000	103.74	0.00	0.100	0.020	0.020	0.000	0.000	0.00
55	D-S_S11#1	D-S_S11	1.0000	11.711	100.00	0.100	0.020	0.020	0.000	0.000	0.00
56	D-S_S11#2	D-S_S11	1.0000	51.900	0.00	0.100	0.020	0.020	0.000	0.000	0.00
57	D-S_S10#1	D-S_S10	1.0000	1.7440	100.00	0.100	0.020	0.020	0.000	0.000	0.00
58	D-S_S10#2	D-S_S10	1.0000	153.67	0.00	0.100	0.020	0.020	0.000	0.000	0.00
59	McGaw_E1#1	McGaw_E1	1.0000	3.3770	100.00	0.100	0.020	0.020	0.000	0.000	0.00
60	McGaw_E1#2	McGaw_E1	1.0000	68.401	0.00	0.100	0.020	0.020	0.000	0.000	0.00
61	D-S_S1#2	D-S_S1	1.0000	57.900	0.00	0.100	0.020	0.020	0.000	0.000	0.00
62	McGaw_NE1#2	McGaw_NE1	1.0000	26.420	0.00	0.100	0.020	0.020	0.000	0.000	0.00
63	D-S_M2#2	D-S_M2	1.0000	85.039	0.00	0.100	0.020	0.020	0.000	0.000	0.00
64	D-S_N1.1#1	D-S_N1.1	1.0000	2.4700	100.00	0.100	0.020	0.020	0.000	0.000	0.00
65	D-S_N1.1#2	D-S_N1.1	1.0000	13.362	0.00	0.100	0.020	0.020	0.000	0.000	0.00

```
##############################################################################################################
#          Table R2.  SUBCATCHMENT  DATA                                                                     #
#                     Infiltration or Time of Concentration Data                                             #
#                                                                                                            #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)              Infl #4(#8)  #
# SCS                 ->   Comp CN          Time Conc         Shape Factor        Depth or Fraction  #
# SBUH                ->   Comp CN          Time Conc                N/A                      N/A  #
# Green Ampt          ->   Suction          Hydr Cond           Initial MD                    N/A  #
# Horton              ->  Max Rate           Min Rate   Decay Rate (1/sec)      Max. Infilt. Volume  #
# Proportional        ->  Constant               N/A                N/A                      N/A  #
# Initial/Cont Loss   ->   Initial         Continuing                N/A                      N/A  #
# Initial/Proportional ->   Initial          Constant                N/A                      N/A  #
# Laurenson Parameters ->   B Value       Pervious "n"      Impervious Cont                 Exponent  #
# Rational Formula    -> Tc Method   Flow Path Length      Flow Path Slope  Roughness or Retardance  #
#                              (#1 - #4 is Impervious Data / #5 - #8 is Pervious Data)                       #
#                      Rational Formula Tc Method: 1 = Constant                                              #
#                                                  2 = Friend's Equation                                     #
#                                                  3 = Kinematic Wave                                        #
#                                                  4 = Alameda Method                                        #
#                                                  5 = Izzard's Formula                                      #
#                                                  6 = Kerby's Equation                                      #
#                                                  7 = Kirpich's Equation                                    #
#                                                  8 = Bransby Williams Equation                             #
#                                                  9 = Federal Aviation Authority Equation                   #
##############################################################################################################
```

Subcatchment Number	Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	D-S_N2.1#1	98.0000	0.2000	484.0000	0.2000				
2	D-S_N2.1#2	64.0000	0.2000	484.0000	0.2000				
3	McGaw_NE2#1	98.0000	0.6667	484.0000	0.2000				
4	McGaw_NE2#2	67.2000	0.6667	484.0000	0.2000				
5	McGaw_NE3#1	98.0000	0.4833	484.0000	0.2000				
6	McGaw_NE3#2	64.9000	0.4833	484.0000	0.2000				
7	D-S_N3#1	98.0000	0.4333	484.0000	0.2000				
8	D-S_N3#2	68.3000	0.4333	484.0000	0.2000				
9	D-S_N8#1	98.0000	1.4333	484.0000	0.2000				
10	D-S_N8#2	59.3000	1.4333	484.0000	0.2000				
11	D-S_N5#1	98.0000	1.0500	484.0000	0.2000				
12	D-S_N5#2	59.5000	1.0500	484.0000	0.2000				
13	D-S_N6#1	98.0000	0.4833	484.0000	0.2000				
14	D-S_N6#2	65.6000	0.4833	484.0000	0.2000				
15	U-S_N1#1	98.0000	0.2667	484.0000	0.2000				
16	U-S_N1#2	60.4000	0.2667	484.0000	0.2000				
17	McGaw_NW1#1	98.0000	0.4667	484.0000	0.2000				
18	McGaw_NW1#2	71.0000	0.4667	484.0000	0.2000				
19	U-S_N2#1	98.0000	0.2333	484.0000	0.2000				

20	U-S_N2#2	60.9000	0.2333	484.0000	0.2000
21	McGaw_N1#2	71.0000	0.6333	484.0000	0.2000
22	D-S_N6.1#1	98.0000	0.4333	484.0000	0.2000
23	D-S_N6.1#2	60.8000	0.4333	484.0000	0.2000
24	McGaw_N2#1	98.0000	0.5500	484.0000	0.2000
25	McGaw_N2#2	69.1000	0.5500	484.0000	0.2000
26	D-S_N7#1	98.0000	0.3667	484.0000	0.2000
27	D-S_N7#2	60.1000	0.3667	484.0000	0.2000
28	D-S_N2#1	98.0000	0.5000	484.0000	0.2000
29	D-S_N2#2	64.8000	0.5000	484.0000	0.2000
30	D-S_N1#1	98.0000	0.9167	484.0000	0.2000
31	D-S_N1#2	69.8000	0.9167	484.0000	0.2000
32	McGaw_SE2#1	98.0000	0.4500	484.0000	0.2000
33	McGaw_SE2#2	66.9000	0.4500	484.0000	0.2000
34	U-S_S1#1	98.0000	0.3000	484.0000	0.2000
35	U-S_S1#2	68.8000	0.3000	484.0000	0.2000
36	D-S_S3#1	98.0000	0.4500	484.0000	0.2000
37	D-S_S3#2	60.7000	0.4500	484.0000	0.2000
38	D-S_S9#1	98.0000	0.4333	484.0000	0.2000
39	D-S_S9#2	71.0000	0.4333	484.0000	0.2000
40	McGaw_SW1#2	71.0000	0.3333	484.0000	0.2000
41	D-S_S6#2	69.9000	0.6000	484.0000	0.2000
42	D-S_S8#1	98.0000	1.0167	484.0000	0.2000
43	D-S_S8#2	65.3000	1.0167	484.0000	0.2000
44	D-S_S7#1	98.0000	0.8000	484.0000	0.2000
45	D-S_S7#2	70.2000	0.8000	484.0000	0.2000
46	McGaw_SW2#2	69.7000	0.3500	484.0000	0.2000
47	D-S_S5#1	98.0000	0.6833	484.0000	0.2000
48	D-S_S5#2	67.9000	0.6833	484.0000	0.2000
49	D-S_S4#1	98.0000	0.9500	484.0000	0.2000
50	D-S_S4#2	60.8000	0.9500	484.0000	0.2000
51	McGaw_SE1#1	98.0000	0.5167	484.0000	0.2000
52	McGaw_SE1#2	67.1000	0.5167	484.0000	0.2000
53	D-S_S2#1	98.0000	0.5000	484.0000	0.2000
54	D-S_S2#2	70.1000	0.5000	484.0000	0.2000
55	D-S_S11#1	98.0000	0.6000	484.0000	0.2000
56	D-S_S11#2	62.8000	0.6000	484.0000	0.2000
57	D-S_S10#1	98.0000	0.7333	484.0000	0.2000
58	D-S_S10#2	68.9000	0.7333	484.0000	0.2000
59	McGaw_E1#1	98.0000	0.4667	484.0000	0.2000
60	McGaw_E1#2	69.1000	0.4667	484.0000	0.2000
61	D-S_S1#2	69.5000	0.3667	484.0000	0.2000
62	McGaw_NE1#2	71.3000	0.3667	484.0000	0.2000
63	D-S_M2#2	68.3000	0.5500	484.0000	0.2000
64	D-S_N1.1#1	98.0000	0.5500	484.0000	0.2000
65	D-S_N1.1#2	64.6000	0.5500	484.0000	0.2000

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Subcatchment Number	Subcatchment Name	Gage No	Infiltration Type	Routing Type	Rainfall Database Name	Infiltration Database Name
1	D-S_N2.1#1	1	SCS Method	SCS curvilinear		
2	D-S_N2.1#2	1	SCS Method	SCS curvilinear		
3	McGaw_NE2#1	1	SCS Method	SCS curvilinear		
4	McGaw_NE2#2	1	SCS Method	SCS curvilinear		
5	McGaw_NE3#1	1	SCS Method	SCS curvilinear		
6	McGaw_NE3#2	1	SCS Method	SCS curvilinear		
7	D-S_N3#1	1	SCS Method	SCS curvilinear		
8	D-S_N3#2	1	SCS Method	SCS curvilinear		
9	D-S_N8#1	1	SCS Method	SCS curvilinear		
10	D-S_N8#2	1	SCS Method	SCS curvilinear		
11	D-S_N5#1	1	SCS Method	SCS curvilinear		
12	D-S_N5#2	1	SCS Method	SCS curvilinear		
13	D-S_N6#1	1	SCS Method	SCS curvilinear		
14	D-S_N6#2	1	SCS Method	SCS curvilinear		
15	U-S_N1#1	1	SCS Method	SCS curvilinear		
16	U-S_N1#2	1	SCS Method	SCS curvilinear		
17	McGaw_NW1#1	1	SCS Method	SCS curvilinear		
18	McGaw_NW1#2	1	SCS Method	SCS curvilinear		
19	U-S_N2#1	1	SCS Method	SCS curvilinear		
20	U-S_N2#2	1	SCS Method	SCS curvilinear		
21	McGaw_N1#2	1	SCS Method	SCS curvilinear		
22	D-S_N6.1#1	1	SCS Method	SCS curvilinear		
23	D-S_N6.1#2	1	SCS Method	SCS curvilinear		
24	McGaw_N2#1	1	SCS Method	SCS curvilinear		

25	McGaw_N2#2	1	SCS Method	SCS curvilinear
26	D-S_N7#1	1	SCS Method	SCS curvilinear
27	D-S_N7#2	1	SCS Method	SCS curvilinear
28	D-S_N2#1	1	SCS Method	SCS curvilinear
29	D-S_N2#2	1	SCS Method	SCS curvilinear
30	D-S_N1#1	1	SCS Method	SCS curvilinear
31	D-S_N1#2	1	SCS Method	SCS curvilinear
32	McGaw_SE2#1	1	SCS Method	SCS curvilinear
33	McGaw_SE2#2	1	SCS Method	SCS curvilinear
34	U-S_S1#1	1	SCS Method	SCS curvilinear
35	U-S_S1#2	1	SCS Method	SCS curvilinear
36	D-S_S3#1	1	SCS Method	SCS curvilinear
37	D-S_S3#2	1	SCS Method	SCS curvilinear
38	D-S_S9#1	1	SCS Method	SCS curvilinear
39	D-S_S9#2	1	SCS Method	SCS curvilinear
40	McGaw_SW1#2	1	SCS Method	SCS curvilinear
41	D-S_S6#2	1	SCS Method	SCS curvilinear
42	D-S_S8#1	1	SCS Method	SCS curvilinear
43	D-S_S8#2	1	SCS Method	SCS curvilinear
44	D-S_S7#1	1	SCS Method	SCS curvilinear
45	D-S_S7#2	1	SCS Method	SCS curvilinear
46	McGaw_SW2#2	1	SCS Method	SCS curvilinear
47	D-S_S5#1	1	SCS Method	SCS curvilinear
48	D-S_S5#2	1	SCS Method	SCS curvilinear
49	D-S_S4#1	1	SCS Method	SCS curvilinear
50	D-S_S4#2	1	SCS Method	SCS curvilinear
51	McGaw_SE1#1	1	SCS Method	SCS curvilinear
52	McGaw_SE1#2	1	SCS Method	SCS curvilinear
53	D-S_S2#1	1	SCS Method	SCS curvilinear
54	D-S_S2#2	1	SCS Method	SCS curvilinear
55	D-S_S11#1	1	SCS Method	SCS curvilinear
56	D-S_S11#2	1	SCS Method	SCS curvilinear
57	D-S_S10#1	1	SCS Method	SCS curvilinear
58	D-S_S10#2	1	SCS Method	SCS curvilinear
59	McGaw_E1#1	1	SCS Method	SCS curvilinear
60	McGaw_E1#2	1	SCS Method	SCS curvilinear
61	D-S_S1#2	1	SCS Method	SCS curvilinear
62	McGaw_NE1#2	1	SCS Method	SCS curvilinear
63	D-S_M2#2	1	SCS Method	SCS curvilinear
64	D-S_N1.1#1	1	SCS Method	SCS curvilinear
65	D-S_N1.1#2	1	SCS Method	SCS curvilinear

Total Number of Subcatchments...	65
Total Tributary Area (acres)....	2607.50
Impervious Area (acres).....	185.26
Pervious Area (acres).....	2422.24
Total Width (feet).....	65.00
Percent Imperviousness.....	7.10

```
        ##################################################
        # Table R9. Summary Statistics for Subcatchments #
        ##################################################
```

Note: Total Runoff Depth includes pervious & impervious area
Pervious and Impervious Runoff Depth is only the runoff from those two areas.

Subcatchment.....	D-S_N2.1#1	D-S_N2.1#2	McGaw_NE2#1	McGaw_NE2#2	McGaw_NE3#1	McGaw_NE3#2
Area (acres).....	6.64500	4.42800	8.01300	38.08500	9.17900	70.61900
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.42744	0.00000	0.54723	0.00000	0.45901
Total Losses (in).....	0.00000	2.47256	0.00000	2.35277	0.00000	2.44099
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	1.57067	0.00000	10.12870	0.00000	17.72045
Total Impervious Area						
Total Runoff Depth (in)	2.67921	0.00000	2.68509	0.00000	2.67736	0.00000
Peak Runoff Rate (cfs).	14.54167	0.00000	12.92345	0.00000	16.92503	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.67921	0.42744	2.68509	0.54723	2.67736	0.45901
Peak Runoff Rate (cfs).	14.54167	1.57067	12.92345	10.12870	16.92503	17.72045
Unit Runoff (in/hr)....	2.18836	0.35471	1.61281	0.26595	1.84389	0.25093
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N3#1	D-S_N3#2	D-S_N8#1	D-S_N8#2	D-S_N5#1	D-S_N5#2
Area (acres).....	0.87800	93.32300	26.85300	84.94700	17.00800	33.56600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.58985	0.00000	0.27941	0.00000	0.28532
Total Losses (in).....	0.00000	2.31015	0.00000	2.62059	0.00000	2.61468
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	36.09235	0.00000	5.15544	0.00000	2.48511
Total Impervious Area						

Total Runoff Depth (in)	2.67755	0.00000	2.68213	0.00000	2.68405	0.00000
Peak Runoff Rate (cfs).	1.68568	0.00000	26.75893	0.00000	20.93770	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.67755	0.58985	2.68213	0.27941	2.68405	0.28532
Peak Runoff Rate (cfs).	1.68568	36.09235	26.75893	5.15544	20.93770	2.48511
Unit Runoff (in/hr)....	1.91991	0.38675	0.99650	0.06069	1.23105	0.07404
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N6#1	D-S_N6#2	U-S_N1#1	U-S_N1#2	McGaw_NW1#1	McGaw_NW1#2
Area (acres).....	5.48900	22.96600	11.07700	23.50500	0.02200	51.07300
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.48458	0.00000	0.31101	0.00000	0.70490
Total Losses (in).....	0.00000	2.41542	0.00000	2.58899	0.00000	2.19510
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	6.25495	0.00000	4.44382	0.00000	24.24369
Total Impervious Area						

Total Runoff Depth (in)	2.67736	0.00000	2.67833	0.00000	2.67377	0.00000
Peak Runoff Rate (cfs).	10.12109	0.00000	23.69709	0.00000	0.04117	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67736	0.48458	2.67833	0.31101	2.67377	0.70490
Peak Runoff Rate (cfs).	10.12109	6.25495	23.69709	4.44382	0.04117	24.24369
Unit Runoff (in/hr)....	1.84389	0.27236	2.13931	0.18906	1.87138	0.47469
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	U-S_N2#1	U-S_N2#2	McGaw_N1#2	D-S_N6.1#1	D-S_N6.1#2	McGaw_N2#1
Area (acres).....	21.83900	13.75600	97.46400	16.53900	46.47000	2.41500
Percent Impervious.....	100.00000	0.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.32510	0.70701	0.00000	0.32296	0.00000
Total Losses (in).....	0.00000	2.57490	2.19299	0.00000	2.57704	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	3.00070	38.52647	0.00000	6.96958	0.00000
Total Impervious Area						
Total Runoff Depth (in)	2.67013	0.00000	0.00000	2.67755	0.00000	2.68399
Peak Runoff Rate (cfs).	47.18007	0.00000	0.00000	31.75334	0.00000	4.25820
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67013	0.32510	0.70701	2.67755	0.32296	2.68399
Peak Runoff Rate (cfs).	47.18007	3.00070	38.52647	31.75334	6.96958	4.25820
Unit Runoff (in/hr)....	2.16036	0.21814	0.39529	1.91991	0.14998	1.76323
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#2	D-S_N7#1	D-S_N7#2	D-S_N2#1	D-S_N2#2	D-S_N1#1
Area (acres).....	59.01300	0.54400	14.63800	0.05500	200.61100	1.09300
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.62458	0.00000	0.30175	0.00000	0.45656	0.00000
Total Losses (in).....	2.27542	0.00000	2.59825	0.00000	2.44344	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	21.46638	0.00000	2.16174	0.00000	48.81502	0.00000
Total Impervious Area						
Total Runoff Depth (in)	0.00000	2.67502	0.00000	2.68411	0.00000	2.68482
Peak Runoff Rate (cfs).	0.00000	1.09328	0.00000	0.10082	0.00000	1.46876
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	0.62458	2.67502	0.30175	2.68411	0.45656	2.68482
Peak Runoff Rate (cfs).	21.46638	1.09328	2.16174	0.10082	48.81502	1.46876
Unit Runoff (in/hr)....	0.36376	2.00971	0.14768	1.83302	0.24333	1.34379
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N1#2	McGaw_SE2#1	McGaw_SE2#2	U-S_S1#1	U-S_S1#2	D-S_S3#1
Area (acres).....	184.35100	4.08100	135.50300	0.07600	35.85200	4.73300
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.65472	0.00000	0.53483	0.00000	0.61195	0.00000
Total Losses (in).....	2.24528	0.00000	2.36517	0.00000	2.28805	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	51.61681	0.00000	44.46682	0.00000	17.48100	0.00000
Total Impervious Area						
Total Runoff Depth (in)	0.00000	2.68193	0.00000	2.68388	0.00000	2.68193
Peak Runoff Rate (cfs).	0.00000	7.75285	0.00000	0.15988	0.00000	8.99148
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	0.65472	2.68193	0.53483	2.68388	0.61195	2.68193
Peak Runoff Rate (cfs).	51.61681	7.75285	44.46682	0.15988	17.48100	8.99148
Unit Runoff (in/hr)....	0.27999	1.89974	0.32816	2.10368	0.48759	1.89974
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S3#2	D-S_S9#1	D-S_S9#2	McGaw_SW1#2	D-S_S6#2	D-S_S8#1
Area (acres).....	44.03800	0.00400	28.23400	17.74300	84.15200	5.11800
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.32046	0.00000	0.70590	0.70727	0.65852	0.00000
Total Losses (in).....	2.57954	0.00000	2.19410	2.19273	2.24148	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	6.37084	0.00000	13.91434	9.91313	31.26257	0.00000
Total Impervious Area						
Total Runoff Depth (in)	0.00000	2.67755	0.00000	0.00000	0.00000	2.68260
Peak Runoff Rate (cfs).	0.00000	0.00768	0.00000	0.00000	0.00000	6.41891
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.32046	2.67755	0.70590	0.70727	0.65852	2.68260
Peak Runoff Rate (cfs).	6.37084	0.00768	13.91434	9.91313	31.26257	6.41891
Unit Runoff (in/hr)....	0.14467	1.91991	0.49282	0.55871	0.37150	1.25418
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S8#2	D-S_S7#1	D-S_S7#2	McGaw_SW2#2	D-S_S5#1	D-S_S5#2
Area (acres).....	86.82700	0.04900	110.86000	59.30400	7.77400	118.67600
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.47446	0.00000	0.67197	0.64961	0.00000	0.57410
Total Losses (in).....	2.42554	0.00000	2.22803	2.25039	0.00000	2.32590
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	14.33436	0.00000	35.19095	29.04456	0.00000	33.31523
Total Impervious Area						

Total Runoff Depth (in)	0.00000	2.68403	0.00000	0.00000	2.67995	0.00000
Peak Runoff Rate (cfs).	0.00000	0.07160	0.00000	0.00000	12.38974	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.47446	2.68403	0.67197	0.64961	2.67995	0.57410
Peak Runoff Rate (cfs).	14.33436	0.07160	35.19095	29.04456	12.38974	33.31523
Unit Runoff (in/hr)....	0.16509	1.46130	0.31744	0.48976	1.59374	0.28072
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S4#1	D-S_S4#2	McGaw_SE1#1	McGaw_SE1#2	D-S_S2#1	D-S_S2#2
Area (acres).....	7.78200	52.11100	8.56900	49.69400	0.12400	103.73900
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.32363	0.00000	0.54249	0.00000	0.66761
Total Losses (in).....	0.00000	2.57637	0.00000	2.35751	0.00000	2.23239
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	4.98253	0.00000	15.36063	0.00000	43.69351
Total Impervious Area						

Total Runoff Depth (in)	2.68308	0.00000	2.68113	0.00000	2.68411	0.00000

Peak Runoff Rate (cfs).	10.21552	0.00000	15.53484	0.00000	0.22729	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.68308	0.32363	2.68113	0.54249	2.68411	0.66761
Peak Runoff Rate (cfs).	10.21552	4.98253	15.53484	15.36063	0.22729	43.69351
Unit Runoff (in/hr)....	1.31271	0.09561	1.81291	0.30910	1.83302	0.42119
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S11#1	D-S_S11#2	D-S_S10#1	D-S_S10#2	McGaw_E1#1	McGaw_E1#2
Area (acres).....	11.71100	51.90000	1.74400	153.66700	3.37700	68.40100
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.38717	0.00000	0.61517	0.00000	0.62220
Total Losses (in).....	0.00000	2.51283	0.00000	2.28483	0.00000	2.27780
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	8.64531	0.00000	45.58109	0.00000	27.39806
Total Impervious Area						

Total Runoff Depth (in)	2.68263	0.00000	2.67966	0.00000	2.67377	0.00000
Peak Runoff Rate (cfs).	19.87138	0.00000	2.66468	0.00000	6.31965	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.68263	0.38717	2.67966	0.61517	2.67377	0.62220
Peak Runoff Rate (cfs).	19.87138	8.64531	2.66468	45.58109	6.31965	27.39806
Unit Runoff (in/hr)....	1.69681	0.16658	1.52791	0.29662	1.87138	0.40055
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S1#2	McGaw_NE1#2	D-S_M2#2	D-S_N1.1#1	D-S_N1.1#2
Area (acres).....	57.90000	26.42000	85.03900	2.47000	13.36200
Percent Impervious.....	0.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area					

Total Runoff Depth (in)	0.63945	0.71880	0.59126	0.00000	0.44937
Total Losses (in).....	2.26055	2.18120	2.30874	0.00000	2.45063
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	27.21132	14.44442	28.64456	0.00000	2.98721
Total Impervious Area					

```
---------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000          2.68399          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000          4.35518          0.00000
Impervious Area with depression storage
---------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000          0.00000          0.00000
Impervious Area without depression storage
------------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000          0.00000          0.00000
Total Area
----------
Total Runoff Depth (in)          0.63945          0.71880          0.59126          2.68399          0.44937
Peak Runoff Rate (cfs).         27.21132         14.44442         28.64456          4.35518          2.98721
Unit Runoff (in/hr)....          0.46997          0.54672          0.33684          1.76323          0.22356
Rational Formula
----------------
Pervious Tc. (mins)....          0.00000          0.00000          0.00000          0.00000          0.00000
Perv. Intensity (in/hr)          0.00000          0.00000          0.00000          0.00000          0.00000
Pervious C ............          0.00000          0.00000          0.00000          0.00000          0.00000
Impervious Tc. (mins)..          0.00000          0.00000          0.00000          0.00000          0.00000
Imp. Intensity (in/hr).          0.00000          0.00000          0.00000          0.00000          0.00000
Impervious C ..........          0.00000          0.00000          0.00000          0.00000          0.00000
Partial Area (Ha)......          0.00000          0.00000          0.00000          0.00000          0.00000
Partial Area Tc........          0.00000          0.00000          0.00000          0.00000          0.00000
Partial Area Intensity.          0.00000          0.00000          0.00000          0.00000          0.00000

===> Runoff simulation ended normally.

#########################################################
#    Entry made to the HYDRAULIC Layer(Block) of SWMM #
#    Last Updated October,2000 by XP Software         #

    Existing Land Use Conditions in the Swan Creek Watershed
    Fitchburg McGaw Park Neighborhood Plan


*============================================================*
|        HYDRAULICS TABLES IN THE OUTPUT FILE                |
|  These are the more important tables in the output file.   |
|  You can use your editor to find the table numbers,        |
|  for example: search for Table E20 to check continuity.    |
|  This output file can be imported into a Word Processor    |
|  and printed on US letter or A4 paper using portrait       |
|  mode, courier font, a size of 8 pt. and margins of 0.75   |
|                                                            |
| Table E1   - Basic Conduit Data                            |
| Table E2   - Conduit Factor Data                           |
| Table E3a  - Junction Data                                 |
| Table E3b  - Junction Data                                 |
| Table E4   - Conduit Connectivity Data                     |
| Table E4a  - Dry Weather Flow Data                         |
| Table E4b  - Real Time Control Data                        |
| Table E5   - Junction Time Step Limitation Summary         |
| Table E5a  - Conduit Explicit Condition Summary            |
| Table E6   - Final Model Condition                         |
| Table E7   - Iteration Summary                             |
| Table E8   - Junction Time Step Limitation Summary         |
| Table E9   - Junction  Summary  Statistics                 |
| Table E10  - Conduit   Summary  Statistics                 |
| Table E11  - Area assumptions used in the analysis         |
| Table E12  - Mean conduit information                      |
| Table E13  - Channel losses(H) and culvert info            |
| Table E13a - Culvert Analysis Classification               |
| Table E14  - Natural Channel Overbank Flow Information     |
| Table E14a - Natural Channel Encroachment Information      |
| Table E14b - Floodplain Mapping                            |
| Table E15  - Spreadsheet Info List                         |
| Table E15a - Spreadsheet Reach List                        |
| Table E16  - New Conduit Output Section                    |
| Table E17  - Pump Operation                                |
| Table E18  - Junction Continuity Error                     |
| Table E19  - Junction Inflow Sources                       |
| Table E20  - Junction Flooding and Volume List             |
| Table E21  - Continuity balance at simulation end          |
| Table E22  - Model Judgement Section                       |
*============================================================*
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Table E1 - Conduit Data

Inp Num	Conduit Name	Length (ft)	Conduit Class	Area (ft^2)	Manning Coef.	Max Width (ft)	Depth (ft)	Trapezoid Side Slopes	
1	N_Link2	260.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
2	N_Link1	378.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
3	M_Link3	830.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
4	M_Link2	1350.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
5	M_Link1	865.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
6	M_Link0	100.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
7	Runoff_N1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
8	Runoff_M2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
9	S_Link5	1254.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
10	S_Link4	1268.0000	Natural	2001.3996	0.0500	359.0094	10.7000		
11	S_Link3	1224.0000	Natural	5595.6413	0.0500	969.0769	17.0000		
12	S_Link2	1138.0000	Natural	1200.8148	0.0500	498.2912	11.5000		
13	S_Link1	352.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
14	S_Link6	2140.0000	Natural	2001.3996	0.0500	359.0094	10.7000		
15	Roff_MGNE1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
16	Roff_MGE1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
17	Roff_MGSE1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
18	Runoff_S1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
19	Runoff_S2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
20	Roff_MGSE2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
21	Runoff_S3	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
22	S_Link10	911.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
23	S_Link9	775.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
24	S_Link8	420.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
25	S_Link7	750.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
26	Runoff_S4	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
27	S_Link12	1316.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
28	S_Link11	415.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
29	S_Link14	1419.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
30	S_Link13	1262.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
31	Runoff_S6	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
32	Runoff_S5	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
33	Runoff_S8	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
34	Runoff_S7	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
35	Roff_MGSW2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
36	Runoff_S9	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
37	Runoff_US1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
38	Roff_MGSW1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
39	S_Link15	2905.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
40	S_link16	680.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
41	Runoff_S10	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
42	Runoff_S11	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
43	Roff_MGNE3	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
44	Roff_MGNE2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
45	N_Link6	24.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
46	N_Link5	740.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
47	N_Link3	3300.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
48	N_Link7	527.8000	Trapezoid	240.0000	0.0300	40.0000	6.0000	0.0000	0.0000
49	N_Link9	936.3700	Trapezoid	450.0000	0.0500	75.0000	6.0000	0.0000	0.0000
50	N_Link8	1560.0000	Trapezoid	240.0000	0.0300	40.0000	6.0000	0.0000	0.0000
51	Runoff_N2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
52	Runoff_N3	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
53	Runoff_N8	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
54	Runoff_N5	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
55	NonameRd	95.0000	Rectangle	20.0000	0.0140	5.0000	4.0000		
56	N_Link11.1	50.0000	Rectangle	12.0000	0.0140	4.0000	3.0000		
57	N_Link11	408.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
58	LacyRd_N3b	71.0000	H Ellipse	29.5000	0.0140	7.5833	4.8333		
59	LacyRd_N3a	201.0000	Circular	15.9043	0.0140	4.5000	4.5000		
60	N_Link10	880.0000	Trapezoid	300.0000	0.0500	50.0000	6.0000	0.0000	0.0000
61	Runoff_N6	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
62	Roff_US_N1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
63	N_Link14	1383.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
64	N_Link13	882.0000	Natural	433.9710	0.0500	158.9321	6.0000		
65	Roff_MGNW1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
66	Roff_US_N2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
67	N_Link16	1422.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
68	Roff_MGN1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
69	Roff_MGN2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
70	Runoff_N7	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
71	N_Link12	640.0000	Natural	433.9710	0.0500	158.9321	6.0000		
72	N_Link12.1	460.0000	Natural	321.2769	0.0500	204.7484	3.0000		

73	Runoff_N2.	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
74	Runoff_N1.	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
75	N_Link4	480.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
76	RR_br	12.0000	Rectangle	200.0000	0.0300	20.0000	10.0000		
77	USH14_NCul	185.0000	Rectangle	84.0000	0.0140	14.0000	6.0000		
78	LacyN1_Cul	134.0000	Rectangle	72.0000	0.0140	12.0000	6.0000		
79	280.1	33.0000	Rectangle	36.0000	0.0500	6.0000	6.0000		
80	Lacy_MCulv	60.0000	Rectangle	99.0000	0.0240	18.0000	5.5000		
81	284.1	60.0000	Rectangle	136.5000	0.0240	21.0000	6.5000		
82	USH14_SCul	186.0000	Rectangle	48.0000	0.0140	8.0000	6.0000		
83	EHill_Culv	73.0000	Circular	19.6350	0.0240	5.0000	5.0000		
84	SyeneS1Cul	45.0000	Arch	17.7000	0.0240	6.0833	3.7500		
85	Irish1Culv	45.0000	Rectangle	15.0000	0.0240	5.0000	3.0000		
86	Irish2Culv	60.0000	Circular	4.9087	0.0240	2.5000	2.5000		
87	Irish3Culv	60.0000	Rectangle	16.0000	0.0240	8.0000	2.0000		
88	RR_S3Culv	60.0000	Rectangle	15.0000	0.0240	3.0000	5.0000		
89	Irish0Culv	60.0000	Rectangle	12.0000	0.0240	6.0000	2.0000		
90	SyeneN1_Cu	45.0000	Arch	7.0000	0.0240	3.3333	2.5833		
91	LacyN2_Cul	62.0000	Arch	7.0000	0.0240	3.3333	2.5833		
92	SyeneN2_Cu	120.0000	Circular	33.1831	0.0240	6.5000	6.5000		
93	SyeneN1_C	86.7000	Rectangle	32.0000	0.0140	8.0000	4.0000		
94	JonesFrm_C	86.0000	Rectangle	32.0000	0.0140	8.0000	4.0000		
95	573.1	10.0000	Circular	0.1963	0.0300	0.5000	0.5000		
96	592.1	10.0000	Circular	1.7671	0.0140	1.5000	1.5000		
97	SwnCrNout	300.0000	Closd Cnd	0.0000	0.0140	4.0000	4.0000		
98	SwnCkSout	300.0000	Closd Cnd	0.0000	0.0140	3.0000	3.0000		

Total length of all conduits .... 41664.8700 feet

Table E3a - Junction Data

Inp Num	Junction Name	Ground Elevation	Crown Elevation	Invert Elevation	Qinst cfs	Initial Depth-ft	Interface Flow (%)
1	N1	880.0000	878.0000	868.0000	0.0000	0.0000	100.0000
2	USH14_NDet	880.0000	878.5000	868.2000	0.0000	0.0000	100.0000
3	LacyRd_Det	880.0000	877.8000	867.8000	0.0000	0.0000	100.0000
4	N0	880.0000	876.5000	866.5000	0.0000	0.0000	100.0000
5	M7	880.0000	875.0000	865.0000	0.0000	0.0000	100.0000
6	S0	880.0000	878.0000	868.0000	0.0000	0.0000	100.0000
7	S1	880.0000	879.8000	868.3000	0.0000	0.0000	100.0000
8	S2	900.0000	892.7000	875.7000	0.0000	0.0000	100.0000
9	M6	880.0000	873.0000	863.0000	0.0000	0.0000	100.0000
10	M5	875.0000	872.5000	862.5000	0.0000	0.0000	100.0000
11	M4	880.0000	871.5000	861.5000	0.0000	0.0000	100.0000
12	M3	880.0000	871.0000	861.0000	0.0000	0.0000	100.0000
13	M1	870.0000	869.0000	859.0000	0.0000	0.0000	100.0000
14	M0	870.0000	868.0000	858.0000	0.0000	0.0000	100.0000
15	M_out	870.0000	867.0000	857.0000	0.0000	0.0000	100.0000
16	D-S_N1	880.0000	872.8000	868.8000	0.0000	0.0000	100.0000
17	D-S_M2	880.0000	868.0000	864.0000	0.0000	0.0000	100.0000
18	S3	900.0000	897.0000	880.0000	0.0000	0.0000	100.0000
19	S4	910.0000	898.7000	888.0000	0.0000	0.0000	100.0000
20	S6	920.0000	918.2000	907.5000	0.0000	0.0000	100.0000
21	S5	930.0000	916.8000	912.4000	0.0000	0.0000	100.0000
22	McGaw_NE1	880.0000	873.3000	869.3000	0.0000	0.0000	100.0000
23	McGaw_E1	890.0000	885.0000	881.0000	0.0000	0.0000	100.0000
24	McGaw_SE1	910.0000	893.0000	889.0000	0.0000	0.0000	100.0000
25	D-S_S1	885.0000	880.7000	876.7000	0.0000	0.0000	100.0000
26	D-S_S2	910.0000	893.0000	889.0000	0.0000	0.0000	100.0000
27	McGaw_SE2	930.0000	917.8000	913.8000	0.0000	0.0000	100.0000
28	D-S_S3	920.0000	913.0000	909.0000	0.0000	0.0000	100.0000
29	S7	930.0000	924.6000	914.6000	0.0000	0.0000	100.0000
30	S8	930.0000	925.0000	915.0000	0.0000	0.0000	100.0000
31	S9	930.0000	927.7000	917.7000	0.0000	0.0000	100.0000
32	S10	930.0000	928.2000	918.2000	0.0000	0.0000	100.0000
33	S11	940.0000	938.0000	928.0000	0.0000	0.0000	100.0000
34	S12	950.0000	947.6000	937.6000	0.0000	0.0000	100.0000
35	EHill_DetS	955.0000	945.0000	940.0000	0.0000	0.0000	100.0000
36	D-S_S4	940.0000	933.0000	929.0000	0.0000	0.0000	100.0000
37	S13	960.0000	956.0000	952.0000	0.0000	0.0000	100.0000
38	S14	990.0000	981.8000	977.8000	0.0000	0.0000	100.0000
39	S16	990.0000	976.0000	972.0000	0.0000	0.0000	100.0000
40	S17	990.0000	985.0000	981.0000	0.0000	0.0000	100.0000
41	S18	990.0000	984.3000	980.3000	0.0000	0.0000	100.0000
42	S15	990.0000	983.2000	979.2000	0.0000	0.0000	100.0000
43	D-S_S6	990.0000	986.0000	982.0000	0.0000	0.0000	100.0000
44	D-S_S5	960.0000	957.0000	953.0000	0.0000	0.0000	100.0000
45	D-S_S8	990.0000	985.3000	981.3000	0.0000	0.0000	100.0000

46	D-S_S7	990.0000	985.3000	981.3000	0.0000	0.0000	100.0000
47	McGaw_SW2	990.0000	985.3000	981.3000	0.0000	0.0000	100.0000
48	D-S_S9	990.0000	984.2000	980.2000	0.0000	0.0000	100.0000
49	U-S_S1	930.0000	917.8000	913.8000	0.0000	0.0000	100.0000
50	McGaw_SW1	990.0000	984.2000	980.2000	0.0000	0.0000	100.0000
51	RR_Det3	930.0000	920.0000	915.0000	0.0000	0.0000	100.0000
52	RR_Det4	930.0000	915.0000	910.0000	0.0000	0.0000	100.0000
53	S19	920.0000	912.0000	907.5000	0.0000	0.0000	100.0000
54	Irish_Det0	920.0000	914.0000	907.5000	0.0000	0.0000	100.0000
55	D-S_S10	920.0000	915.0000	911.0000	0.0000	0.0000	100.0000
56	D-S_S11	930.0000	920.0000	916.0000	0.0000	0.0000	100.0000
57	N2	900.0000	894.0000	884.0000	0.0000	0.0000	100.0000
58	N3	900.0000	898.0000	886.0000	0.0000	0.0000	100.0000
59	N5	910.0000	898.5000	894.5000	0.0000	0.0000	100.0000
60	N6	910.0000	899.3000	895.3000	0.0000	0.0000	100.0000
61	N7	910.0000	899.6000	895.6000	0.0000	0.0000	100.0000
62	N8	910.0000	900.3000	896.3000	0.0000	0.0000	100.0000
63	N4	910.0000	893.5000	887.0000	0.0000	0.0000	100.0000
64	SwanCk_N	910.0000	898.0000	892.0000	0.0000	0.0000	100.0000
65	SwanCk_S	920.0000	899.0000	893.0000	0.0000	0.0000	100.0000
66	McGaw_NE3	910.0000	901.3000	897.3000	0.0000	0.0000	100.0000
67	McGaw_NE2	910.0000	900.6000	896.6000	0.0000	0.0000	100.0000
68	N10	900.0000	899.9400	893.9400	0.0000	0.0000	100.0000
69	N9	900.0000	899.6000	893.6000	0.0000	0.0000	100.0000
70	N12	920.0000	912.2000	906.2000	0.0000	0.0000	100.0000
71	N11	920.0000	911.2000	905.2000	0.0000	0.0000	100.0000
72	N10.1	910.0000	905.0000	899.0000	0.0000	0.0000	100.0000
73	D-S_N2	880.0000	873.5000	869.5000	0.0000	0.0000	100.0000
74	D-S_N3	910.0000	904.0000	900.0000	0.0000	0.0000	100.0000
75	D-S_N8	900.0000	897.0000	893.0000	0.0000	0.0000	100.0000
76	D-S_N5	920.0000	911.2000	907.2000	0.0000	0.0000	100.0000
77	N13	926.2500	921.8000	915.8000	0.0000	0.0000	100.0000
78	N14	926.2500	921.2333	916.4000	0.0000	0.0000	100.0000
79	N15	940.0000	930.8000	920.8000	0.0000	0.0000	100.0000
80	CrossDetE	960.0000	945.0000	941.0000	0.0000	0.0000	100.0000
81	CrossDetW	960.0000	947.0000	943.0000	0.0000	0.0000	100.0000
82	N16	960.0000	950.3000	940.3000	0.0000	0.0000	100.0000
83	QuarryHDet	1015.0000	1008.0000	1000.5000	0.0000	0.0000	100.0000
84	TechDet	1010.0000	1000.0000	990.2000	0.0000	0.0000	100.0000
85	D-S_N6	950.0000	948.0000	944.0000	0.0000	0.0000	100.0000
86	U-S_N1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
87	N19	1010.0000	1004.5000	1000.5000	0.0000	0.0000	100.0000
88	N17	985.0000	982.0000	976.0000	0.0000	0.0000	100.0000
89	N18	1000.0000	996.0000	990.0000	0.0000	0.0000	100.0000
90	McGaw_NW1	1010.0000	1001.0000	997.0000	0.0000	0.0000	100.0000
91	U-S_N2	1035.0000	1027.0000	1023.0000	0.0000	0.0000	100.0000
92	NobelDrDet	1030.0000	1026.0000	1019.5000	0.0000	0.0000	100.0000
93	N20	1030.0000	1023.0000	1019.0000	0.0000	0.0000	100.0000
94	McGaw_N1	985.0000	981.0000	977.0000	0.0000	0.0000	100.0000
95	McGaw_N2	950.0000	945.3000	941.3000	0.0000	0.0000	100.0000
96	D-S_N7	940.0000	925.8000	921.8000	0.0000	0.0000	100.0000
97	D-S_N6.1	955.0000	953.9500	947.9500	0.0000	0.0000	100.0000
98	D-S_N2.1	895.0000	889.0000	885.0000	0.0000	0.0000	100.0000
99	D-S_N1.1	870.0000	864.0000	860.0000	0.0000	0.0000	100.0000
100	N3.1	900.0000	897.7000	887.7000	0.0000	0.0000	100.0000
101	SwanCk_C	900.0000	896.0000	886.0000	0.0000	4.0000	100.0000
102	Node36	930.0000	916.0000	912.0000	0.0000	0.0000	100.0000

Table E3b - Junction Data

Inp Num	Junction Name	X Coord.	Y Coord.	Type of Manhole	Type of Inlet	Maximum Capacity	Pavement Shape	Pavement Slope
1	N1	0.0000	0.0000	No Ponding	Normal		0	0.0000
2	USH14_NDet	0.0000	0.0000	No Ponding	Normal		0	0.0000
3	LacyRd_Det	0.0000	0.0000	No Ponding	Normal		0	0.0000
4	N0	0.0000	0.0000	No Ponding	Normal		0	0.0000
5	M7	0.0000	0.0000	No Ponding	Normal		0	0.0000
6	S0	0.0000	0.0000	No Ponding	Normal		0	0.0000
7	S1	0.0000	0.0000	No Ponding	Normal		0	0.0000
8	S2	0.0000	0.0000	No Ponding	Normal		0	0.0000
9	M6	0.0000	0.0000	No Ponding	Normal		0	0.0000
10	M5	0.0000	0.0000	No Ponding	Normal		0	0.0000
11	M4	0.0000	0.0000	No Ponding	Normal		0	0.0000
12	M3	0.0000	0.0000	No Ponding	Normal		0	0.0000
13	M1	0.0000	0.0000	No Ponding	Normal		0	0.0000
14	M0	0.0000	0.0000	No Ponding	Normal		0	0.0000

15	M_out	0.0000	0.0000	No Ponding	Normal	0	0.0000
16	D-S_N1	0.0000	0.0000	No Ponding	Normal	0	0.0000
17	D-S_M2	0.0000	0.0000	No Ponding	Normal	0	0.0000
18	S3	0.0000	0.0000	No Ponding	Normal	0	0.0000
19	S4	0.0000	0.0000	No Ponding	Normal	0	0.0000
20	S6	0.0000	0.0000	No Ponding	Normal	0	0.0000
21	S5	0.0000	0.0000	No Ponding	Normal	0	0.0000
22	McGaw_NE1	0.0000	0.0000	No Ponding	Normal	0	0.0000
23	McGaw_E1	0.0000	0.0000	No Ponding	Normal	0	0.0000
24	McGaw_SE1	0.0000	0.0000	No Ponding	Normal	0	0.0000
25	D-S_S1	0.0000	0.0000	No Ponding	Normal	0	0.0000
26	D-S_S2	0.0000	0.0000	No Ponding	Normal	0	0.0000
27	McGaw_SE2	0.0000	0.0000	No Ponding	Normal	0	0.0000
28	D-S_S3	0.0000	0.0000	No Ponding	Normal	0	0.0000
29	S7	0.0000	0.0000	No Ponding	Normal	0	0.0000
30	S8	0.0000	0.0000	No Ponding	Normal	0	0.0000
31	S9	0.0000	0.0000	No Ponding	Normal	0	0.0000
32	S10	0.0000	0.0000	No Ponding	Normal	0	0.0000
33	S11	0.0000	0.0000	No Ponding	Normal	0	0.0000
34	S12	0.0000	0.0000	No Ponding	Normal	0	0.0000
35	EHill_DetS	0.0000	0.0000	No Ponding	Normal	0	0.0000
36	D-S_S4	0.0000	0.0000	No Ponding	Normal	0	0.0000
37	S13	0.0000	0.0000	No Ponding	Normal	0	0.0000
38	S14	0.0000	0.0000	No Ponding	Normal	0	0.0000
39	S16	0.0000	0.0000	No Ponding	Normal	0	0.0000
40	S17	0.0000	0.0000	No Ponding	Normal	0	0.0000
41	S18	0.0000	0.0000	No Ponding	Normal	0	0.0000
42	S15	0.0000	0.0000	No Ponding	Normal	0	0.0000
43	D-S_S6	0.0000	0.0000	No Ponding	Normal	0	0.0000
44	D-S_S5	0.0000	0.0000	No Ponding	Normal	0	0.0000
45	D-S_S8	0.0000	0.0000	No Ponding	Normal	0	0.0000
46	D-S_S7	0.0000	0.0000	No Ponding	Normal	0	0.0000
47	McGaw_SW2	0.0000	0.0000	No Ponding	Normal	0	0.0000
48	D-S_S9	0.0000	0.0000	No Ponding	Normal	0	0.0000
49	U-S_S1	0.0000	0.0000	No Ponding	Normal	0	0.0000
50	McGaw_SW1	0.0000	0.0000	No Ponding	Normal	0	0.0000
51	RR_Det3	0.0000	0.0000	No Ponding	Normal	0	0.0000
52	RR_Det4	0.0000	0.0000	No Ponding	Normal	0	0.0000
53	S19	0.0000	0.0000	No Ponding	Normal	0	0.0000
54	Irish_Det0	0.0000	0.0000	No Ponding	Normal	0	0.0000
55	D-S_S10	0.0000	0.0000	No Ponding	Normal	0	0.0000
56	D-S_S11	0.0000	0.0000	No Ponding	Normal	0	0.0000
57	N2	0.0000	0.0000	No Ponding	Normal	0	0.0000
58	N3	0.0000	0.0000	No Ponding	Normal	0	0.0000
59	N5	0.0000	0.0000	No Ponding	Normal	0	0.0000
60	N6	0.0000	0.0000	No Ponding	Normal	0	0.0000
61	N7	0.0000	0.0000	No Ponding	Normal	0	0.0000
62	N8	0.0000	0.0000	No Ponding	Normal	0	0.0000
63	N4	0.0000	0.0000	No Ponding	Normal	0	0.0000
64	SwanCk_N	0.0000	0.0000	No Ponding	Normal	0	0.0000
65	SwanCk_S	0.0000	0.0000	No Ponding	Normal	0	0.0000
66	McGaw_NE3	0.0000	0.0000	No Ponding	Normal	0	0.0000
67	McGaw_NE2	0.0000	0.0000	No Ponding	Normal	0	0.0000
68	N10	0.0000	0.0000	No Ponding	Normal	0	0.0000
69	N9	0.0000	0.0000	No Ponding	Normal	0	0.0000
70	N12	0.0000	0.0000	No Ponding	Normal	0	0.0000
71	N11	0.0000	0.0000	No Ponding	Normal	0	0.0000
72	N10.1	0.0000	0.0000	No Ponding	Normal	0	0.0000
73	D-S_N2	0.0000	0.0000	No Ponding	Normal	0	0.0000
74	D-S_N3	0.0000	0.0000	No Ponding	Normal	0	0.0000
75	D-S_N8	0.0000	0.0000	No Ponding	Normal	0	0.0000
76	D-S_N5	0.0000	0.0000	No Ponding	Normal	0	0.0000
77	N13	0.0000	0.0000	No Ponding	Normal	0	0.0000
78	N14	0.0000	0.0000	No Ponding	Normal	0	0.0000
79	N15	0.0000	0.0000	No Ponding	Normal	0	0.0000
80	CrossDetE	0.0000	0.0000	No Ponding	Normal	0	0.0000
81	CrossDetW	0.0000	0.0000	No Ponding	Normal	0	0.0000
82	N16	0.0000	0.0000	No Ponding	Normal	0	0.0000
83	QuarryHDet	0.0000	0.0000	No Ponding	Normal	0	0.0000
84	TechDet	0.0000	0.0000	No Ponding	Normal	0	0.0000
85	D-S_N6	0.0000	0.0000	No Ponding	Normal	0	0.0000
86	U-S_N1	0.0000	0.0000	No Ponding	Normal	0	0.0000
87	N19	0.0000	0.0000	No Ponding	Normal	0	0.0000
88	N17	0.0000	0.0000	No Ponding	Normal	0	0.0000
89	N18	0.0000	0.0000	No Ponding	Normal	0	0.0000
90	McGaw_NW1	0.0000	0.0000	No Ponding	Normal	0	0.0000
91	U-S_N2	0.0000	0.0000	No Ponding	Normal	0	0.0000
92	NobelDrDet	0.0000	0.0000	No Ponding	Normal	0	0.0000
93	N20	0.0000	0.0000	No Ponding	Normal	0	0.0000
94	McGaw_N1	0.0000	0.0000	No Ponding	Normal	0	0.0000

95	McGaw_N2	0.0000	0.0000	No Ponding	Normal	0	0.0000
96	D-S_N7	0.0000	0.0000	No Ponding	Normal	0	0.0000
97	D-S_N6.1	0.0000	0.0000	No Ponding	Normal	0	0.0000
98	D-S_N2.1	0.0000	0.0000	No Ponding	Normal	0	0.0000
99	D-S_N1.1	0.0000	0.0000	No Ponding	Normal	0	0.0000
100	N3.1	0.0000	0.0000	No Ponding	Normal	0	0.0000
101	SwanCk_C	0.0000	0.0000	No Ponding	Normal	0	0.0000
102	Node36	0.0000	0.0000	No Ponding	Normal	0	0.0000

Table E4 - Conduit Connectivity

Input Number	Conduit Name	Upstream Node	Downstream Node	Upstream Elevation	Downstream Elevation	
1	N_Link2	N1	LacyRd_Det	868.0000	867.8000	No Design
2	N_Link1	N0	M7	866.5000	865.0000	No Design
3	M_Link3	M7	M6	865.0000	863.0000	No Design
4	M_Link2	M5	M4	862.5000	861.5000	No Design
5	M_Link1	M3	M1	861.0000	859.0000	No Design
6	M_Link0	M0	M_out	858.0000	857.0000	No Design
7	Runoff_N1	D-S_N1	LacyRd_Det	868.8000	867.8000	No Design
8	Runoff_M2	D-S_M2	M6	864.0000	863.0000	No Design
9	S_Link5	S5	S4	912.4000	888.0000	No Design
10	S_Link4	S4	S3	888.0000	880.0000	No Design
11	S_Link3	S3	S2	880.0000	875.7000	No Design
12	S_Link2	S2	S1	875.7000	868.3000	No Design
13	S_Link1	S0	M7	868.0000	865.0000	No Design
14	S_Link6	S6	S4	907.5000	888.0000	No Design
15	Roff_MGNE1	McGaw_NE1	S1	869.3000	868.3000	No Design
16	Roff_MGE1	McGaw_E1	S3	881.0000	880.0000	No Design
17	Roff_MGSE1	McGaw_SE1	S4	889.0000	888.0000	No Design
18	Runoff_S1	D-S_S1	S2	876.7000	875.7000	No Design
19	Runoff_S2	D-S_S2	S4	889.0000	888.0000	No Design
20	Roff_MGSE2	McGaw_SE2	S5	913.8000	912.8000	No Design
21	Runoff_S3	D-S_S3	S6	909.0000	908.0000	No Design
22	S_Link10	S12	S11	937.6000	928.0000	No Design
23	S_Link9	S11	S10	928.0000	918.2000	No Design
24	S_Link8	S9	S8	917.7000	915.0000	No Design
25	S_Link7	S7	S6	914.6000	908.0000	No Design
26	Runoff_S4	D-S_S4	S11	929.0000	928.0000	No Design
27	S_Link12	S14	S13	977.8000	952.0000	No Design
28	S_Link11	S13	EHill_DetS	952.0000	940.0000	No Design
29	S_Link14	S17	S16	981.0000	972.0000	No Design
30	S_Link13	S16	S13	972.0000	952.0000	No Design
31	Runoff_S6	D-S_S6	S17	982.0000	981.0000	No Design
32	Runoff_S5	D-S_S5	S13	953.0000	952.0000	No Design
33	Runoff_S8	D-S_S8	S18	981.3000	980.3000	No Design
34	Runoff_S7	D-S_S7	S18	981.3000	980.3000	No Design
35	Roff_MGSW2	McGaw_SW2	S18	981.3000	980.3000	No Design
36	Runoff_S9	D-S_S9	S15	980.2000	979.2000	No Design
37	Runoff_US1	U-S_S1	S5	913.8000	912.8000	No Design
38	Roff_MGSW1	McGaw_SW1	S15	980.2000	979.2000	No Design
39	S_Link15	S19	S4	908.0000	888.0000	No Design
40	S_link16	Node36	Irish_Det0	912.0000	907.5000	No Design
41	Runoff_S10	D-S_S10	Irish_Det0	911.0000	910.0000	No Design
42	Runoff_S11	D-S_S11	RR_Det3	916.0000	915.0000	No Design
43	Roff_MGNE3	McGaw_NE3	N8	897.3000	896.3000	No Design
44	Roff_MGNE2	McGaw_NE2	N7	896.6000	895.6000	No Design
45	N_Link6	N7	N6	895.6000	895.3000	No Design
46	N_Link5	N5	N3	894.5000	888.0000	No Design
47	N_Link3	N2	USH14_NDet	884.0000	868.5000	No Design
48	N_Link7	N9	SwanCk_N	893.6000	892.0000	No Design
49	N_Link9	N11	SwanCk_S	905.2000	893.0000	No Design
50	N_Link8	N10.1	N10	899.0000	893.9400	No Design
51	Runoff_N2	D-S_N2	USH14_NDet	869.5000	868.5000	No Design
52	Runoff_N3	D-S_N3	N10.1	900.0000	899.0000	No Design
53	Runoff_N8	D-S_N8	SwanCk_N	893.0000	892.0000	No Design
54	Runoff_N5	D-S_N5	N12	907.2000	906.2000	No Design
55	NonameRd	CrossDetW	CrossDetE	943.0000	941.0000	No Design
56	N_Link11.1	CrossDetE	N16	941.0000	940.3000	No Design
57	N_Link11	N16	N15	940.3000	920.8000	No Design
58	LacyRd_N3b	N15	N14	920.8000	916.4000	No Design
59	LacyRd_N3a	N14	N13	916.4000	915.8000	No Design
60	N_Link10	N13	N12	915.8000	906.2000	No Design
61	Runoff_N6	D-S_N6	CrossDetW	944.0000	943.0000	No Design
62	Roff_US_N1	U-S_N1	QuarryHDet	1005.0000	1004.0000	No Design
63	N_Link14	N19	N17	1000.5000	976.0000	No Design

64	N_Link13	N18	N17	990.0000	976.0000	No Design
65	Roff_MGNW1	McGaw_NW1	TechDet	997.0000	996.0000	No Design
66	Roff_US_N2	U-S_N2	NobelDrDet	1023.0000	1022.0000	No Design
67	N_Link16	N20	TechDet	1019.0000	996.0000	No Design
68	Roff_MGN1	McGaw_N1	N17	977.0000	976.0000	No Design
69	Roff_MGN2	McGaw_N2	N16	941.3000	940.3000	No Design
70	Runoff_N7	D-S_N7	N15	921.8000	920.8000	No Design
71	N_Link12	N17	D-S_N6.1	976.0000	947.9500	No Design
72	N_Link12.1	D-S_N6.1	CrossDetW	947.9500	943.0000	No Design
73	Runoff_N2.	D-S_N2.1	N2	885.0000	884.0000	No Design
74	Runoff_N1.	D-S_N1.1	M1	860.0000	859.0000	No Design
75	N_Link4	N3.1	N2	887.7000	884.0000	No Design
76	RR_br	N3	N3.1	888.0000	887.7000	No Design
77	USH14_NCul	USH14_NDet	N1	868.2000	868.0000	No Design
78	LacyN1_Cul	LacyRd_Det	N0	867.8000	866.5000	No Design
79	280.1	M6	M5	863.0000	862.5000	No Design
80	Lacy_MCulv	M4	M3	861.5000	861.0000	No Design
81	284.1	M1	M0	859.0000	858.0000	No Design
82	USH14_SCul	S1	S0	868.3000	868.0000	No Design
83	EHill_Culv	EHill_DetS	S12	940.0000	937.6000	No Design
84	SyeneS1Cul	S10	S9	918.2000	917.7000	No Design
85	Irish1Culv	S8	S7	915.0000	914.6000	No Design
86	Irish2Culv	S15	S14	979.2000	977.8000	No Design
87	Irish3Culv	S17	S18	981.0000	980.3000	No Design
88	RR_S3Culv	RR_Det3	RR_Det4	915.0000	910.0000	No Design
89	Irish0Culv	Irish_Det0	S19	907.5000	907.5000	No Design
90	SyeneN1_Cu	N8	N7	896.3000	895.6000	No Design
91	LacyN2_Cul	N6	N5	895.3000	894.5000	No Design
92	SyeneN2_Cu	N4	N3	887.0000	886.0000	No Design
93	SyeneN1_C	N10	N9	893.9400	893.6100	No Design
94	JonesFrm_C	N12	N11	906.2000	905.2000	No Design
95	573.1	TechDet	N18	990.2000	990.0000	No Design
96	592.1	NobelDrDet	N20	1019.5000	1019.0000	No Design
97	SwnCrNout	SwanCk_N	SwanCk_C	892.0000	892.0000	No Design
98	SwnCkSout	SwanCk_S	SwanCk_C	893.0000	893.0000	No Design

```
*================================================*
|          FREE OUTFALL DATA (DATA GROUP I1)     |
|         BOUNDARY CONDITION ON DATA GROUP J1    |
*================================================*

Outfall at Junction....M_out            has boundary condition number...         1
```

```
*================================================*
|        INTERNAL CONNECTIVITY INFORMATION       |
*================================================*
```

CONDUIT	JUNCTION	JUNCTION
1.25in	QuarryHDet	N19
3.25in	QuarryHDet	N19
USH14_NOvr	USH14_NDet	N1
LacyN1_Ovr	LacyRd_Det	N0
PrivateDr	M6	M5
Lacy_MOvr	M4	M3
MM_ovr	M1	M0
USH14_SOvr	S1	S0
EHill_Ovr.1	EHill_DetS	S12
SyeneS1_Ovr	S10	S9
irish1_Ovr.1	S8	S7
Irish2Ovr	S15	S14
Irish3Ovr	S18	S17
RR_S3_Ovr	RR_Det3	RR_Det4
irish0_Ovr.1	Irish_Det0	S19
SyeneN1_Ov	N8	N7
LacyN2_Ovr	N6	N5
SyeneN2_Ov	N4	N3
SyeneN1_Ov.1	N10	N9
JonesFrm_O	N12	N11
Lacy_N3_Ov.1	N15	N13
StandPipe	QuarryHDet	N19
QuarryOvr	QuarryHDet	N19
Weir	TechDet	N18
NobelWeir	NobelDrDet	N20
SwnCrWeirN	SwanCk_N	SwanCk_C
SwanCkSout.1	SwanCk_S	SwanCk_C
Weir10	SwanCk_C	N4

```
          weir11         SwanCk_C              N4
          weir14         SwanCk_C              N4
         weirtop         SwanCk_C              N4
        RR_S4out          RR_Det4           Node36
        FREE # 1            M_out         BOUNDARY

 *==================================================*
 |        Boundary Condition Information            |
 |                Data Groups J1-J4                 |
 *==================================================*


 BC NUMBER..         1 Control water surface elevation is..      0.00 feet.


 ###########################################
 # Header information from interface file: #
 ###########################################

 Title from first computational layer:
 Existing Land Use Conditions in the Swan Creek Watershed
 Montgomery Associates

 Title from immediately preceding computational layer
 Existing Land Use Conditions in the Swan Creek Watershed
 Montgomery Associates

 Name of preceding layer:.............        Runoff Layer
 Initial Julian date (IDATEZ).....................   1993001
 Initial time of day in seconds (TZERO)............       0.0
 No. Transfered input locations...................        36
 No. Transfered pollutants........................         0
 Size of total catchment area (acres).............   2607.50

 ################################################
 # Element numbers of interface inlet locations: #
 ################################################

 D-S_N2.1         McGaw_NE2        McGaw_NE3        D-S_N3           D-S_N8           D-S_N5           D-S_N6
 U-S_N1           McGaw_NW1        U-S_N2           McGaw_N1         D-S_N6.1         McGaw_N2         D-S_N7
 D-S_N2           D-S_N1           McGaw_SE2        U-S_S1           D-S_S3           D-S_S9           McGaw_SW1
 D-S_S6           D-S_S8           D-S_S7           McGaw_SW2        D-S_S5           D-S_S4           McGaw_SE1
 D-S_S2           D-S_S11          D-S_S10          McGaw_E1         D-S_S1           McGaw_NE1        D-S_M2
 D-S_N1.1

 Conversion factor to cfs for flow units on interface file.  Multiply by:     1.00000

######## Important Information ########
Start date/time of interface file was.. 1993001    0.0000 hours
Start date/time of the simulation was.. 1993001    0.0000 hours
Same date/time found in interface file and model


 *==================================================*
 |        Table E9 - JUNCTION SUMMARY STATISTICS        |
 | The Maximum area is only the area of the node, it    |
 | does not include the area of the surrounding conduits|
 *==================================================*
```

Junction Name	Ground Elevation feet	Uppermost PipeCrown Elevation feet	Maximum Junction Elevation feet	Time of Occurence Hr.	Min.	Feet of Surcharge at Max Elevation	Freeboard of node feet	Maximum Junction Area ft^2	Maximum Gutter Depth feet	Maximum Gutter Width feet	Maximum Gutter Velocity ft/s
N1	880.0000	878.0000	871.1492	14	19	0.0000	8.8508	12.5660	0.0000	0.0000	0.0000
USH14_NDet	880.0000	878.5000	871.1900	14	19	0.0000	8.8100	42653.553	0.0000	0.0000	0.0000
LacyRd_Det	880.0000	877.8000	870.3433	14	26	0.0000	9.6567	18515.459	0.0000	0.0000	0.0000
N0	880.0000	876.5000	870.3143	14	26	0.0000	9.6857	12.5660	0.0000	0.0000	0.0000
M7	880.0000	875.0000	870.0752	14	28	0.0000	9.9248	12.5660	0.0000	0.0000	0.0000
S0	880.0000	878.0000	870.6634	14	28	0.0000	9.3366	12.5660	0.0000	0.0000	0.0000
S1	880.0000	879.8000	871.0780	14	27	0.0000	8.9220	12.5660	0.0000	0.0000	0.0000
S2	900.0000	892.7000	881.1266	14	23	0.0000	18.8734	12.5660	0.0000	0.0000	0.0000
M6	880.0000	873.0000	868.7870	14	32	0.0000	11.2130	12.5660	0.0000	0.0000	0.0000
M5	875.0000	872.5000	868.5136	14	34	0.0000	6.4864	12.5660	0.0000	0.0000	0.0000
M4	880.0000	871.5000	866.4901	14	38	0.0000	13.5099	12.5660	0.0000	0.0000	0.0000
M3	880.0000	871.0000	866.2532	14	38	0.0000	13.7468	12.5660	0.0000	0.0000	0.0000
M1	870.0000	869.0000	861.3718	14	40	0.0000	8.6282	12.5660	0.0000	0.0000	0.0000
M0	870.0000	868.0000	861.4255	14	40	0.0000	8.5745	12.5660	0.0000	0.0000	0.0000
M_out	870.0000	867.0000	859.5317	14	40	0.0000	10.4683	12.5660	0.0000	0.0000	0.0000
D-S_N1	880.0000	872.8000	870.5463	12	59	0.0000	9.4537	12.5660	0.0000	0.0000	0.0000

D-S_M2	880.0000	868.0000	868.7872	14	32	0.7872	11.2128	12.5660	0.0000	0.0000	0.0000
S3	900.0000	897.0000	885.5160	14	13	0.0000	14.4840	12.5660	0.0000	0.0000	0.0000
S4	910.0000	898.7000	891.6835	13	40	0.0000	18.3165	12.5660	0.0000	0.0000	0.0000
S6	920.0000	918.2000	910.9248	13	28	0.0000	9.0752	12.5660	0.0000	0.0000	0.0000
S5	930.0000	916.8000	913.6447	12	45	0.0000	16.3553	12.5660	0.0000	0.0000	0.0000
McGaw_NE1	880.0000	873.3000	871.0782	14	27	0.0000	8.9218	12.5660	0.0000	0.0000	0.0000
McGaw_E1	890.0000	885.0000	885.5166	14	13	0.5166	4.4834	12.5660	0.0000	0.0000	0.0000
McGaw_SE1	910.0000	893.0000	891.6864	13	40	0.0000	18.3136	12.5660	0.0000	0.0000	0.0000
D-S_S1	885.0000	880.7000	881.1270	14	23	0.4270	3.8730	12.5660	0.0000	0.0000	0.0000
D-S_S2	910.0000	893.0000	891.6869	13	39	0.0000	18.3131	12.5660	0.0000	0.0000	0.0000
McGaw_SE2	930.0000	917.8000	915.5669	12	44	0.0000	14.4331	12.5660	0.0000	0.0000	0.0000
D-S_S3	920.0000	913.0000	910.9259	13	28	0.0000	9.0741	12.5660	0.0000	0.0000	0.0000
S7	930.0000	924.6000	917.1582	13	16	0.0000	12.8418	12.5660	0.0000	0.0000	0.0000
S8	930.0000	925.0000	918.3318	13	15	0.0000	11.6682	12.5660	0.0000	0.0000	0.0000
S9	930.0000	927.7000	920.3647	13	13	0.0000	9.6353	12.5660	0.0000	0.0000	0.0000
S10	930.0000	928.2000	921.2249	13	13	0.0000	8.7751	12.5660	0.0000	0.0000	0.0000
S11	940.0000	938.0000	930.3317	13	10	0.0000	9.6683	12.5660	0.0000	0.0000	0.0000
S12	950.0000	947.6000	939.9663	13	5	0.0000	10.0337	12.5660	0.0000	0.0000	0.0000
EHill_DetS	955.0000	945.0000	942.7919	13	6	0.0000	12.2081	12535.436	0.0000	0.0000	0.0000
D-S_S4	940.0000	933.0000	930.3685	13	10	0.0000	9.6315	12.5660	0.0000	0.0000	0.0000
S13	960.0000	956.0000	953.6659	13	2	0.0000	6.3341	12.5660	0.0000	0.0000	0.0000
S14	990.0000	981.8000	978.4884	12	51	0.0000	11.5116	12.5660	0.0000	0.0000	0.0000
S16	990.0000	976.0000	973.5249	13	5	0.0000	16.4751	12.5660	0.0000	0.0000	0.0000
S17	990.0000	985.0000	983.1325	12	58	0.0000	6.8675	12.5660	0.0000	0.0000	0.0000
S18	990.0000	984.3000	983.8217	13	4	0.0000	6.1783	12.5660	0.0000	0.0000	0.0000
S15	990.0000	983.2000	981.9133	12	48	0.0000	8.0867	12.5660	0.0000	0.0000	0.0000
D-S_S6	990.0000	986.0000	983.3640	12	53	0.0000	6.6360	12.5660	0.0000	0.0000	0.0000
D-S_S5	960.0000	957.0000	954.5370	12	54	0.0000	5.4630	12.5660	0.0000	0.0000	0.0000
D-S_S8	990.0000	985.3000	983.8301	13	4	0.0000	6.1699	12.5660	0.0000	0.0000	0.0000
D-S_S7	990.0000	985.3000	983.8437	13	4	0.0000	6.1563	12.5660	0.0000	0.0000	0.0000
McGaw_SW2	990.0000	985.3000	983.8254	13	4	0.0000	6.1746	12.5660	0.0000	0.0000	0.0000
D-S_S9	990.0000	984.2000	981.9252	12	47	0.0000	8.0748	12.5660	0.0000	0.0000	0.0000
U-S_S1	930.0000	917.8000	914.8895	12	37	0.0000	15.1105	12.5660	0.0000	0.0000	0.0000
McGaw_SW1	990.0000	984.2000	981.9161	12	47	0.0000	8.0839	12.5660	0.0000	0.0000	0.0000
RR_Det3	930.0000	920.0000	915.5121	13	15	0.0000	14.4879	105689.98	0.0000	0.0000	0.0000
RR_Det4	930.0000	915.0000	911.5437	48	0	0.0000	18.4563	213778.29	0.0000	0.0000	0.0000
S19	920.0000	912.0000	909.0688	13	30	0.0000	10.9312	12.5660	0.0000	0.0000	0.0000
Irish_Det0	920.0000	914.0000	909.1550	13	28	0.0000	10.8450	80715.508	0.0000	0.0000	0.0000
D-S_S10	920.0000	915.0000	912.7123	12	58	0.0000	7.2877	12.5660	0.0000	0.0000	0.0000
D-S_S11	930.0000	920.0000	917.4801	12	49	0.0000	12.5199	12.5660	0.0000	0.0000	0.0000
N2	900.0000	894.0000	886.5890	13	52	0.0000	13.4110	12.5660	0.0000	0.0000	0.0000
N3	900.0000	898.0000	890.0598	13	34	0.0000	9.9402	12.5660	0.0000	0.0000	0.0000
N5	910.0000	898.5000	895.9826	12	53	0.0000	14.0174	12.5660	0.0000	0.0000	0.0000
N6	910.0000	899.3000	897.6680	12	50	0.0000	12.3320	12.5660	0.0000	0.0000	0.0000
N7	910.0000	899.6000	897.6720	12	50	0.0000	12.3280	12.5660	0.0000	0.0000	0.0000
N8	910.0000	900.3000	898.9984	12	47	0.0000	11.0016	12.5660	0.0000	0.0000	0.0000
N4	910.0000	893.5000	890.2735	13	35	0.0000	19.7265	12.5660	0.0000	0.0000	0.0000
SwanCk_N	910.0000	898.0000	893.9642	15	41	0.0000	16.0358	119420.88	0.0000	0.0000	0.0000
SwanCk_S	920.0000	899.0000	895.2063	13	33	0.0000	24.7937	42999.993	0.0000	0.0000	0.0000
McGaw_NE3	910.0000	901.3000	899.0829	12	47	0.0000	10.9171	12.5660	0.0000	0.0000	0.0000
McGaw_NE2	910.0000	900.6000	897.8326	12	51	0.0000	12.1674	12.5660	0.0000	0.0000	0.0000
N10	900.0000	899.9400	894.6732	13	3	0.0000	5.3268	12.5660	0.0000	0.0000	0.0000
N9	900.0000	899.6000	894.0856	13	6	0.0000	5.9144	12.5660	0.0000	0.0000	0.0000
N12	920.0000	912.2000	907.9382	13	26	0.0000	12.0618	12.5660	0.0000	0.0000	0.0000
N11	920.0000	911.2000	905.7757	13	29	0.0000	14.2243	12.5660	0.0000	0.0000	0.0000
N10.1	910.0000	905.0000	899.5836	12	47	0.0000	10.4164	12.5660	0.0000	0.0000	0.0000
D-S_N2	880.0000	873.5000	871.2109	12	45	0.0000	8.7891	12.5660	0.0000	0.0000	0.0000
D-S_N3	910.0000	904.0000	901.6729	12	43	0.0000	8.3271	12.5660	0.0000	0.0000	0.0000
D-S_N8	900.0000	897.0000	894.3686	13	15	0.0000	5.6314	12.5660	0.0000	0.0000	0.0000
D-S_N5	920.0000	911.2000	908.3250	13	8	0.0000	11.6750	12.5660	0.0000	0.0000	0.0000
N13	926.2500	921.8000	916.4894	13	22	0.0000	9.7606	12.5660	0.0000	0.0000	0.0000
N14	926.2500	921.2333	918.6780	13	19	0.0000	7.5720	12.5660	0.0000	0.0000	0.0000
N15	940.0000	930.8000	921.5338	13	20	0.0000	18.4662	12.5660	0.0000	0.0000	0.0000
CrossDetE	960.0000	945.0000	942.0291	13	23	0.0000	17.9709	88978.789	0.0000	0.0000	0.0000
CrossDetW	960.0000	947.0000	943.5443	12	48	0.0000	16.4557	31131.648	0.0000	0.0000	0.0000
N16	960.0000	950.3000	941.6672	13	20	0.0000	18.3328	12.5660	0.0000	0.0000	0.0000
QuarryHDet	1015.0000	1008.0000	1002.9108	13	5	0.0000	12.0892	29821.749	0.0000	0.0000	0.0000
TechDet	1010.0000	1000.0000	996.9174	13	17	0.0000	13.0826	20298.960	0.0000	0.0000	0.0000
D-S_N6	950.0000	948.0000	945.1047	12	43	0.0000	4.8953	12.5660	0.0000	0.0000	0.0000
U-S_N1	1015.0000	1009.0000	1006.3467	12	36	0.0000	8.6533	12.5660	0.0000	0.0000	0.0000
N19	1010.0000	1004.5000	1000.9081	13	10	0.0000	9.0919	12.5660	0.0000	0.0000	0.0000
N17	985.0000	982.0000	977.7552	13	10	0.0000	7.2448	12.5660	0.0000	0.0000	0.0000
N18	1000.0000	996.0000	991.2729	13	20	0.0000	8.7271	12.5660	0.0000	0.0000	0.0000
McGaw_NW1	1010.0000	1001.0000	998.2764	12	44	0.0000	11.7236	12.5660	0.0000	0.0000	0.0000
U-S_N2	1035.0000	1027.0000	1024.7346	12	33	0.0000	10.2654	12.5660	0.0000	0.0000	0.0000
NobelDrDet	1030.0000	1026.0000	1021.4786	12	35	0.0000	8.5214	6534.0000	0.0000	0.0000	0.0000
N20	1030.0000	1023.0000	1020.1174	12	38	0.0000	9.8826	12.5660	0.0000	0.0000	0.0000
McGaw_N1	985.0000	981.0000	978.4403	12	50	0.0000	6.5597	12.5660	0.0000	0.0000	0.0000
McGaw_N2	950.0000	945.3000	942.5361	12	47	0.0000	7.4639	12.5660	0.0000	0.0000	0.0000
D-S_N7	940.0000	925.8000	922.2066	12	42	0.0000	17.7934	12.5660	0.0000	0.0000	0.0000

D-S_N6.1	955.0000	953.9500	949.1724	13	12	0.0000	5.8276	12.5660	0.0000	0.0000	0.0000	
D-S_N2.1	895.0000	889.0000	886.5893	13	52	0.0000	8.4107	12.5660	0.0000	0.0000	0.0000	
D-S_N1.1	870.0000	864.0000	861.3720	14	40	0.0000	8.6280	12.5660	0.0000	0.0000	0.0000	
N3.1	900.0000	897.7000	890.0768	13	35	0.0000	9.9232	12.5660	0.0000	0.0000	0.0000	
SwanCk_C	900.0000	896.0000	892.1398	13	38	0.0000	7.8602	5619.3244	0.0000	0.0000	0.0000	
Node36	930.0000	916.0000	912.0000	0	0	0.0000	18.0000	12.5660	0.0000	0.0000	0.0000	

Table E10 - CONDUIT SUMMARY STATISTICS

Note: The peak flow may be less than the design flow and the conduit may still surcharge because of the downstream boundary conditions.

* denotes an open conduit that has been overtopped this is a potential source of severe errors

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Upstream (ft)	Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS	
N_Link2	768.8495	2.5628	120.0000	115.1680	14	17	2.5588	14	9	0.1498	871.1492	870.3433	.3149	.2543	
N_Link1	1746.275	5.8209	120.0000	130.8884	14	18	2.1883	13	4	0.0750	870.3143	870.0752	.3814	.5075	
M_Link3	1360.783	4.5359	120.0000	295.4109	14	27	2.6309	14	24	0.2171	870.0752	868.7870	.5075	.5787	
M_Link2	754.4772	2.5149	120.0000	299.0211	14	33	2.5443	14	28	0.3963	868.5136	866.4901	.6014	.4990	
M_Link1	1332.969	4.4432	120.0000	298.2668	14	39	3.9779	14	38	0.2238	866.2532	861.3718	.5253	.2372	
M_Link0	2772.126	9.2404	120.0000	299.1333	14	40	6.1163	14	40	0.1079	861.4255	859.5317	.3425	.2532	
Runoff_N1	397.6640	4.9708	48.0000	53.1336	13	7	3.3502	12	56	0.1336	870.5463	870.3433	.4366	.6358	
Runoff_M2	397.6640	4.9708	48.0000	26.4318	12	49	1.5589	12	36	0.0665	868.7872	868.7870	1.196	1.446	*
S_Link5	924.5090	11.5564	48.0000	65.6228	12	45	2.4544	12	41	0.0710	913.6447	891.6835	.3112	.9209	
S_Link4	14789.99	7.3898	128.4000	203.2246	13	40	1.7636	12	26	0.0137	891.6835	885.5160	.3442	.5155	
S_Link3	31616.76	5.6502	204.0000	164.7135	14	12	2.1894	13	24	0.0052	885.5160	881.1266	.3245	.3192	
S_Link2	5144.586	4.2842	138.0000	164.6606	14	23	3.7710	14	21	0.0320	881.1266	871.0780	.4719	.2416	
S_Link1	2559.189	8.5306	120.0000	165.9608	14	27	2.4304	15	16	0.0648	870.6634	870.0752	.2663	.5075	
S_Link6	17774.31	8.8809	128.4000	150.9527	13	28	1.9278	13	22	0.0085	910.9248	891.6835	.3201	.3442	
Roff_MGNE1	397.6640	4.9708	48.0000	14.5216	12	40	2.0508	12	35	0.0365	871.0782	871.0780	.4445	.6945	
Roff_MGE1	397.6640	4.9708	48.0000	32.4190	12	44	0.9306	12	38	0.0815	885.5166	885.5160	1.129	1.379	*
Roff_MGSE1	397.6640	4.9708	48.0000	29.4778	12	46	2.5798	1	53	0.0741	891.6864	891.6835	.6716	.9209	
Runoff_S1	397.6640	4.9708	48.0000	26.1500	12	40	0.7268	12	28	0.0658	881.1270	881.1266	1.106	1.356	*
Runoff_S2	397.6640	4.9708	48.0000	43.2461	12	45	1.2653	12	41	0.1088	891.6869	891.6835	.6717	.9209	
Roff_MGSE2	397.6640	4.9708	48.0000	51.7373	12	44	3.3564	12	45	0.1301	915.5669	913.9847	.4417	.2962	
Runoff_S3	397.6640	4.9708	48.0000	14.5926	12	44	1.7749	12	37	0.0367	910.9259	910.9248	.4815	.7312	
S_Link10	2845.702	9.4857	120.0000	148.0891	13	7	4.3114	13	7	0.0520	939.9663	930.3317	.2366	.2332	
S_Link9	3117.276	10.3909	120.0000	161.0777	13	10	4.0094	13	4	0.0517	930.3317	921.2249	.2332	.3025	
S_Link8	2222.646	7.4088	120.0000	160.3649	13	14	3.3957	13	8	0.0722	920.3647	918.3318	.2665	.3332	
S_Link7	2600.485	8.6683	120.0000	159.7525	13	16	3.8946	13	12	0.0614	917.1582	910.9248	.2558	.2925	
Runoff_S4	397.6640	4.9708	48.0000	14.2880	13	8	1.7306	1	59	0.0359	930.3685	930.3317	.3421	.5829	
S_Link12	927.9977	11.6000	48.0000	19.7795	12	51	2.8918	12	32	0.0213	978.4884	953.6659	.1721	.4165	
S_Link11	1127.020	14.0877	48.0000	149.7799	13	2	5.6114	12	49	0.1329	953.6659	942.7919	.4165	.6980	
S_Link14	527.8312	6.5979	48.0000	92.2768	13	1	4.2882	13	1	0.1748	983.1325	973.5249	.5331	.3812	
S_Link13	834.3540	10.4294	48.0000	91.4466	13	5	5.6199	13	13	0.1096	973.5249	953.6659	.3812	.4165	
Runoff_S6	397.6640	4.9708	48.0000	31.1774	12	51	1.6882	12	46	0.0784	983.3640	983.1325	.3410	.5331	
Runoff_S5	397.6640	4.9708	48.0000	45.0370	12	54	2.8414	12	49	0.1133	954.5370	953.6659	.3843	.4165	
Runoff_S8	397.6640	4.9708	48.0000	20.9318	13	14	0.6101	2	1	0.0526	983.8301	983.8217	.6325	.8804	
Runoff_S7	397.6640	4.9708	48.0000	35.1638	13	1	0.7315	12	58	0.0884	983.8437	983.8217	.6359	.8804	
Roff_MGSW2	397.6640	4.9708	48.0000	27.8862	12	40	1.2704	12	28	0.0701	983.8254	983.8217	.6313	.8804	
Runoff_S9	397.6640	4.9708	48.0000	13.2706	12	45	0.7797	13	36	0.0334	981.9252	981.9133	.4313	.6783	
Runoff_US1	397.6640	4.9708	48.0000	17.7414	12	38	2.4816	1	57	0.0446	914.8895	913.6447	.2724	.2112	
Roff_MGSW1	397.6640	4.9708	48.0000	8.8612	12	39	0.7808	12	13	0.0223	981.9161	981.9133	.4290	.6783	
S_Link15	549.9294	6.8741	48.0000	28.3920	13	30	0.8063	13	22	0.0516	909.0688	891.6835	.2672	.9209	
S_link16	539.1589	6.7395	48.0000	0.0000	0	0	0.0000	0	0	0.0000	912.0000	909.1550	.0000	.0000	
Runoff_S10	397.6640	4.9708	48.0000	48.0412	12	59	3.2859	12	59	0.1208	912.7123	911.1420	.4281	.2855	
Runoff_S11	397.6640	4.9708	48.0000	27.4728	12	49	3.7422	1	52	0.0691	917.4801	915.5121	.3700	.1280	
Roff_MGNE3	397.6640	4.9708	48.0000	33.3160	12	45	1.7112	1	51	0.0838	899.0829	898.9984	.4457	.6746	
Roff_MGNE2	397.6640	4.9708	48.0000	22.7048	12	53	1.7649	13	11	0.0571	897.8326	897.6720	.3082	.5180	
N_Link6	741.0031	9.2625	48.0000	54.6842	12	50	2.3729	13	18	0.0738	897.6720	897.6680	.5180	.5920	
N_Link5	621.1634	7.7645	48.0000	54.0397	12	53	4.1831	12	53	0.0870	895.9826	890.0598	.3706	.5149	
N_Link3	1899.861	6.3329	120.0000	116.6213	13	59	3.0172	13	58	0.0614	886.5890	871.1900	.2589	.2690	
N_Link7	1814.427	7.5601	72.0000	32.2081	13	6	1.4594	13	0	0.0178	894.0856	893.9642	.0809	.3274	
N_Link9	4565.759	10.1461	72.0000	100.3521	13	29	1.2244	13	0	0.0220	905.7757	895.2063	.0960	.3677	
N_Link8	1876.839	7.8202	72.0000	41.4498	12	53	1.8625	12	53	0.0221	899.5836	894.6732	.0973	.1222	
Runoff_N2	397.6640	4.9708	48.0000	49.1482	12	47	3.2769	12	45	0.1236	871.2109	871.1900	.4277	.6725	
Runoff_N3	397.6640	4.9708	48.0000	37.7361	12	43	3.3177	12	43	0.0949	901.6729	899.5836	.4182	.1459	
Runoff_N8	397.6640	4.9708	48.0000	30.9521	13	27	3.6975	2	0	0.0778	894.3686	893.9642	.3422	.4910	
Runoff_N5	397.6640	4.9708	48.0000	22.8835	13	6	2.3654	12	59	0.0575	908.3250	907.9382	.2812	.4345	
NonameRd	330.4296	16.5215	48.0000	27.7519	12	56	9.0955	12	51	0.0840	943.5443	942.0291	.1361	.2573	
N_Link11.1	135.9893	11.3324	36.0000	34.9872	13	25	7.4504	13	30	0.2573	942.0291	941.6672	.3430	.4557	
N_Link11	6060.385	20.2013	120.0000	80.9724	13	20	6.0597	13	20	0.0134	941.6672	921.5338	.1367	.0734	
LacyRd_N3b	1010.039	34.2386	58.0000	41.0565	13	20	5.3861	13	22	0.0406	921.5338	918.6780	.1518	.4713	

LacyRd_N3a	99.7666	6.2729	54.0000	27.3790	13	20	5.3303	13	21	0.2744	918.6780	916.4894	.5062	.1532
N_Link10	2664.101	8.8803	72.0000	82.0045	13	22	1.6740	13	6	0.0308	916.4894	907.9382	.1149	.2897
Runoff_N6	397.6640	4.9708	48.0000	15.9793	12	44	3.7284	1	52	0.0402	945.1047	943.5443	.2762	.1361
Roff_US_N1	397.6640	4.9708	48.0000	27.3638	12	36	2.7986	12	36	0.0688	1006.347	1004.849	.3367	.2122
N_Link14	882.1389	11.0267	48.0000	6.9728	13	10	0.6995	13	11	0.0079	1000.908	977.7552	.1020	.4388
N_Link13	3166.249	7.2960	72.0000	19.0778	13	20	1.9134	13	58	0.0060	991.2729	977.7552	.2121	.2925
Roff_MGNW1	397.6640	4.9708	48.0000	24.2326	12	45	2.6999	12	45	0.0609	998.2764	996.9174	.3191	.2293
Roff_US_N2	397.6640	4.9708	48.0000	49.5228	12	33	3.3148	12	33	0.1245	1024.735	1023.159	.4336	.2898
N_Link16	842.9060	10.5363	48.0000	47.6974	12	38	5.0421	12	38	0.0566	1020.117	997.1168	.2793	.2792
Roff_MGN1	397.6640	4.9708	48.0000	38.5142	12	52	2.7891	12	47	0.0969	978.4403	977.7552	.3601	.4388
Roff_MGN2	397.6640	4.9708	48.0000	25.5808	12	48	2.5922	12	45	0.0643	942.5361	941.6672	.3090	.3418
Runoff_N7	397.6640	4.9708	48.0000	3.1221	12	42	1.6974	1	54	0.0079	922.2066	921.5338	.1017	.1835
N_Link12	5261.284	12.1236	72.0000	52.4036	13	11	4.6005	13	15	0.0100	977.7552	949.1724	.2925	.2037
N_Link12.1	1336.358	4.1595	36.0000	65.5585	13	10	3.5999	1	51	0.0491	949.1724	943.5443	.4075	.1814
Runoff_N2.	397.6640	4.9708	48.0000	16.0270	12	33	2.0772	12	19	0.0403	886.5893	886.5890	.3973	.6473
Runoff_N1.	397.6640	4.9708	48.0000	7.1746	12	47	1.9086	12	46	0.0180	861.3720	861.3718	.3430	.5930
N_Link4	2433.847	8.1128	120.0000	125.9368	13	39	3.6984	13	35	0.0517	890.0768	886.5890	.2377	.2589
RR_br	3495.292	17.4765	120.0000	148.1729	13	38	3.4450	13	38	0.0424	890.0598	890.0768	.2060	.2377
USH14_NCul	480.7420	5.7231	72.0000	57.6767	14	15	1.3487	14	12	0.1200	871.1900	871.1492	.4983	.5249
LacyN1_Cul	1194.894	16.5957	72.0000	65.7618	14	16	2.3819	12	46	0.0550	870.3433	870.3143	.4239	.6357
280.1	172.5733	4.7937	72.0000	195.3822	13	25	6.5518	13	22	1.1322	868.7870	868.5136	.9645	1.002
Lacy_MCulv	919.4830	9.2877	66.0000	298.3276	14	37	3.2449	14	36	0.3245	866.4901	866.2532	.9073	.9551
284.1	2000.067	14.6525	78.0000	299.1334	14	40	5.0052	14	40	0.1496	861.3718	861.4255	.3649	.5270
USH14_SCul	293.0837	6.1059	72.0000	83.0093	14	26	3.8084	14	22	0.2832	871.0780	870.6634	.4630	.4439
EHill_Culv	255.7928	13.0274	60.0000	147.1660	13	6	14.2769	13	7	0.5753	942.7919	939.9663	.5584	.4733
SyeneS1Cul	125.3272	7.0806	45.0000	160.3150	13	13	10.5292	13	13	1.2792	921.2249	920.3647	.8066	.7106
Irish1Culv	83.8758	5.5917	36.0000	80.0039	13	15	5.4303	13	15	0.9538	918.3318	917.1582	1.110	.8527
Irish2Culv	33.9380	6.9138	30.0000	19.9694	12	49	6.0664	12	49	0.5884	981.9133	978.4884	1.085	.2754
Irish3Culv	92.2134	5.7633	24.0000	-65.6812	13	7	-4.0123	13	8	-0.7123	983.8217	983.1325	1.410	1.416
RR_S3Culv	256.8162	17.1211	60.0000	16.0452	13	39	8.2611	13	24	0.0625	915.5121	911.5437	.1024	.3087
Irish0Culv	1.9395	0.0000	24.0000	14.6797	13	16	1.6050	13	4	7.5687	909.1550	909.0688	.8275	.7844
SyeneN1_Cu	45.5304	6.5043	31.0000	33.0890	12	47	5.0091	12	46	0.7267	898.9984	897.6720	1.044	.8021
LacyN2_Cul	41.4675	5.9239	31.0000	54.6801	12	51	9.3645	12	50	1.3186	897.6680	895.9826	.9166	.5739
SyeneN2_Cu	259.2403	7.8124	78.0000	52.3598	13	38	2.8079	13	41	0.2020	890.2735	890.0598	.5036	.6246
SyeneN1_C	253.8520	7.9329	48.0000	16.2282	13	4	3.2239	13	4	0.0639	894.6732	894.1122	.1833	.1256
JonesFrm_C	443.6945	13.8655	48.0000	50.3445	13	26	6.4126	13	6	0.1135	907.9382	905.7757	.4345	.1439
573.1	0.3439	1.7513	6.0000	1.9117	13	16	9.2911	13	16	5.5596	996.9174	991.2729	13.43	2.545
592.1	21.8107	12.3423	18.0000	34.5062	12	35	21.5705	12	32	1.5821	1021.479	1020.117	1.319	.7449
SwnCrNout	0.0000	0.0000	48.0000	10.1006	15	41	5.5503	15	41	0.0000	893.9642	892.1398	.4910	.0349
SwnCkSout	0.0000	0.0000	36.0000	7.0000	13	16	4.0000	13	16	0.0000	895.2063	892.1398	.7354	-.287
1.25in	0.0221	0.8025	1.2498	0.1069	12	40	11.8110	12	40	4.8446	1002.911	1000.908	23.15	4.014
3.25in	0.2405	0.8025	3.2497	0.5027	13	6	8.6000	13	6	2.0897	1002.911	1001.761	5.209	1.000
USH14_NOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
LacyN1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
PrivateDr	Undefnd	Undefnd	Undefn	167.3373	14	32								
Lacy_MOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
MM_ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
USH14_SOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
EHill_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
SyeneS1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
irish1_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
Irish2Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
Irish3Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
RR_S3_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
irish0_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
SyeneN1_Ov	Undefnd	Undefnd	Undefn	0.0000	0	0								
LacyN2_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
SyeneN2_Ov	Undefnd	Undefnd	Undefn	0.0000	0	0								
SyeneN1_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
JonesFrm_O	Undefnd	Undefnd	Undefn	0.0000	0	0								
Lacy_N3_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
StandPipe	Undefnd	Undefnd	Undefn	6.4482	13	5								
QuarryOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
Weir	Undefnd	Undefnd	Undefn	17.2572	13	17								
NobelWeir	Undefnd	Undefnd	Undefn	14.6336	12	35								
SwnCrWeirN	Undefnd	Undefnd	Undefn	0.0000	0	0								
SwanCkSout.1	Undefnd	Undefnd	Undefn	92.7707	13	33								
Weir10	Undefnd	Undefnd	Undefn	103.2935	13	38								
weir11	Undefnd	Undefnd	Undefn	0.1725	13	38								
weir14	Undefnd	Undefnd	Undefn	0.0000	0	0								
weirtop	Undefnd	Undefnd	Undefn	0.0000	0	0								
RR_S4out	Undefnd	Undefnd	Undefn	0.0000	0	0								
FREE # 1	Undefnd	Undefnd	Undefn	299.1333	14	40								

Table E11. Area assumptions used in the analysis| Subcritical and Critical flow assumptions from Subroutine Head. See Figure 17-1 in the manual for further information.

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Conduit Name	Duration of Dry Flow(min)	Duration of Sub-Critical Flow(min)	Durat. of Upstream Critical Flow(min)	Durat. of Downstream Critical Flow(min)	Maximum Hydraulic Radius-m	Maximum X-Sect Area(ft^2)	Maximum Vel*D (ft^2/s)
N_Link2	292.3111	2587.6889	0.0000	0.0000	1.9784	45.4354	7.2106
N_Link1	198.9583	2681.0417	0.0000	0.0000	2.7741	82.9952	7.0324
M_Link3	135.5000	2744.5000	0.0000	0.0000	3.2856	112.3990	14.2739
M_Link2	135.5000	2744.5000	0.0000	0.0000	3.3624	117.6806	13.9776
M_Link1	422.0000	2458.0000	0.0000	0.0000	2.5325	74.9811	15.1651
M_Link0	147.6667	2732.3333	0.0000	0.0000	2.0587	48.9079	18.2176
Runoff_N1	1337.6000	1542.4000	0.0000	0.0000	1.1745	25.1339	5.0414
Runoff_M2	1821.5949	1058.4051	0.0000	0.0000	2.1630	80.0000	2.1822
S_Link5	146.2222	2733.7778	0.0000	0.0000	1.2056	33.3338	5.0589
S_Link4	113.0000	2767.0000	0.0000	0.0000	1.2384	222.4628	4.7716
S_Link3	113.0000	2767.0000	0.0000	0.0000	1.4421	96.0196	10.5186
S_Link2	135.3333	2744.6667	0.0000	0.0000	1.6396	43.6698	15.4621
S_Link1	135.3333	2744.6667	0.0000	0.0000	2.4321	68.4711	9.3785
S_Link6	112.3333	2767.6667	0.0000	0.0000	0.7510	80.1502	6.7663
Roff_MGNE1	894.9239	1985.0761	0.0000	0.0000	1.2844	29.7595	1.8811
Roff_MGE1	1205.1316	1674.8684	0.0000	0.0000	2.1630	80.0000	2.2759
Roff_MGSE1	1255.7281	1624.2719	0.0000	0.0000	1.7364	52.8387	2.1162
Runoff_S1	1687.3581	1192.6419	0.0000	0.0000	2.1630	80.0000	1.7759
Runoff_S2	1282.2836	1597.7164	0.0000	0.0000	1.7365	52.8451	3.0869
Roff_MGSE2	115.6667	0.0000	0.0000	2764.3333	0.9175	15.4148	4.9534
Runoff_S3	112.3667	1125.3932	0.0000	1642.2402	1.3584	33.0597	1.7821
S_Link10	278.3500	2601.6500	0.0000	0.0000	1.6785	34.3488	10.0801
S_Link9	136.6667	2743.3333	0.0000	0.0000	1.8480	40.6112	10.6204
S_Link8	189.2857	2690.7143	0.0000	0.0000	2.0274	47.4093	10.1365
S_Link7	266.6444	1134.8544	0.0000	1478.5012	1.8829	41.6415	10.4372
Runoff_S4	227.8167	2652.1833	0.0000	0.0000	1.0685	21.1140	1.2591
S_Link12	731.3167	2148.6833	0.0000	0.0000	0.7055	10.3494	2.3403
S_Link11	115.6667	2764.3333	0.0000	0.0000	1.2535	28.7290	11.6944
S_Link14	399.8215	2480.1785	0.0000	0.0000	1.0960	21.5197	7.8159
S_Link13	369.9804	2510.0196	0.0000	0.0000	0.9609	16.4382	8.8747
Runoff_S6	901.0874	1978.9126	0.0000	0.0000	1.0202	19.0486	2.8716
Runoff_S5	276.9532	2603.0468	0.0000	0.0000	0.9568	16.2986	4.3902
Runoff_S8	129.3333	2750.6667	0.0000	0.0000	1.6578	48.3131	1.3791
Runoff_S7	186.9048	2693.0952	0.0000	0.0000	1.6615	48.4938	2.2030
Roff_MGSW2	724.2229	2155.7771	0.0000	0.0000	1.6565	48.2476	2.1801
Runoff_S9	534.7619	2345.2381	0.0000	0.0000	1.2547	28.4659	1.0583
Runoff_US1	117.6667	63.7750	0.0000	2698.5583	0.6193	7.3642	2.2196
Roff_MGSW1	723.1771	2156.8229	0.0000	0.0000	1.2523	28.3802	0.7946
S_Link15	753.9167	2126.0833	0.0000	0.0000	1.2810	35.8557	1.8904
S_link16	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Runoff_S10	118.3333	0.0000	0.0000	2761.6667	0.8920	14.6204	4.6895
Runoff_S11	1349.5167	1530.4833	0.0000	0.0000	0.6380	9.0716	2.8424
Roff_MGNE3	111.6667	2768.3333	0.0000	0.0000	1.2679	28.8773	2.6078
Roff_MGNE2	1324.1333	1555.8667	0.0000	0.0000	0.9706	17.5043	2.2080
N_Link6	862.7849	2017.2151	0.0000	0.0000	1.2743	28.3588	4.2810
N_Link5	139.0000	2104.7667	0.0000	636.2333	0.8470	14.6216	5.6343
N_Link3	117.0000	2069.4917	0.0000	693.5083	1.8033	38.6593	7.7171
N_Link7	634.3194	2245.6806	0.0000	0.0000	1.0021	43.3910	0.8204
N_Link9	148.0000	2732.0000	0.0000	0.0000	1.2492	98.1805	1.4213
N_Link8	1460.1167	1419.8833	0.0000	0.0000	0.5419	22.2873	1.0456
Runoff_N2	160.8070	2162.3913	0.0000	556.8017	1.2425	27.9519	4.7805
Runoff_N3	116.3333	2763.6667	0.0000	0.0000	0.7356	11.3785	3.6912
Runoff_N8	120.3333	2759.6667	0.0000	0.0000	0.8745	14.7941	3.3866
Runoff_N5	180.3000	2699.7000	0.0000	0.0000	0.8439	13.3109	2.6647
NonameRd	140.2222	2739.7778	0.0000	0.0000	0.4981	3.2258	5.6862
N_Link11.1	206.9630	2673.0370	0.0000	0.0000	0.7389	4.7225	8.8704
N_Link11	132.6667	2747.3333	0.0000	0.0000	0.8794	13.3624	6.3657
LacyRd_N3b	156.5833	2723.4167	0.0000	0.0000	0.8864	7.6264	8.1077
LacyRd_N3a	157.5833	2722.4167	0.0000	0.0000	0.8143	5.1376	7.9044
N_Link10	290.3333	2589.6667	0.0000	0.0000	1.0997	58.0346	1.7138
Runoff_N6	290.4394	2589.5606	0.0000	0.0000	0.5635	6.5403	1.9885
Roff_US_N1	109.6667	0.0000	0.0000	2770.3333	0.7171	9.7778	3.0720
N_Link14	214.7843	2665.2157	0.0000	0.0000	0.6428	9.9688	0.7566
N_Link13	235.3056	2644.6944	0.0000	0.0000	0.6304	10.7750	2.7112
Roff_MGNW1	126.6667	88.5000	0.0000	2664.8333	0.6842	8.9757	2.8005
Roff_US_N2	109.3333	0.0000	0.0000	2770.6667	0.9024	14.9402	4.7957
N_Link16	125.0000	88.3333	0.0000	2666.6667	0.7160	9.4604	5.6321
Roff_MGN1	725.8788	2154.1212	0.0000	0.0000	0.9247	15.3723	3.9355
Roff_MGN2	238.3016	2641.6984	0.0000	0.0000	0.7405	10.0707	2.9394
Runoff_N7	296.5606	2583.4394	0.0000	0.0000	0.3570	3.0016	0.5378
N_Link12	299.6458	2580.3542	0.0000	0.0000	0.6316	11.3980	6.8437
N_Link12.1	111.0000	2769.0000	0.0000	0.0000	0.4506	33.8858	1.5780
Runoff_N2.	109.6833	2770.3167	0.0000	0.0000	1.1890	25.7781	1.9753

Runoff_N1.	243.1437	2636.8563	0.0000	0.0000	1.0786	21.5545	1.0408
N_Link4	320.1667	2559.8333	0.0000	0.0000	1.7087	35.4386	8.5629
RR_br	319.8750	2560.1250	0.0000	0.0000	1.7943	43.7784	7.4189
USH14_NCul	219.3333	2660.6667	0.0000	0.0000	2.1297	42.8632	4.1304
LacyN1_Cul	151.0000	2729.0000	0.0000	0.0000	2.0317	37.3828	5.5927
280.1	135.5000	2744.5000	0.0000	0.0000	1.9279	35.3330	32.4881
Lacy_MCulv	135.5000	2744.5000	0.0000	0.0000	3.1231	91.9523	16.6164
284.1	132.5000	2747.5000	0.0000	0.0000	2.2264	59.7650	14.5081
USH14_SCul	165.2500	2714.7500	0.0000	0.0000	1.6211	21.8110	10.3542
EHill_Culv	158.2500	2721.7500	0.0000	0.0000	1.2764	10.3138	36.7867
SyeneS1Cul	185.3114	2694.6886	0.0000	0.0000	1.3699	15.2258	29.9536
Irish1Culv	253.0196	2626.9804	0.0000	0.0000	1.2440	14.7391	15.9831
Irish2Culv	1367.2889	1512.7111	0.0000	0.0000	0.5858	3.2919	10.2959
Irish3Culv	399.2673	2480.7327	0.0000	0.0000	1.0538	16.4764	11.2608
RR_S3Culv	158.0000	2722.0000	0.0000	0.0000	0.4454	2.0879	5.5385
Irish0Culv	117.6667	2762.3333	0.0000	0.0000	1.0501	9.6956	2.4393
SyeneN1_Cu	1162.0396	1717.9604	0.0000	0.0000	0.9314	6.6755	11.7986
LacyN2_Cul	1155.0352	1724.9648	0.0000	0.0000	0.9009	5.8454	17.9805
SyeneN2_Cu	199.5833	2680.4167	0.0000	0.0000	1.7227	18.9945	10.1164
SyeneN1_C	490.6667	721.9250	0.0000	1667.4083	0.5416	5.0339	1.9913
JonesFrm_C	134.1667	2745.8333	0.0000	0.0000	0.8926	9.7167	5.9912
573.1	217.3333	2662.6667	0.0000	0.0000	0.1445	0.2074	37.1045
592.1	670.8095	2209.1905	0.0000	0.0000	0.4382	1.6262	33.2100
SwnCrNout	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	136.1667	2743.8333	0.0000	0.0000	0.0286	0.0093	16.0157
3.25in	734.3583	0.0000	0.0000	2145.6417	0.0807	0.0584	7.2307

Table E12. Mean Conduit Flow Information								
Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
N_Link2	14.9817	2588844.7	0.0001	0.9803	0.7798	0.6281	10.6093	0.0500
N_Link1	17.5724	3036518.2	0.0002	0.9945	0.2116	0.8915	17.2898	0.0500
M_Link3	35.5008	6134533.2	0.0003	0.9982	0.2133	1.1432	25.4987	0.0500
M_Link2	36.5223	6311059.4	0.0003	0.9982	0.2098	1.2330	28.2386	0.0500
M_Link1	36.4857	6304726.3	0.0003	0.9541	0.5189	0.8894	18.5852	0.0500
M_Link0	36.7469	6349872.8	0.0004	0.9978	0.7089	0.7052	12.0030	0.0500
Runoff_N1	2.5985	449015.59	0.0001	0.5759	0.3425	0.2128	2.7202	0.0500
Runoff_M2	1.0569	182625.69	0.0001	0.5038	0.0066	0.7459	19.2596	0.0500
S_Link5	2.2333	385912.38	0.0000	0.9979	0.0470	0.4542	9.8454	0.0300
S_Link4	15.7515	2721857.9	0.0001	0.9986	0.1459	0.4485	31.7615	0.0500
S_Link3	16.7768	2899022.9	0.0001	0.9986	0.1470	0.5544	14.0416	0.0500
S_Link2	17.5475	3032214.4	0.0001	0.9982	0.5658	0.5498	8.3425	0.0500
S_Link1	17.9511	3101957.9	0.0001	0.9982	0.2650	0.6949	13.4035	0.0500
S_Link6	8.6012	1486283.7	0.0000	0.9986	0.1335	0.3417	9.4603	0.0500
Roff_MGNE1	0.3995	69038.538	0.0000	0.8320	0.0385	0.2227	3.1748	0.0500
Roff_MGE1	1.0838	187280.58	0.0002	0.6350	0.0115	0.8784	24.8687	0.0500
Roff_MGSE1	1.0488	181225.20	0.0001	0.6111	0.0225	0.6637	14.5219	0.0500
Runoff_S1	0.7779	134416.96	0.0001	0.5528	0.0031	0.8851	24.8708	0.0500
Runoff_S2	1.4618	252595.16	0.0001	0.6105	0.0091	0.6563	14.4888	0.0500
Roff_MGSE2	1.7525	302823.55	0.0001	0.9986	0.5924	0.1420	1.2464	0.0500
Runoff_S3	0.5634	97361.235	0.0000	0.9986	0.2011	0.3238	5.3947	0.0500
S_Link10	7.2717	1256542.3	0.0001	0.9760	0.3729	0.2746	3.8717	0.0500
S_Link9	8.0642	1393493.7	0.0001	0.9982	0.3726	0.3061	4.4374	0.0500
S_Link8	8.0678	1394117.5	0.0002	0.9954	1.0268	0.3286	4.9446	0.0500
S_Link7	8.0726	1394937.4	0.0000	0.9849	0.6658	0.4237	7.0503	0.0500
Runoff_S4	0.7933	137082.75	0.0000	0.9734	0.1312	0.1672	1.6509	0.0500
S_Link12	0.6875	118807.22	0.0000	0.8696	0.1570	0.1180	1.0181	0.0300
S_Link11	7.2631	1255070.1	0.0000	0.9986	0.5487	0.2397	2.7936	0.0300
S_Link14	4.7040	812847.56	0.0001	0.9579	0.4786	0.2056	2.2426	0.0300
S_Link13	4.6993	812042.03	0.0000	0.9649	0.5317	0.1787	1.7052	0.0300
Runoff_S6	1.1646	201246.07	0.0000	0.8301	0.1513	0.1470	1.5916	0.0500
Runoff_S5	1.8695	323044.97	0.0000	0.9615	0.2124	0.1668	1.5208	0.0500
Runoff_S8	1.1544	199475.81	0.0000	0.9983	0.0383	0.4072	5.7021	0.0500
Runoff_S7	1.5679	270937.45	0.0000	0.9956	0.0378	0.4019	5.6904	0.0500
Roff_MGSW2	0.8098	139933.32	0.0000	0.8725	0.0198	0.3982	5.6535	0.0500
Runoff_S9	0.4190	72410.359	0.0000	0.9282	0.1213	0.1160	1.1455	0.0500
Runoff_US1	0.4636	80107.959	0.0000	0.9986	0.6420	0.0732	0.4976	0.0500
Roff_MGSW1	0.2639	45597.793	0.0000	0.8730	0.0903	0.1086	1.0914	0.0500
S_Link15	2.0397	352462.89	0.0000	0.8588	0.0325	0.4712	10.0421	0.0300
S_link16	0.0000	0.0000	0.0000	0.0000	0.0000	0.2008	2.1473	0.0300
Runoff_S10	2.0841	360136.82	0.0000	0.9986	0.6107	0.1517	1.4062	0.0500
Runoff_S11	1.0822	187009.56	0.0000	0.5649	2.3500	0.1061	0.8832	0.0500
Roff_MGNE3	1.1974	206904.19	0.0000	0.9987	0.2402	0.1453	1.3301	0.0500
Roff_MGNE2	0.8898	153752.25	0.0000	0.5777	0.2044	0.1211	0.9675	0.0500
N_Link6	2.0871	360659.19	0.0000	0.7799	0.3708	0.1553	1.4644	0.0300

N_Link5	2.0557	355225.28	0.0002	0.9981	0.2343	0.2030	1.9281	0.0300
N_Link3	13.0814	2260467.8	0.0001	0.9986	0.3892	0.6314	9.5943	0.0500
N_Link7	1.2039	208025.70	0.0000	0.9018	0.0241	0.4239	18.0182	0.0300
N_Link9	7.9089	1366656.9	0.0000	0.9978	0.1166	0.6496	50.7248	0.0500
N_Link8	1.2117	209376.03	0.0000	0.5223	0.3514	0.0488	1.9746	0.0300
Runoff_N2	1.9242	332499.50	0.0000	0.9901	0.1842	0.3083	4.2851	0.0500
Runoff_N3	1.2059	208385.83	0.0000	0.9986	0.4483	0.1062	0.9208	0.0500
Runoff_N8	2.0127	347802.74	0.0000	0.9985	0.1804	0.3956	5.2453	0.0500
Runoff_N5	1.1607	200565.09	0.0000	0.9848	0.2330	0.1511	1.2411	0.0500
NonameRd	5.7723	997448.08	0.0000	0.9981	1.7343	0.1105	0.6094	0.0140
N_Link11.1	5.7385	991616.39	0.0000	0.9936	1.2923	0.1825	0.8846	0.0140
N_Link11	6.6475	1148681.7	0.0001	0.9983	0.9393	0.2168	2.6012	0.0500
LacyRd_N3b	6.7698	1169830.0	0.0000	0.9975	0.9773	0.2379	1.3427	0.0140
LacyRd_N3a	6.7687	1169632.8	0.0000	0.9974	1.1277	0.2442	0.9070	0.0140
N_Link10	6.7613	1168345.3	0.0000	0.9806	0.3311	0.1744	8.8859	0.0500
Runoff_N6	0.5426	93758.006	0.0000	0.9561	0.2655	0.0939	0.6005	0.0500
Roff_US_N1	0.7770	134259.68	0.0000	0.9987	0.5858	0.0958	0.6837	0.0500
N_Link14	0.5965	103067.10	0.0000	0.9927	0.2020	0.2193	1.9552	0.0300
N_Link13	1.9504	337031.15	0.0000	0.9899	0.3756	0.2714	1.6408	0.0500
Roff_MGNW1	0.7561	130650.32	0.0000	0.9983	0.6458	0.0925	0.7009	0.0500
Roff_US_N2	1.3192	227964.36	0.0001	0.9987	0.5744	0.1185	0.9455	0.0500
N_Link16	1.3074	225922.60	0.0000	0.9985	1.2080	0.0964	0.6567	0.0300
Roff_MGN1	1.4483	250265.05	0.0000	0.8719	0.0855	0.2434	2.3366	0.0500
Roff_MGN2	0.9111	157429.62	0.0000	0.9701	0.1882	0.1462	1.1419	0.0500
Runoff_N7	0.1234	21329.003	0.0000	0.9550	0.0959	0.0909	0.5506	0.0500
N_Link12	3.9908	689609.80	0.0001	0.9789	0.5922	0.2660	1.6432	0.0500
N_Link12.1	5.2325	904174.10	0.0001	0.9987	0.5379	0.1379	5.9920	0.0500
Runoff_N2.	0.4145	71629.276	0.0000	0.9987	0.0670	0.2992	3.5412	0.0500
Runoff_N1.	0.2657	45919.493	0.0000	0.9689	0.1047	0.2058	2.5039	0.0500
N_Link4	12.7773	2207922.7	0.0002	0.9750	0.3220	0.5911	8.5182	0.0500
RR_br	12.7827	2208854.6	0.0084	0.9750	0.4988	0.4552	9.9156	0.0300
USH14_NCul	14.9966	2591408.0	0.0001	0.9921	0.1027	0.9089	15.4911	0.0140
LacyN1_Cul	17.5781	3037502.1	0.0001	0.9977	0.8485	0.4754	7.1924	0.0140
280.1	30.9684	5351337.1	0.0003	0.9982	0.3616	0.9618	11.2982	0.0500
Lacy_MCulv	36.5050	6308068.4	0.0003	0.9982	0.2153	1.2224	28.8571	0.0240
284.1	36.7496	6350327.9	0.0003	0.9983	0.6075	0.6604	15.8965	0.0240
USH14_SCul	17.9480	3101410.9	0.0001	0.9970	0.5418	0.3860	4.0563	0.0140
EHill_Culv	7.2653	1255439.6	0.0001	0.9974	2.2108	0.2417	1.0938	0.0240
SyeneS1Cul	8.0653	1393683.7	0.0002	0.9957	0.9511	0.2997	1.9626	0.0240
Irish1Culv	8.0690	1394325.8	0.0001	0.9872	1.1645	0.2496	1.7801	0.0240
Irish2Culv	0.6833	118065.88	0.0000	0.4975	0.7164	0.0945	0.2390	0.0240
Irish3Culv	-3.5300	-609976.2	0.0001	0.9581	0.0000	0.5339	5.7230	0.0240
RR_S3Culv	1.0818	186928.85	0.0000	0.9974	1.8779	0.3079	1.7739	0.0240
Irish0Culv	2.0814	359671.91	0.0000	0.9986	0.0542	0.5092	3.8708	0.0240
SyeneN1_Cu	1.1973	206890.89	0.0000	0.6561	0.6337	0.1371	0.5019	0.0240
LacyN2_Cul	2.0871	360658.93	0.0001	0.6637	0.5956	0.1635	0.5837	0.0240
SyeneN2_Cu	10.7089	1850505.3	0.0003	0.9944	0.0977	1.0253	7.8575	0.0240
SyeneN1_C	1.2005	207447.64	0.0000	0.9385	0.6216	0.0590	0.5020	0.0140
JonesFrm_C	7.9171	1368073.8	0.0001	0.9982	1.4248	0.1545	1.3797	0.0140
573.1	1.0765	186021.90	0.0000	0.9921	1.6018	0.1252	0.1862	0.0300
592.1	1.2278	212161.29	0.0000	0.8467	2.6250	0.0912	0.1405	0.0140
SwnCrNout	3.1241	539837.92	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	3.4166	590393.67	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	0.0691	11946.053	0.0000	0.9979	5.5204	0.0260	0.0081	0.0009
3.25in	0.2235	38628.419	0.0000	0.8682	1.6780	0.0603	0.0493	0.0018
USH14_NOvr	0.0000	0.0000						
LacyN1_Ovr	0.0000	0.0000						
PrivateDr	5.5773	963751.47						
Lacy_MOvr	0.0000	0.0000						
MM_ovr	0.0000	0.0000						
USH14_SOvr	0.0000	0.0000						
EHill_Ovr.1	0.0000	0.0000						
SyeneS1_Ovr	0.0000	0.0000						
irish1_Ovr.1	0.0000	0.0000						
Irish2Ovr	0.0000	0.0000						
Irish3Ovr	0.0000	0.0000						
RR_S3_Ovr	0.0000	0.0000						
irish0_Ovr.1	0.0000	0.0000						
SyeneN1_Ov	0.0000	0.0000						
LacyN2_Ovr	0.0000	0.0000						
SyeneN2_Ov	0.0000	0.0000						
SyeneN1_Ov.1	0.0000	0.0000						
JonesFrm_O	0.0000	0.0000						
Lacy_N3_Ov.1	0.0000	0.0000						
StandPipe	0.3049	52682.671						
QuarryOvr	0.0000	0.0000						
Weir	0.8781	151740.44						
NobelWeir	0.0927	16022.338						
SwnCrWeirN	0.0000	0.0000						
SwanCkSout.1	4.1738	721229.35						

Weir10	10.7128	1851172.0
weir11	0.0010	178.7146
weir14	0.0000	0.0000
weirtop	0.0000	0.0000
RR_S4out	0.0000	0.0000
FREE # 1	36.7470	6349874.2

Table E18 - Junction Continuity Error. Division by Volume added 11/96

Continuity Error = Net Flow + Beginning Volume - Ending Volume / Total Flow + (Beginning Volume + Ending Volume)/2

Net Flow = Node Inflow - Node Outflow
Total Flow = absolute (Inflow + Outflow)
Intermediate column is a judgement on the node continuity error.

Excellent < 1 percent Great 1 to 2 percent Good 2 to 5 percent
Fair 5 to 10 percent Poor 10 to 25 percent Bad 25 to 50 percent
Terrible > 50 percent

Junction Name	<------Continuity Error -------> Volume	% of Node	% of Inflow	Remaining Volume	Beginning Volume	Net Flow Thru Node	Total Flow Thru Node	Failed to Converge
N1	1057.3981	0.0204	0.0159	1506.2149	0.0000	2563.6130	5180252.756	0
USH14_NDet	-5626.2861	-0.1084	0.0843	7190.5437	0.0000	1564.2576	5184375.388	0
LacyRd_Det	-284.2730	-0.0047	0.0043	644.8149	0.0000	360.5419	6075362.410	0
N0	71.0099	0.0012	0.0011	923.2151	0.0000	994.2250	6074020.337	0
M7	1563.7428	0.0127	0.0234	2395.8569	0.0000	3959.5997	12273009.39	0
S0	-819.7444	-0.0132	0.0123	302.1826	0.0000	-517.5618	6203368.810	0
S1	-215.4688	-0.0035	0.0032	57.2217	0.0000	-158.2471	6202663.831	0
S2	1094.3754	0.0180	0.0164	128.0779	0.0000	1222.4533	6065654.266	0
M6	555.3334	0.0044	0.0083	1517.3800	0.0000	2072.7134	12632247.49	0
M5	1566.3485	0.0124	0.0235	2461.5893	0.0000	4027.9378	12626148.01	0
M4	449.4401	0.0036	0.0067	2541.6998	0.0000	2991.1399	12619127.85	0
M3	1917.4748	0.0152	0.0287	1424.8217	0.0000	3342.2965	12612794.67	0
M1	-1085.0949	-0.0085	0.0163	1410.2619	0.0000	325.1670	12700973.65	0
M0	238.1740	0.0019	0.0036	221.1950	0.0000	459.3690	12700200.74	0
M_out	-98.1018	-0.0008	0.0015	97.0388	0.0000	-1.0630	12699747.01	0
D-S_N1	-231.9627	-0.0258	0.0035	4.3394	0.0000	-227.6233	897804.5554	0
D-S_M2	-128.5679	-0.0352	0.0019	24.1279	0.0000	-104.4401	365143.5570	0
S3	9984.9742	0.1719	0.1497	132.7088	0.0000	10117.6830	5808161.422	0
S4	-63667.4271	-1.1833	0.9544	289.3170	0.0000	-63378.1101	5380337.275	0
S6	5957.2562	0.2000	0.0893	55.8870	0.0000	6013.1432	2978582.367	0
S5	-2959.6434	-0.3849	0.0444	51.8125	0.0000	-2907.8309	768843.8882	0
McGaw_NE1	-103.6167	-0.0751	0.0016	0.5227	0.0000	-103.0940	137975.1383	0
McGaw_E1	-17.1857	-0.0046	0.0003	4.5246	0.0000	-12.6612	374547.3664	0
McGaw_SE1	33.6431	0.0093	0.0005	3.9577	0.0000	37.6008	362484.0798	0
D-S_S1	-25.3573	-0.0094	0.0004	7.1887	0.0000	-18.1686	268815.2290	0
D-S_S2	14.4200	0.0029	0.0002	3.9577	0.0000	18.3777	505207.2137	0
McGaw_SE2	-49.1910	-0.0081	0.0007	0.0092	0.0000	-49.1818	605626.5118	0
D-S_S3	-53.1602	-0.0273	0.0008	0.0059	0.0000	-53.1542	194667.1027	0
S7	-624.0716	-0.0224	0.0094	10.3039	0.0000	-613.7678	2789263.255	0
S8	-218.9172	-0.0079	0.0033	6.8955	0.0000	-212.0218	2788443.348	0
S9	-437.2071	-0.0157	0.0066	6.1643	0.0000	-431.0427	2787801.247	0
S10	-196.7666	-0.0071	0.0029	6.0765	0.0000	-190.6901	2787177.457	0
S11	118.4536	0.0043	0.0018	8.5123	0.0000	126.9659	2787118.796	0
S12	-1105.9837	-0.0440	0.0166	2.4731	0.0000	-1103.5106	2511981.971	0
EHill_DetS	-370.3737	-0.0148	0.0056	2.2786	0.0000	-368.0951	2510509.710	0
D-S_S4	-70.2836	-0.0256	0.0011	0.1100	0.0000	-70.1736	274095.9306	0
S13	-1180.9371	-0.0471	0.0177	3.4546	0.0000	-1177.4825	2508964.288	0
S14	-742.9540	-0.3136	0.0111	1.1148	0.0000	-741.8393	236873.1045	0
S16	803.1460	0.0494	0.0120	2.2184	0.0000	805.3644	1624889.590	0
S17	-1681.4081	-0.1035	0.0252	56.5782	0.0000	-1624.8299	1624069.787	0
S18	68.5866	0.0056	0.0010	303.6488	0.0000	372.2354	1220322.746	0
S15	-59.8360	-0.0253	0.0009	0.0052	0.0000	-59.8309	236074.0349	0
D-S_S6	-82.6660	-0.0205	0.0012	0.0005	0.0000	-82.6655	402406.3860	0
D-S_S5	-97.6281	-0.0151	0.0015	0.0620	0.0000	-97.5661	645991.7296	0
D-S_S8	-176.9422	-0.0444	0.0027	79.6027	0.0000	-97.3394	398855.7735	0
D-S_S7	-124.4113	-0.0230	0.0019	79.5966	0.0000	-44.8147	541831.4929	0
McGaw_SW2	-166.4960	-0.0595	0.0025	79.5780	0.0000	-86.9180	279777.1224	0
D-S_S9	-25.3802	-0.0175	0.0004	0.0024	0.0000	-25.3778	144796.2791	0
U-S_S1	272.9677	0.1701	0.0041	0.0089	0.0000	272.9767	160488.9937	0
McGaw_SW1	-44.7933	-0.0491	0.0007	0.0023	0.0000	-44.7910	91151.0634	0
RR_Det3	-11.3613	-0.0030	0.0002	92.8226	0.0000	81.4613	373938.4097	0
RR_Det4	28326.2754	10.6398	0.4246	158601.9693	0.0000	186928.2447	186928.8499	0
S19	6888.5168	0.9671	0.1033	320.6546	0.0000	7209.1714	712134.7949	0
Irish_Det0	-208.0835	-0.0289	0.0031	673.5094	0.0000	465.4260	719808.7320	0

D-S_S10	-25.8513	-0.0036	0.0004	0.0097	0.0000	-25.8416	720248.0244	0
D-S_S11	-24.5730	-0.0066	0.0004	0.0685	0.0000	-24.5045	373994.7030	0
N2	14352.9924	0.3160	0.2152	4735.6853	0.0000	19088.6778	4540019.787	0
N3	-4035.4641	-0.0914	0.0605	825.3326	0.0000	-3210.1315	4414585.141	0
N5	5250.8071	0.7335	0.0787	42.0733	0.0000	5292.8804	715884.2084	0
N6	0.6735	0.0001	0.0000	0.0017	0.0000	0.6753	721318.1142	0
N7	-13.8602	-0.0019	0.0002	0.0008	0.0000	-13.8593	721302.3341	0
N8	13.7108	0.0033	0.0002	0.0027	0.0000	13.7135	413795.0843	0
N4	87.0026	0.0024	0.0013	753.4757	0.0000	840.4783	3701856.016	0
SwanCk_N	1885.5561	0.1710	0.0283	14104.8938	0.0000	15990.4499	1095666.369	0
SwanCk_S	21496.0728	0.7976	0.3222	33556.4280	0.0000	55052.5008	2678279.921	0
McGaw_NE3	-26.4029	-0.0064	0.0004	0.0029	0.0000	-26.4000	413779.4539	0
McGaw_NE2	7.4791	0.0024	0.0001	0.0005	0.0000	7.4796	307508.9384	0
N10	1929.3614	0.4629	0.0289	0.1359	0.0000	1929.4973	416823.6652	0
N9	-1097.5308	-0.2640	0.0165	519.8125	0.0000	-577.7183	415473.3414	0
N12	-231.3658	-0.0085	0.0035	1049.4028	0.0000	818.0371	2736984.147	0
N11	-8456.3763	-0.3087	0.1268	9870.7862	0.0000	1414.4099	2734730.652	0
N10.1	-990.2147	-0.2370	0.0148	0.1314	0.0000	-990.0833	417761.8567	0
D-S_N2	506.1198	0.0760	0.0076	2.8939	0.0000	509.0137	665509.0895	0
D-S_N3	-34.3933	-0.0083	0.0005	0.0031	0.0000	-34.3902	416737.3035	0
D-S_N8	-209.1601	-0.0301	0.0031	11.0655	0.0000	-198.0947	695407.7397	0
D-S_N5	-95.0010	-0.0237	0.0014	3.3501	0.0000	-91.6509	401041.9698	0
N13	216.5573	0.0093	0.0032	1071.4638	0.0000	1288.0210	2337978.102	0
N14	116.0983	0.0050	0.0017	81.1500	0.0000	197.2483	2339462.767	0
N15	1.7255	0.0001	0.0000	179.4792	0.0000	181.2047	2339840.660	0
CrossDetE	919.6245	0.0462	0.0138	4915.7222	0.0000	5835.3467	1989064.469	0
CrossDetW	-771.7759	-0.0387	0.0116	1257.3788	0.0000	485.6030	1995380.193	0
N16	192.7461	0.0084	0.0029	172.1125	0.0000	364.8586	2297727.699	0
QuarryHDet	4212.4431	1.6788	0.0631	26791.5786	0.0000	31004.0217	237516.8273	0
TechDet	208.9719	0.0297	0.0031	18603.6274	0.0000	18812.5993	694335.2625	0
D-S_N6	-15.2207	-0.0081	0.0002	2.3161	0.0000	-12.9046	187503.0435	0
U-S_N1	-27.2047	-0.0101	0.0004	0.0089	0.0000	-27.1958	268492.7078	0
N19	-290.4711	-0.1406	0.0044	480.5752	0.0000	190.1041	206324.2443	0
N17	-115.8421	-0.0084	0.0017	870.9103	0.0000	755.0682	1379973.103	0
N18	499.0228	0.0739	0.0075	232.8594	0.0000	731.8823	674793.4904	0
McGaw_NW1	246.4619	0.0942	0.0037	0.0092	0.0000	246.4711	261549.0600	0
U-S_N2	-51.7441	-0.0114	0.0008	0.0089	0.0000	-51.7353	455878.1705	0
NobelDrDet	-219.3211	-0.0481	0.0033	0.0094	0.0000	-219.3117	456147.9955	0
N20	2258.4279	0.4973	0.0339	2.3168	0.0000	2260.7447	454106.2317	0
McGaw_N1	-157.5288	-0.0315	0.0024	23.4513	0.0000	-134.0775	500402.8246	0
McGaw_N2	-111.7717	-0.0355	0.0017	6.4611	0.0000	-105.3105	314754.1983	0
D-S_N7	-16.7872	-0.0394	0.0003	4.0728	0.0000	-12.7144	42645.2651	0
D-S_N6.1	295.6740	0.0163	0.0044	373.1904	0.0000	668.8644	1809016.867	0
D-S_N2.1	-172.8236	-0.1207	0.0026	41.3966	0.0000	-131.4270	143127.2230	0
D-S_N1.1	-64.4647	-0.0702	0.0010	5.8672	0.0000	-58.5975	91780.8917	0
N3.1	88.7286	0.0020	0.0013	846.6582	0.0000	935.3868	4416777.247	0
SwanCk_C	45.3158	0.0012	0.0007	282.6278	207.8849	120.0587	3702811.677	0
Node36	-341.8204	0.0000	0.0051	341.8204	0.0000	0.0000	0.0000	0

The total continuity error was 15225. cubic feet
The remaining total volume was 3.05801E+05 cubic feet
Your mean node continuity error was Excellent
Your worst node continuity error was Excellent

Selected XP-SWMM Output, Predevelopment Conditions, 100-year event
Expanded model for resource impact analysis

```
#####################################
# Rainfall input summary from Runoff #
#####################################

 Total rainfall for gage #     1 is    6.0000 inches


        ################################################
        # Table R9. Summary Statistics for Subcatchments #
        ################################################

 Note: Total Runoff Depth includes pervious & impervious area
       Pervious and Impervious Runoff Depth is only the runoff from those two areas.
```

Subcatchment.....	D-S_N2.1#1	D-S_N2.1#2	McGaw_NE2#1	McGaw_NE2#2	McGaw_NE3#1	McGaw_NE3#2
Area (acres).....	6.64500	4.42800	8.01300	38.08500	9.17900	70.61900
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.27231	0.00000	2.56379	0.00000	2.35009
Total Losses (in).....	0.00000	3.72769	0.00000	3.43621	0.00000	3.64991
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	9.78879	0.00000	61.11555	0.00000	121.21941
Total Impervious Area						
Total Runoff Depth (in)	5.78455	0.00000	5.79725	0.00000	5.78057	0.00000
Peak Runoff Rate (cfs).	30.41760	0.00000	27.14087	0.00000	35.50904	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78455	2.27231	5.79725	2.56379	5.78057	2.35009
Peak Runoff Rate (cfs).	30.41760	9.78879	27.14087	61.11555	35.50904	121.21941
Unit Runoff (in/hr)....	4.57752	2.21066	3.38710	1.60471	3.86851	1.71653
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N3#1	D-S_N3#2	D-S_N8#1	D-S_N8#2	D-S_N5#1	D-S_N5#2
Area (acres).....	0.87800	93.32300	26.85300	84.94700	17.00800	33.56600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.65704	0.00000	1.87280	0.00000	1.89080
Total Losses (in).....	0.00000	3.34296	0.00000	4.12720	0.00000	4.10920
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	193.12783	0.00000	56.22107	0.00000	27.83671
Total Impervious Area						
Total Runoff Depth (in)	5.78098	0.00000	5.79086	0.00000	5.79500	0.00000
Peak Runoff Rate (cfs).	3.53674	0.00000	56.26915	0.00000	43.99985	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78098	2.65704	5.79086	1.87280	5.79500	1.89080
Peak Runoff Rate (cfs).	3.53674	193.12783	56.26915	56.22107	43.99985	27.83671
Unit Runoff (in/hr)....	4.02818	2.06946	2.09545	0.66184	2.58701	0.82931
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N6#1	D-S_N6#2	U-S_N1#1	U-S_N1#2	McGaw_NW1#1	McGaw_NW1#2
Area (acres).....	5.48900	22.96600	11.07700	23.50500	0.02200	51.07300
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.41235	0.00000	1.96208	0.00000	2.90427
Total Losses (in).....	0.00000	3.58765	0.00000	4.03792	0.00000	3.09573
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	40.61425	0.00000	41.66566	0.00000	113.16478
Total Impervious Area						
Total Runoff Depth (in)	5.78057	0.00000	5.78266	0.00000	5.77282	0.00000
Peak Runoff Rate (cfs).	21.23424	0.00000	49.62053	0.00000	0.08636	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78057	2.41235	5.78266	1.96208	5.77282	2.90427
Peak Runoff Rate (cfs).	21.23424	40.61425	49.62053	41.66566	0.08636	113.16478
Unit Runoff (in/hr)....	3.86851	1.76845	4.47960	1.77263	3.92562	2.21575
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	U-S_N2#1	U-S_N2#2	McGaw_N1#2	D-S_N6.1#1	D-S_N6.1#2	McGaw_N2#1
Area (acres).....	21.83900	13.75600	97.46400	16.53900	46.47000	2.41500
Percent Impervious.....	100.00000	0.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	1.99814	2.91298	0.00000	1.99524	0.00000
Total Losses (in).....	0.00000	4.00186	3.08702	0.00000	4.00476	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	25.56373	185.63875	0.00000	69.77865	0.00000
Total Impervious Area						
Total Runoff Depth (in)	5.76495	0.00000	0.00000	5.78098	0.00000	5.79487
Peak Runoff Rate (cfs).	98.74071	0.00000	0.00000	66.62209	0.00000	8.93879
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.76495	1.99814	2.91298	5.78098	1.99524	5.79487
Peak Runoff Rate (cfs).	98.74071	25.56373	185.63875	66.62209	69.77865	8.93879
Unit Runoff (in/hr)....	4.52130	1.85837	1.90469	4.02818	1.50158	3.70136
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#2	D-S_N7#1	D-S_N7#2	D-S_N2#1	D-S_N2#2	D-S_N1#1
Area (acres).....	59.01300	0.54400	14.63800	0.05500	200.61100	1.09300
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.73737	0.00000	1.93449	0.00000	2.34714	0.00000
Total Losses (in).....	3.26263	0.00000	4.06551	0.00000	3.65286	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	113.17953	0.00000	22.70834	0.00000	338.89965	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.77551	0.00000	5.79514	0.00000	5.79668
Peak Runoff Rate (cfs).	0.00000	2.29211	0.00000	0.21154	0.00000	3.08678
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.73737	5.77551	1.93449	5.79514	2.34714	5.79668
Peak Runoff Rate (cfs).	113.17953	2.29211	22.70834	0.21154	338.89965	3.08678
Unit Runoff (in/hr)....	1.91787	4.21345	1.55133	3.84618	1.68934	2.82413
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N1#2	McGaw_SE2#1	McGaw_SE2#2	U-S_S1#1	U-S_S1#2	D-S_S3#1
Area (acres).....	184.35100	4.08100	135.50300	0.07600	35.85200	4.73300
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.80343	0.00000	2.53353	0.00000	2.70946	0.00000
Total Losses (in).....	3.19657	0.00000	3.46647	0.00000	3.29054	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	269.73310	0.00000	261.83521	0.00000	85.71524	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.79044	0.00000	5.79464	0.00000	5.79044

Peak Runoff Rate (cfs).	0.00000	16.26729	0.00000	0.33490	0.00000	18.86623
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.80343	5.79044	2.53353	5.79464	2.70946	5.79044
Peak Runoff Rate (cfs).	269.73310	16.26729	261.83521	0.33490	85.71524	18.86623
Unit Runoff (in/hr)....	1.46315	3.98610	1.93232	4.40661	2.39081	3.98610
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S3#2	D-S_S9#1	D-S_S9#2	McGaw_SW1#2	D-S_S6#2	D-S_S8#1
Area (acres).....	44.03800	0.00400	28.23400	17.74300	84.15200	5.11800
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	1.99004	0.00000	2.90837	2.91403	2.81048	0.00000
Total Losses (in).....	4.00996	0.00000	3.09163	3.08597	3.18952	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	64.49235	0.00000	64.29462	44.46243	158.38667	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.78098	0.00000	0.00000	0.00000	5.79187
Peak Runoff Rate (cfs).	0.00000	0.01611	0.00000	0.00000	0.00000	13.48996
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	1.99004	5.78098	2.90837	2.91403	2.81048	5.79187
Peak Runoff Rate (cfs).	64.49235	0.01611	64.29462	44.46243	158.38667	13.48996
Unit Runoff (in/hr)....	1.46447	4.02818	2.27721	2.50591	1.88215	2.63579
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S8#2	D-S_S7#1	D-S_S7#2	McGaw_SW2#2	D-S_S5#1	D-S_S5#2
Area (acres).....	86.82700	0.04900	110.86000	59.30400	7.77400	118.67600
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.39027	0.00000	2.84005	2.79070	0.00000	2.62273
Total Losses (in).....	3.60973	0.00000	3.15995	3.20930	0.00000	3.37727
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	98.24648	0.00000	179.33265	140.05567	0.00000	193.01594
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.79495	0.00000	0.00000	5.78616	0.00000
Peak Runoff Rate (cfs).	0.00000	0.15044	0.00000	0.00000	26.02090	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.39027	5.79495	2.84005	2.79070	5.78616	2.62273
Peak Runoff Rate (cfs).	98.24648	0.15044	179.33265	140.05567	26.02090	193.01594
Unit Runoff (in/hr)....	1.13152	3.07028	1.61765	2.36166	3.34717	1.62641
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S4#1	D-S_S4#2	McGaw_SE1#1	McGaw_SE1#2	D-S_S2#1	D-S_S2#2
Area (acres).....	7.78200	52.11100	8.56900	49.69400	0.12400	103.73900
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	0.00000	1.99936	0.00000	2.55092	0.00000	2.83077
Total Losses (in).....	0.00000	4.00064	0.00000	3.44908	0.00000	3.16923
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	49.61726	0.00000	91.04462	0.00000	216.19093
Total Impervious Area						

Total Runoff Depth (in)	5.79291	0.00000	5.78870	0.00000	5.79514	0.00000
Peak Runoff Rate (cfs).	21.47373	0.00000	32.60270	0.00000	0.47693	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.79291	1.99936	5.78870	2.55092	5.79514	2.83077
Peak Runoff Rate (cfs).	21.47373	49.61726	32.60270	91.04462	0.47693	216.19093
Unit Runoff (in/hr)....	2.75941	0.95215	3.80473	1.83210	3.84618	2.08399
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S11#1	D-S_S11#2	D-S_S10#1	D-S_S10#2	McGaw_E1#1	McGaw_E1#2
Area (acres).....	11.71100	51.90000	1.74400	153.66700	3.37700	68.40100
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	0.00000	2.17044	0.00000	2.71445	0.00000	2.72695
Total Losses (in).....	0.00000	3.82956	0.00000	3.28555	0.00000	3.27305
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	0.00000	72.71709	0.00000	248.59235	0.00000	141.75207
Total Impervious Area						
Total Runoff Depth (in)	5.79194	0.00000	5.78554	0.00000	5.77282	0.00000
Peak Runoff Rate (cfs).	41.72558	0.00000	5.59892	0.00000	13.25681	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.79194	2.17044	5.78554	2.71445	5.77282	2.72695
Peak Runoff Rate (cfs).	41.72558	72.71709	5.59892	248.59235	13.25681	141.75207
Unit Runoff (in/hr)....	3.56294	1.40110	3.21039	1.61773	3.92562	2.07237
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S1#2	McGaw_NE1#2	D-S_M2#2	D-S_N1.1#1	D-S_N1.1#2
Area (acres).....	57.90000	26.42000	85.03900	2.47000	13.36200
Percent Impervious.....	0.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area					
Total Runoff Depth (in)	2.76530	2.93394	2.66342	0.00000	2.32930
Total Losses (in).....	3.23470	3.06606	3.33658	0.00000	3.67070
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	133.26034	64.68518	158.16037	0.00000	21.32593
Total Impervious Area					
Total Runoff Depth (in)	0.00000	0.00000	0.00000	5.79487	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	9.14236	0.00000
Impervious Area with depression storage					
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage					
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area					
Total Runoff Depth (in)	2.76530	2.93394	2.66342	5.79487	2.32930
Peak Runoff Rate (cfs).	133.26034	64.68518	158.16037	9.14236	21.32593
Unit Runoff (in/hr)....	2.30156	2.44834	1.85986	3.70136	1.59601
Rational Formula					
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000

===> Runoff simulation ended normally.

Table E10 - CONDUIT SUMMARY STATISTICS
Note: The peak flow may be less than the design flow and the conduit may still surcharge because of the downstream boundary conditions.
* denotes an open conduit that has been overtopped

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|   this is a potential source of severe errors        |
*======================================================*
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Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Upstream (ft)	Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS	
N_Link2	768.8495	2.5628	120.0000	461.1603	13	50	3.1279	12	37	0.5998	876.0956	875.9598	.8096	.8160	
N_Link1	1746.275	5.8209	120.0000	656.3765	16	7	2.9043	17	27	0.3759	875.7782	875.7211	.9278	1.072	*
M_Link3	1360.783	4.5359	120.0000	1043.782	13	47	3.4882	13	34	0.7670	875.7211	874.5499	1.072	1.155	*
M_Link2	754.4772	2.5149	120.0000	1057.827	14	35	3.5261	14	35	1.4021	874.3706	872.4058	1.187	1.090	*
M_Link1	1332.969	4.4432	120.0000	1057.436	14	39	5.8229	14	39	0.7933	869.8222	864.1805	.8822	.5181	
M_Link0	2772.126	9.2404	120.0000	1060.434	14	41	8.7395	14	41	0.3825	864.1569	862.0573	.6157	.5057	
Runoff_N1	397.6640	4.9708	48.0000	271.2319	13	2	3.4458	12	28	0.6821	875.9725	875.9598	1.793	2.040	*
Runoff_M2	397.6640	4.9708	48.0000	153.1281	12	45	1.9141	12	45	0.3851	874.5524	874.5499	2.638	2.887	*
S_Link5	924.5090	11.5564	48.0000	354.0632	12	41	6.1604	12	41	0.3830	915.0640	893.2668	.6660	1.316	*
S_Link4	14789.99	7.3898	128.4000	1136.678	13	16	1.9217	13	11	0.0769	893.2668	887.4580	.4922	.6970	
S_Link3	31616.76	5.6502	204.0000	1147.561	13	23	2.1771	12	53	0.0363	887.4580	884.8156	.4387	.5362	
S_Link2	5144.586	4.2842	138.0000	1191.713	13	29	4.4215	12	52	0.2316	884.8156	877.9427	.7927	.8385	
S_Link1	2559.189	8.5306	120.0000	1088.119	13	39	4.6971	13	30	0.4252	876.1880	875.7211	.8188	1.072	*
S_Link6	17774.31	8.8809	128.4000	794.9355	13	9	2.9013	13	7	0.0447	912.1361	893.2668	.4333	.4922	
Roff_MGNE1	397.6640	4.9708	48.0000	62.9964	12	38	2.4040	12	21	0.1584	877.9439	877.9427	2.161	2.410	*
Roff_MGE1	397.6640	4.9708	48.0000	151.2103	12	43	1.8901	12	43	0.3802	887.4729	887.4580	1.618	1.864	*
Roff_MGSE1	397.6640	4.9708	48.0000	121.9963	12	44	2.6817	1	15	0.3068	893.2854	893.2668	1.071	1.316	*
Runoff_S1	397.6640	4.9708	48.0000	131.1179	12	38	1.6389	12	38	0.3297	884.8213	884.8156	2.030	2.278	*
Runoff_S2	397.6640	4.9708	48.0000	215.1688	12	43	2.8401	12	39	0.5411	893.3127	893.2668	1.078	1.316	*
Roff_MGSE2	397.6640	4.9708	48.0000	277.7341	12	42	5.3235	12	42	0.6984	917.2909	915.4742	.8727	.6685	
Runoff_S3	397.6640	4.9708	48.0000	82.4446	12	42	2.2608	12	37	0.2073	912.1494	912.1361	.7873	1.034	*
S_Link10	2845.702	9.4857	120.0000	740.5822	12	56	6.7268	12	56	0.2602	943.0210	933.2989	.5421	.5299	
S_Link9	3117.276	10.3909	120.0000	798.5437	12	59	5.6729	12	58	0.2562	933.2989	925.5006	.5299	.7301	
S_Link8	2222.646	7.4088	120.0000	796.5543	13	1	5.2764	13	0	0.3584	923.9669	921.8777	.6267	.6878	
S_Link7	2600.485	8.6683	120.0000	789.3276	13	3	6.8334	13	4	0.3035	920.9439	912.3298	.6344	.4330	
Runoff_S4	397.6640	4.9708	48.0000	71.8125	13	4	1.7147	1	18	0.1806	933.3310	933.2989	1.082	1.324	*
S_Link12	927.9977	11.6000	48.0000	106.2032	12	41	4.4278	14	0	0.1144	979.3556	955.5288	.3889	.8822	
S_Link11	1127.020	14.0877	48.0000	740.9990	12	53	11.1802	12	38	0.6575	955.5288	948.6801	.8822	2.170	*
S_Link14	527.8312	6.5979	48.0000	456.9541	13	12	7.0059	13	6	0.8657	986.9178	975.1153	1.479	.7788	*
S_Link13	834.3540	10.4294	48.0000	460.8085	12	49	8.9069	12	48	0.5523	975.1153	955.5288	.7788	.8822	
Runoff_S6	397.6640	4.9708	48.0000	155.4709	12	46	2.2194	12	29	0.3910	987.0023	986.9178	1.250	1.479	*
Runoff_S5	397.6640	4.9708	48.0000	218.6549	12	51	4.1866	12	42	0.5498	956.1758	955.5288	.7939	.8822	
Runoff_S8	397.6640	4.9708	48.0000	112.8109	13	9	2.4848	1	21	0.2837	987.4606	987.3820	1.540	1.770	*
Runoff_S7	397.6640	4.9708	48.0000	179.3063	12	56	2.2413	12	56	0.4509	987.5716	987.3820	1.567	1.770	*
Roff_MGSW2	397.6640	4.9708	48.0000	139.4888	12	38	1.7436	12	38	0.3508	987.3984	987.3820	1.524	1.770	*
Runoff_S9	397.6640	4.9708	48.0000	64.7860	12	42	1.0682	12	42	0.1629	983.1758	983.1344	.7439	.9836	
Runoff_US1	397.6640	4.9708	48.0000	86.0515	12	37	3.3369	12	28	0.2164	915.8665	915.0640	.5166	.5660	
Roff_MGSW1	397.6640	4.9708	48.0000	44.5597	12	37	0.7381	12	37	0.1121	983.1538	983.1344	.7385	.9836	
S_Link15	549.9294	6.8741	48.0000	128.8474	13	28	2.5319	13	28	0.2343	910.1491	893.2668	.5373	1.316	*
S_link16	539.1589	6.7395	48.0000	5.8138	18	34	0.8189	26	34	0.0108	912.4823	910.4239	.1206	.7310	
Runoff_S10	397.6640	4.9708	48.0000	254.0846	12	53	5.1969	12	53	0.6389	914.3705	912.5675	.8426	.6419	
Runoff_S11	397.6640	4.9708	48.0000	113.5647	12	47	4.7681	12	38	0.2856	918.6023	916.4024	.6506	.3506	
Roff_MGNE3	397.6640	4.9708	48.0000	156.1237	12	43	1.9515	12	43	0.3926	901.4944	901.3408	1.048	1.260	*
Roff_MGNE2	397.6640	4.9708	48.0000	88.8038	12	51	2.6146	1	17	0.2233	900.6903	900.6424	1.022	1.260	*
N_Link6	741.0031	9.2625	48.0000	238.7548	12	46	2.9844	12	46	0.3222	900.6424	900.6114	1.260	1.327	*
N_Link5	621.1634	7.7645	48.0000	237.9622	12	47	5.6906	12	35	0.3831	897.1644	893.9456	.6661	1.486	*
N_Link3	1899.861	6.3329	120.0000	900.3271	13	41	5.2976	13	36	0.4739	891.4467	876.2431	.7447	.7743	
N_Link7	1814.427	7.5601	72.0000	170.2051	12	51	2.9043	12	41	0.0938	896.1870	896.1841	.4312	.6973	
N_Link9	4565.759	10.1461	72.0000	767.0628	13	10	4.2742	13	8	0.1680	907.1792	896.2551	.3299	.5425	
N_Link8	1876.839	7.8202	72.0000	208.9347	12	39	3.2736	12	39	0.1113	900.3770	896.3675	.2295	.4046	
Runoff_N2	397.6640	4.9708	48.0000	338.5998	12	43	4.9102	12	33	0.8515	876.2513	876.2431	1.687	1.935	*
Runoff_N3	397.6640	4.9708	48.0000	198.7775	12	39	6.0822	12	39	0.4999	903.2079	900.3770	.8020	.3443	
Runoff_N8	397.6640	4.9708	48.0000	111.4087	13	28	3.6964	1	22	0.2802	896.2763	896.1841	.8191	1.046	*
Runoff_N5	397.6640	4.9708	48.0000	71.3445	13	7	2.6774	1	19	0.1794	912.3160	912.2839	1.279	1.521	*
NonameRd	330.4296	16.5215	48.0000	357.1906	12	48	19.9025	12	47	1.0810	948.8246	947.7128	1.456	1.678	
N_Link11.1	135.9893	11.3324	36.0000	311.6205	13	8	25.8656	13	8	2.2915	947.7128	944.0712	2.237	1.257	
N_Link11	6060.385	20.2013	120.0000	689.7125	13	7	11.5140	13	7	0.1138	944.0712	923.9910	.3771	.3191	
LacyRd_N3b	1010.039	34.2386	58.0000	120.6255	12	40	10.7939	15	47	0.1194	923.9910	920.8287	.6602	.9163	
LacyRd_N3a	99.7666	6.2729	54.0000	77.5903	12	40	7.9492	12	40	0.7777	920.8260	918.3615	.9836	.5692	
N_Link10	2664.101	8.8803	72.0000	697.4340	13	8	3.3948	13	8	0.2618	918.3615	912.2839	.4269	1.014	*
Runoff_N6	397.6640	4.9708	48.0000	61.9953	12	42	3.3742	12	35	0.1559	948.8336	948.8246	1.208	1.456	*
Roff_US_N1	397.6640	4.9708	48.0000	90.5861	12	35	3.9238	12	35	0.2278	1007.228	1005.570	.5570	.3925	
N_Link14	882.1389	11.0267	48.0000	83.2020	12	41	3.0874	12	37	0.0943	1001.922	980.6888	.3556	1.172	*
N_Link13	3166.249	7.2960	72.0000	1250.813	12	48	5.3823	12	42	0.3950	994.9215	980.6888	.8202	.7815	
Roff_MGNW1	397.6640	4.9708	48.0000	113.3439	12	43	3.4183	12	25	0.2850	1000.116	1000.001	.7789	1.000	*
Roff_US_N2	397.6640	4.9708	48.0000	123.5760	12	33	4.2748	12	33	0.3108	1025.528	1023.825	.6321	.4564	
N_Link16	842.9060	10.5363	48.0000	121.9441	12	36	6.0964	12	26	0.1447	1020.732	1000.001	.4329	1.000	*
Roff_MGN1	397.6640	4.9708	48.0000	191.4656	12	51	3.6847	12	38	0.4815	980.9066	980.6888	.9767	1.172	*
Roff_MGN2	397.6640	4.9708	48.0000	121.5550	12	45	3.8220	12	41	0.3057	944.1313	944.0712	.7078	.9428	
Runoff_N7	397.6640	4.9708	48.0000	25.2927	12	39	2.4659	12	35	0.0636	923.9951	923.9910	.5488	.7978	
N_Link12	5261.284	12.1236	72.0000	1586.960	12	51	8.5158	12	52	0.3016	980.6888	952.4091	.7815	.7432	
N_Link12.1	1336.358	4.1595	36.0000	1353.757	12	45	4.2137	12	45	1.0130	952.4091	948.8246	1.486	1.941	*

Runoff_N2.	397.6640	4.9708	48.0000	39.5740	12	30	2.5155	12	16	0.0995	891.4484	891.4467	1.612	1.861 *
Runoff_N1.	397.6640	4.9708	48.0000	28.2076	12	45	2.2473	12	30	0.0709	864.1806	864.1805	1.045	1.295 *
N_Link4	2433.847	8.1128	120.0000	881.7126	13	33	5.5694	13	12	0.3623	893.9603	891.4467	.6260	.7447
RR_br	3495.292	17.4765	120.0000	881.7717	13	32	7.2432	13	31	0.2523	893.9456	893.9603	.5946	.6260
USH14_NCul	480.7420	5.7231	72.0000	232.1550	13	49	2.7113	13	59	0.4829	876.2431	876.0956	1.340	1.349
LacyN1_Cul	1194.894	16.5957	72.0000	327.1072	16	7	4.5359	16	7	0.2738	875.9598	875.7782	1.360	1.546
280.1	172.5733	4.7937	72.0000	224.8120	12	33	7.4322	12	31	1.3027	874.5499	874.3706	1.925	1.978
Lacy_MCulv	919.4830	9.2877	66.0000	990.3374	14	34	9.9630	14	34	1.0771	872.4058	869.8222	1.982	1.604
284.1	2000.067	14.6525	78.0000	1060.434	14	40	8.9854	14	40	0.5302	864.1805	864.1569	.7970	.9472
USH14_SCul	293.0837	6.1059	72.0000	461.3046	13	28	9.2572	13	29	1.5740	877.9427	876.1880	1.607	1.364
EHill_Culv	255.7928	13.0274	60.0000	419.1547	12	47	22.0954	12	45	1.6386	948.6801	943.0210	1.736	1.084
SyeneS1Cul	125.3272	7.0806	45.0000	285.8803	12	42	16.1365	12	42	2.2811	925.5006	923.9669	1.946	1.671
Irish1Culv	83.8758	5.5917	36.0000	126.8928	12	44	8.1218	12	44	1.5129	921.8777	920.9439	2.292	2.114
Irish2Culv	33.9380	6.9138	30.0000	32.9932	12	41	7.9466	12	39	0.9722	983.1344	979.3556	1.573	.6222
Irish3Culv	92.2134	5.7633	24.0000	-131.199	13	54	-8.0514	13	51	-1.4228	987.3820	986.9178	3.191	3.308
RR_S3Culv	256.8162	17.1211	60.0000	44.5667	13	44	10.2767	13	25	0.1735	916.4024	912.4863	.2805	.4973
Irish0Culv	1.9395	0.0000	24.0000	40.8666	12	55	3.3112	12	54	21.0704	910.4239	910.1491	1.462	1.324
SyeneN1_Cu	45.5304	6.5043	31.0000	47.1520	12	24	6.7206	12	24	1.0356	901.3408	900.6424	1.951	1.951
LacyN2_Cul	41.4675	5.9239	31.0000	89.8176	12	36	13.2665	12	29	2.1660	900.6114	897.1644	2.056	1.031
SyeneN2_Cu	259.2403	7.8124	78.0000	178.1010	14	34	5.4929	14	37	0.6870	894.6518	893.9456	1.177	1.222
SyeneN1_C	253.8520	7.9329	48.0000	85.3005	12	50	5.3002	12	51	0.3360	896.3675	896.1870	.6069	.6442
JonesFrm_C	443.6945	13.8655	48.0000	310.3897	13	9	12.5356	13	7	0.6996	912.2839	907.1792	1.521	.4948
573.1	0.3439	1.7513	6.0000	2.3324	12	38	11.0644	12	38	6.7829	1000.001	994.9215	19.60	9.842
592.1	21.8107	12.3423	18.0000	42.4987	12	20	24.7251	12	18	1.9485	1022.495	1020.732	1.996	1.154
SwnCrNout	0.0000	0.0000	48.0000	19.0000	16	33	10.0000	16	33	0.0000	896.1841	896.1695	1.046	1.042
SwnCkSout	0.0000	0.0000	36.0000	7.0000	12	32	4.0000	12	32	0.0000	896.2551	896.1695	1.085	1.056
1.25in	0.0221	0.8025	1.2498	0.1173	12	27	12.2740	12	26	5.3160	1003.963	1001.922	33.25	13.75
3.25in	0.2405	0.8025	3.2497	0.7083	12	33	19.6520	12	29	2.9444	1003.963	1001.922	9.096	1.596
USH14_NOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
LacyN1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
PrivateDr	Undefnd	Undefnd	Undefn	955.5018	14	31								
Lacy_MOvr	Undefnd	Undefnd	Undefn	67.2007	14	38								
MM_ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
USH14_SOvr	Undefnd	Undefnd	Undefn	276.8439	13	49								
EHill_Ovr.1	Undefnd	Undefnd	Undefn	333.3273	12	55								
SyeneS1_Ovr	Undefnd	Undefnd	Undefn	576.5939	13	0								
irish1_Ovr.1	Undefnd	Undefnd	Undefn	639.7088	13	2								
Irish2Ovr	Undefnd	Undefnd	Undefn	74.4323	12	40								
Irish3Ovr	Undefnd	Undefnd	Undefn	275.5976	13	2								
RR_S3_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
irish0_Ovr.1	Undefnd	Undefnd	Undefn	71.0923	13	24								
SyeneN1_Ov	Undefnd	Undefnd	Undefn	128.2014	12	43								
LacyN2_Ovr	Undefnd	Undefnd	Undefn	152.3084	12	46								
SyeneN2_Ov	Undefnd	Undefnd	Undefn	518.5613	13	33								
SyeneN1_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
JonesFrm_O	Undefnd	Undefnd	Undefn	147.0375	13	9								
Lacy_N3_Ov.1	Undefnd	Undefnd	Undefn	473.3811	13	7								
StandPipe	Undefnd	Undefnd	Undefn	43.3559	12	39								
QuarryOvr	Undefnd	Undefnd	Undefn	41.0027	12	39								
Weir	Undefnd	Undefnd	Undefn	1543.295	12	39								
NobelWeir	Undefnd	Undefnd	Undefn	80.8061	12	34								
SwnCrWeirN	Undefnd	Undefnd	Undefn	176.5046	14	13								
SwanCkSout.1	Undefnd	Undefnd	Undefn	746.8802	13	8								
Weir10	Undefnd	Undefnd	Undefn	453.1182	13	34								
weir11	Undefnd	Undefnd	Undefn	25.9981	13	34								
weir14	Undefnd	Undefnd	Undefn	41.9187	13	34								
weirtop	Undefnd	Undefnd	Undefn	285.6500	13	34								
RR_S4out	Undefnd	Undefnd	Undefn	5.8147	18	28								
FREE # 1	Undefnd	Undefnd	Undefn	1060.434	14	41								

Table E12. Mean Conduit Flow Information								
Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
N_Link2	63.4619	10966224.	0.0004	0.9867	0.4482	1.2676	37.9263	0.0500
N_Link1	75.1707	12989494.	0.0009	0.9966	0.1921	1.6255	55.3191	0.0500
M_Link3	150.8851	26072951.	0.0009	0.9922	0.2116	1.9026	69.1961	0.0500
M_Link2	155.6756	26900747.	0.0009	0.9797	0.1972	1.9942	73.5716	0.0500
M_Link1	155.6175	26890705.	0.0009	0.9570	0.5413	1.4539	44.4273	0.0500
M_Link0	156.5708	27055432.	0.0008	0.9985	0.6935	1.1737	29.3045	0.0500
Runoff_N1	10.9921	1899437.6	0.0005	0.9880	0.1694	0.5687	16.5967	0.0500
Runoff_M2	4.7576	822108.29	0.0004	0.6074	0.0089	1.0304	32.3853	0.0500
S_Link5	9.7930	1692225.3	0.0006	0.9986	0.0751	0.6152	14.4624	0.0300
S_Link4	66.5152	11493833.	0.0017	0.9991	0.1561	0.7227	79.9777	0.0500
S_Link3	70.6311	12205056.	0.0016	0.9991	0.1670	0.8342	50.0234	0.0500
S_Link2	74.4857	12871136.	0.0014	0.9988	0.5255	0.8291	31.7292	0.0500

S_Link1	75.7389	13087678.	0.0011	0.9964	0.2391	1.3959	46.3487	0.0500
S_Link6	35.9541	6212860.4	0.0012	0.9991	0.1135	0.4447	26.9462	0.0500
Roff_MGNE1	1.6315	281925.63	0.0002	0.4415	0.0242	0.5757	16.3785	0.0500
Roff_MGE1	4.3271	747718.48	0.0005	0.7409	0.0139	1.1125	33.8350	0.0500
Roff_MGSE1	3.7046	640158.27	0.0003	0.6987	0.0262	0.8720	21.7861	0.0500
Runoff_S1	3.3634	581188.36	0.0004	0.6998	0.0057	1.1308	34.7714	0.0500
Runoff_S2	6.1839	1068576.2	0.0004	0.6983	0.0174	0.8661	21.8001	0.0500
Roff_MGSE2	7.7085	1332024.7	0.0004	0.9991	0.5862	0.2404	3.1766	0.0500
Runoff_S3	2.4168	417630.10	0.0002	0.5620	0.0712	0.5004	10.6401	0.0500
S_Link10	30.4034	5253715.9	0.0009	0.9960	0.3317	0.4950	9.3799	0.0500
S_Link9	33.5484	5797160.4	0.0012	0.9987	0.3855	0.5560	11.6682	0.0500
S_Link8	33.5502	5797466.1	0.0008	0.9962	0.9788	0.5972	12.8368	0.0500
S_Link7	33.5093	5790401.8	0.0010	0.9849	0.6438	0.6574	13.5605	0.0500
Runoff_S4	3.1364	541976.75	0.0002	0.9763	0.1509	0.2956	5.3828	0.0500
S_Link12	2.8269	488496.35	0.0002	0.8853	0.1701	0.1970	2.4700	0.0300
S_Link11	30.4175	5256146.7	0.0012	0.9991	0.6730	0.3782	6.7336	0.0300
S_Link14	20.0895	3471467.8	0.0005	0.9761	0.5008	0.3422	5.8585	0.0300
S_Link13	20.0665	3467484.1	0.0006	0.9748	0.5786	0.2931	4.3083	0.0300
Runoff_S6	4.9690	858638.98	0.0002	0.8462	0.1030	0.2899	5.0919	0.0500
Runoff_S5	7.4840	1293242.0	0.0002	0.9641	0.2223	0.2773	3.8500	0.0500
Runoff_S8	4.9861	861589.75	0.0003	0.9989	0.0413	0.5846	11.8159	0.0500
Runoff_S7	6.6219	1144269.1	0.0003	0.9976	0.0386	0.5776	11.7976	0.0500
Roff_MGSW2	3.4764	600727.07	0.0003	0.4263	0.0206	0.5740	11.7466	0.0500
Runoff_S9	1.7260	298248.82	0.0001	0.9724	0.1332	0.2164	3.5480	0.0500
Runoff_US1	2.0465	353639.29	0.0001	0.9991	0.6152	0.1359	1.3349	0.0500
Roff_MGSW1	1.0867	187779.35	0.0001	0.8916	0.0934	0.2065	3.4564	0.0500
S_Link15	10.6664	1843162.3	0.0002	0.8580	0.1229	0.6959	15.4820	0.0300
S_link16	1.7380	300323.37	0.0000	0.7658	0.1293	0.3867	5.0565	0.0300
Runoff_S10	8.9744	1550782.4	0.0003	0.9991	0.6030	0.2558	3.5697	0.0500
Runoff_S11	3.7925	655345.91	0.0001	0.9602	0.3208	0.1946	2.0160	0.0500
Roff_MGNE3	4.6017	795174.49	0.0002	0.9992	0.2414	0.2680	4.5741	0.0500
Roff_MGNE2	3.0281	523248.21	0.0001	0.6194	0.1944	0.2356	3.8272	0.0500
N_Link6	7.6279	1318106.3	0.0004	0.7868	0.3477	0.2848	4.9251	0.0300
N_Link5	7.6093	1314882.7	0.0004	0.9987	0.2198	0.3562	5.9324	0.0300
N_Link3	53.7941	9295620.4	0.0009	0.9991	0.3454	1.0892	27.2999	0.0500
N_Link7	5.3118	917883.69	0.0002	0.5821	0.0196	0.9315	41.1554	0.0300
N_Link9	33.2868	5751950.8	0.0012	0.9984	0.1437	0.7543	59.0445	0.0500
N_Link8	5.3183	919008.54	0.0003	0.8046	0.2666	0.2399	10.0839	0.0300
Runoff_N2	9.8961	1710044.5	0.0005	0.5895	0.1303	0.6632	18.3525	0.0500
Runoff_N3	5.3161	918625.95	0.0002	0.9991	0.4231	0.1833	2.2632	0.0500
Runoff_N8	6.6101	1142222.4	0.0002	0.7671	0.1667	0.7450	15.6962	0.0500
Runoff_N5	3.4049	588364.08	0.0002	0.9872	0.2077	0.2939	5.2866	0.0500
NonameRd	25.5245	4410625.4	0.0004	0.9987	1.7361	0.1907	1.4959	0.0140
N_Link11.1	25.5298	4411557.7	0.0003	0.9959	1.3136	0.2678	1.6633	0.0140
N_Link11	29.2198	5049175.0	0.0007	0.9991	0.9792	0.3644	5.6542	0.0500
LacyRd_N3b	18.5742	3209620.6	0.0003	0.9985	0.9526	0.3834	2.8598	0.0140
LacyRd_N3a	18.5717	3209195.3	0.0001	0.9985	1.1183	0.3457	1.7158	0.0140
N_Link10	29.8787	5163042.9	0.0011	0.9869	0.3347	0.3777	20.3391	0.0500
Runoff_N6	1.8323	316622.22	0.0001	0.9587	0.2805	0.1794	2.6273	0.0500
Roff_US_N1	2.3149	400006.35	0.0001	0.9992	0.5686	0.1541	1.3876	0.0500
N_Link14	2.1443	370543.63	0.0000	0.9952	0.1942	0.2946	3.6367	0.0300
N_Link13	11.5284	1992109.8	0.0050	0.9933	0.3723	0.3370	5.2813	0.0500
Roff_MGNW1	3.1148	538231.47	0.0002	0.9989	0.6042	0.2047	3.4417	0.0500
Roff_US_N2	3.2229	556916.74	0.0001	0.9992	0.5658	0.1770	1.7211	0.0500
N_Link16	3.1864	550617.44	0.0001	0.9991	1.1258	0.1803	2.5079	0.0300
Roff_MGN1	5.9653	1030808.7	0.0002	0.8908	0.1203	0.3390	4.7253	0.0500
Roff_MGN2	3.6891	637479.02	0.0002	0.9730	0.1551	0.2629	3.5326	0.0500
Runoff_N7	0.6617	114344.41	0.0001	0.9589	0.0965	0.1915	2.5354	0.0500
N_Link12	19.6760	3400017.0	0.0013	0.9849	0.6147	0.3304	4.8979	0.0500
N_Link12.1	23.7102	4097123.0	0.0015	0.9992	0.5347	0.2076	15.7447	0.0500
Runoff_N2.	1.0214	176489.89	0.0003	0.5620	0.0583	0.5463	11.2218	0.0500
Runoff_N1.	0.9558	165161.06	0.0001	0.9427	0.0883	0.5542	15.0946	0.0500
N_Link4	52.6837	9103736.5	0.0034	0.9823	0.3362	0.9199	19.0414	0.0500
RR_br	52.6851	9103992.3	0.0122	0.9823	0.4823	0.7997	19.6553	0.0300
USH14_NCul	63.4768	10968791.	0.0002	0.9960	0.1108	1.1915	28.1643	0.0140
LacyN1_Cul	75.1734	12989956.	0.0005	0.9984	0.4170	0.8502	19.9466	0.0140
280.1	46.0533	7958002.4	0.0003	0.9829	0.3325	1.0901	16.4177	0.0500
Lacy_MCulv	153.6444	26549751.	0.0008	0.9638	0.2531	1.4267	43.2035	0.0240
284.1	156.5740	27055981.	0.0009	0.9988	0.6768	1.1681	33.0051	0.0240
USH14_SCul	71.2545	12312780.	0.0004	0.9986	0.4833	0.6975	11.7701	0.0140
EHill_Culv	26.6193	4599809.1	0.0004	0.9981	1.8919	0.3729	2.4995	0.0240
SyeneS1Cul	24.2037	4182399.4	0.0003	0.9965	0.9999	0.4384	3.6919	0.0240
Irish1Culv	22.3445	3861121.8	0.0002	0.9874	1.1193	0.3758	3.3434	0.0240
Irish2Culv	2.0583	355682.11	0.0000	0.5557	0.7795	0.1518	0.5156	0.0240
Irish3Culv	-10.6504	-1840387.	0.0002	0.9762	0.0000	0.5741	7.3255	0.0240
RR_S3Culv	3.7908	655052.64	0.0000	0.9984	0.6095	0.4266	2.8745	0.0240
Irish0Culv	9.2232	1593775.7	0.0000	0.9991	0.1082	0.6400	5.7180	0.0240
SyeneN1_Cu	3.1150	538280.61	0.0001	0.6668	0.5770	0.2340	1.0809	0.0240
LacyN2_Cul	6.0367	1043147.1	0.0001	0.6758	0.6600	0.2514	1.0998	0.0240
SyeneN2_Cu	33.2928	5752988.1	0.0005	0.9952	0.1351	1.1561	10.7456	0.0240

SyeneN1_C	5.3072	917086.07	0.0001	0.9613	0.7383	0.3649	3.8324	0.0140
JonesFrm_C	31.6039	5461161.8	0.0001	0.9991	1.4313	0.2691	3.0303	0.0140
573.1	1.2036	207977.09	0.0000	0.9951	1.5626	0.1264	0.1895	0.0300
592.1	2.4914	430511.45	0.0000	0.8488	2.6843	0.1255	0.2330	0.0140
SwnCrNout	6.1854	1068841.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	3.5176	607843.74	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	0.0747	12912.840	0.0000	0.9987	5.2008	0.0262	0.0082	0.0009
3.25in	0.2533	43778.791	0.0000	0.8834	1.8175	0.0609	0.0499	0.0018
USH14_NOvr	0.0000	0.0000						
LacyN1_Ovr	0.0000	0.0000						
PrivateDr	109.6000	18938884.						
Lacy_MOvr	1.9962	344939.15						
MM_ovr	0.0000	0.0000						
USH14_SOvr	4.4906	775968.20						
EHill_Ovr.1	3.7724	651873.13						
SyeneS1_Ovr	9.3397	1613899.6						
irish1_Ovr.1	11.2041	1936071.3						
Irish2Ovr	0.7559	130617.91						
Irish3Ovr	4.4393	767116.22						
RR_S3_Ovr	0.0000	0.0000						
irish0_Ovr.1	1.5125	261365.11						
SyeneN1_Ov	1.4878	257088.20						
LacyN2_Ovr	1.5919	275078.85						
SyeneN2_Ov	11.7576	2031720.8						
SyeneN1_Ov.1	0.0000	0.0000						
JonesFrm_O	1.6900	292027.13						
Lacy_N3_Ov.1	11.3039	1953319.7						
StandPipe	1.5242	263375.18						
QuarryOvr	0.2795	48295.958						
Weir	6.8746	1187927.6						
NobelWeir	0.7321	126513.50						
SwnCrWeirN	5.6662	979111.38						
SwanCkSout.1	29.4175	5083344.5						
Weir10	36.4613	6300504.9						
weir11	0.9423	162830.49						
weir14	1.2083	208787.51						
weirtop	6.4390	1112667.3						
RR_S4out	1.7438	301326.79						
FREE # 1	156.5709	27055444.						

Selected XP-SWMM Output, Post-development Conditions, 2-year event
Expanded model for resource impact analysis

```
*=========================================================*
 |         RUNOFF TABLES IN THE OUTPUT FILE.               |
 |  These are the more important tables in the output file. |
 |  You can use your editor to find the table numbers,      |
 |  for example: search for Table R3 to check continuity.   |
 |  This output file can be imported into a Word Processor  |
 |  and printed on US letter or A4 paper using portrait     |
 |  mode, courier font, a size of 8 pt. and margins of 0.75 |
 |                                                          |
 | Table R1  - Physical Hydrology Data                      |
 | Table R2  - Infiltration data                            |
 | Table R3  - Raingage and Infiltration Database Names     |
 | Table R4  - Groundwater Data                             |
 | Table R5  - Continuity Check for Surface Water           |
 | Table R6  - Continuity Check for Channels/Pipes          |
 | Table R7  - Continuity Check for Subsurface Water        |
 | Table R8  - Infiltration/Inflow Continuity Check         |
 | Table R9  - Summary Statistics for Subcatchments         |
 | Table R10 - Sensitivity anlysis for Subcatchments        |
 *=========================================================*

#######################################
# Rainfall input summary from Runoff #
#######################################

 Total rainfall for gage #     1 is    2.9000 inches


  ###################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A    #
  #            Physical Hydrology Data              #
  ###################################################
```

Number	Subcatchment Name	Channel or inlet	Width (ft)	Area (ac)	Per-cent Imperv	Slope ft/ft	"n" Imprv	"n" Perv	Deprs-sion Storge Imprv	Deprs-sion Strge Perv	Prcnt Zero Deten-tion
1	D-S_N2.1#1	D-S_N2.1	1.0000	6.6450	100.00	0.100	0.020	0.020	0.000	0.000	0.00
2	D-S_N2.1#2	D-S_N2.1	1.0000	4.4280	0.00	0.100	0.020	0.020	0.000	0.000	0.00
3	McGaw_NE2#1	McGaw_NE2	1.0000	35.110	100.00	0.100	0.020	0.020	0.000	0.000	0.00
4	McGaw_NE2#2	McGaw_NE2	1.0000	11.150	0.00	0.100	0.020	0.020	0.000	0.000	0.00
5	McGaw_NE3#1	McGaw_NE3	1.0000	42.330	100.00	0.100	0.020	0.020	0.000	0.000	0.00
6	McGaw_NE3#2	McGaw_NE3	1.0000	37.320	0.00	0.100	0.020	0.020	0.000	0.000	0.00
7	D-S_N3#1	D-S_N3	1.0000	.87800	100.00	0.100	0.020	0.020	0.000	0.000	0.00
8	D-S_N3#2	D-S_N3	1.0000	93.323	0.00	0.100	0.020	0.020	0.000	0.000	0.00
9	D-S_N8#1	D-S_N8	1.0000	26.853	100.00	0.100	0.020	0.020	0.000	0.000	0.00
10	D-S_N8#2	D-S_N8	1.0000	84.947	0.00	0.100	0.020	0.020	0.000	0.000	0.00
11	D-S_N5#1	D-S_N5	1.0000	17.008	100.00	0.100	0.020	0.020	0.000	0.000	0.00
12	D-S_N5#2	D-S_N5	1.0000	33.566	0.00	0.100	0.020	0.020	0.000	0.000	0.00
13	D-S_N6#1	D-S_N6	1.0000	5.4890	100.00	0.100	0.020	0.020	0.000	0.000	0.00
14	D-S_N6#2	D-S_N6	1.0000	22.966	0.00	0.100	0.020	0.020	0.000	0.000	0.00
15	U-S_N1#1	U-S_N1	1.0000	11.077	100.00	0.100	0.020	0.020	0.000	0.000	0.00
16	U-S_N1#2	U-S_N1	1.0000	23.505	0.00	0.100	0.020	0.020	0.000	0.000	0.00
17	U-S_N2#1	U-S_N2	1.0000	21.839	100.00	0.100	0.020	0.020	0.000	0.000	0.00
18	U-S_N2#2	U-S_N2	1.0000	13.756	0.00	0.100	0.020	0.020	0.000	0.000	0.00
19	McGaw_NW1#1	McGaw_NW1	1.0000	44.950	100.00	0.100	0.020	0.020	0.000	0.000	0.00
20	McGaw_NW1#2	McGaw_NW1	1.0000	6.1000	0.00	0.100	0.020	0.020	0.000	0.000	0.00
21	D-S_N6.1#1	D-S_N6.1	1.0000	16.539	100.00	0.100	0.020	0.020	0.000	0.000	0.00
22	D-S_N6.1#2	D-S_N6.1	1.0000	46.470	0.00	0.100	0.020	0.020	0.000	0.000	0.00
23	McGaw_N1#1	McGaw_N1	1.0000	65.180	100.00	0.100	0.020	0.020	0.000	0.000	0.00
24	McGaw_N1#2	McGaw_N1	1.0000	32.310	0.00	0.100	0.020	0.020	0.000	0.000	0.00
25	McGaw_N2#1	McGaw_N2	1.0000	27.940	100.00	0.100	0.020	0.020	0.000	0.000	0.00
26	McGaw_N2#2	McGaw_N2	1.0000	33.510	0.00	0.100	0.020	0.020	0.000	0.000	0.00
27	D-S_N7#1	D-S_N7	1.0000	.54400	100.00	0.100	0.020	0.020	0.000	0.000	0.00
28	D-S_N7#2	D-S_N7	1.0000	14.638	0.00	0.100	0.020	0.020	0.000	0.000	0.00
29	D-S_N2#1	D-S_N2	1.0000	.55000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
30	D-S_N2#2	D-S_N2	1.0000	200.61	0.00	0.100	0.020	0.020	0.000	0.000	0.00
31	D-S_N1#1	D-S_N1	1.0000	1.0930	100.00	0.100	0.020	0.020	0.000	0.000	0.00
32	D-S_N1#2	D-S_N1	1.0000	184.35	0.00	0.100	0.020	0.020	0.000	0.000	0.00
33	U-S_S1#1	U-S_S1	1.0000	.76000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
34	U-S_S1#2	U-S_S1	1.0000	35.852	0.00	0.100	0.020	0.020	0.000	0.000	0.00
35	McGaw_SE2#1	McGaw_SE2	1.0000	51.900	100.00	0.100	0.020	0.020	0.000	0.000	0.00
36	McGaw_SE2#2	McGaw_SE2	1.0000	87.780	0.00	0.100	0.020	0.020	0.000	0.000	0.00
37	D-S_S3#1	D-S_S3	1.0000	4.7330	100.00	0.100	0.020	0.020	0.000	0.000	0.00

38	D-S_S3#2	D-S_S3	1.0000	44.038	0.00	0.100	0.020	0.020	0.000	0.000	0.00
39	D-S_S9#1	D-S_S9	1.0000	.40000E-02	100.00	0.100	0.020	0.020	0.000	0.000	0.00
40	D-S_S9#2	D-S_S9	1.0000	28.234	0.00	0.100	0.020	0.020	0.000	0.000	0.00
41	McGaw_SW1#1	McGaw_SW1	1.0000	9.2200	100.00	0.100	0.020	0.020	0.000	0.000	0.00
42	McGaw_SW1#2	McGaw_SW1	1.0000	7.9000	0.00	0.100	0.020	0.020	0.000	0.000	0.00
43	D-S_S6#2	D-S_S6	1.0000	84.152	0.00	0.100	0.020	0.020	0.000	0.000	0.00
44	D-S_S8#1	D-S_S8	1.0000	5.1180	100.00	0.100	0.020	0.020	0.000	0.000	0.00
45	D-S_S8#2	D-S_S8	1.0000	86.827	0.00	0.100	0.020	0.020	0.000	0.000	0.00
46	D-S_S7#1	D-S_S7	1.0000	.49000E-01	100.00	0.100	0.020	0.020	0.000	0.000	0.00
47	D-S_S7#2	D-S_S7	1.0000	110.86	0.00	0.100	0.020	0.020	0.000	0.000	0.00
48	McGaw_SW2#1	McGaw_SW2	1.0000	41.120	100.00	0.100	0.020	0.020	0.000	0.000	0.00
49	McGaw_SW2#2	McGaw_SW2	1.0000	18.320	0.00	0.100	0.020	0.020	0.000	0.000	0.00
50	D-S_S5#1	D-S_S5	1.0000	7.7740	100.00	0.100	0.020	0.020	0.000	0.000	0.00
51	D-S_S5#2	D-S_S5	1.0000	118.68	0.00	0.100	0.020	0.020	0.000	0.000	0.00
52	D-S_S4#1	D-S_S4	1.0000	7.7820	100.00	0.100	0.020	0.020	0.000	0.000	0.00
53	D-S_S4#2	D-S_S4	1.0000	52.111	0.00	0.100	0.020	0.020	0.000	0.000	0.00
54	D-S_S2#1	D-S_S2	1.0000	.12400	100.00	0.100	0.020	0.020	0.000	0.000	0.00
55	D-S_S2#2	D-S_S2	1.0000	103.74	0.00	0.100	0.020	0.020	0.000	0.000	0.00
56	D-S_S11#1	D-S_S11	1.0000	11.711	100.00	0.100	0.020	0.020	0.000	0.000	0.00
57	D-S_S11#2	D-S_S11	1.0000	51.900	0.00	0.100	0.020	0.020	0.000	0.000	0.00
58	D-S_S10#1	D-S_S10	1.0000	1.7440	100.00	0.100	0.020	0.020	0.000	0.000	0.00
59	D-S_S10#2	D-S_S10	1.0000	153.67	0.00	0.100	0.020	0.020	0.000	0.000	0.00
60	McGaw_SE1#1	McGaw_SE1	1.0000	11.930	100.00	0.100	0.020	0.020	0.000	0.000	0.00
61	McGaw_SE1#2	McGaw_SE1	1.0000	46.240	0.00	0.100	0.020	0.020	0.000	0.000	0.00
62	McGaw_E1#1	McGaw_E1	1.0000	32.820	100.00	0.100	0.020	0.020	0.000	0.000	0.00
63	McGaw_E1#2	McGaw_E1	1.0000	34.680	0.00	0.100	0.020	0.020	0.000	0.000	0.00
64	D-S_S1#2	D-S_S1	1.0000	57.900	0.00	0.100	0.020	0.020	0.000	0.000	0.00
65	McGaw_NE1#1	McGaw_NE1	1.0000	17.100	100.00	0.100	0.020	0.020	0.000	0.000	0.00
66	McGaw_NE1#2	McGaw_NE1	1.0000	9.2400	0.00	0.100	0.020	0.020	0.000	0.000	0.00
67	D-S_M2#2	D-S_M2	1.0000	85.039	0.00	0.100	0.020	0.020	0.000	0.000	0.00
68	D-S_N1.1#1	D-S_N1.1	1.0000	2.4700	100.00	0.100	0.020	0.020	0.000	0.000	0.00
69	D-S_N1.1#2	D-S_N1.1	1.0000	13.362	0.00	0.100	0.020	0.020	0.000	0.000	0.00

```
##########################################################################################################
#          Table R2.  SUBCATCHMENT  DATA                                                                  #
#                     Infiltration or Time of Concentration Data                                         #
#                                                                                                        #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)              Infl #4(#8)  #
# SCS                 ->   Comp CN          Time Conc         Shape Factor        Depth or Fraction  #
# SBUH                ->   Comp CN          Time Conc                 N/A                      N/A  #
# Green Ampt          ->   Suction          Hydr Cond          Initial MD                      N/A  #
# Horton              ->  Max Rate           Min Rate   Decay Rate (1/sec)      Max. Infilt. Volume  #
# Proportional        ->  Constant                N/A                 N/A                      N/A  #
# Initial/Cont Loss   ->   Initial         Continuing                 N/A                      N/A  #
# Initial/Proportional ->  Initial           Constant                 N/A                      N/A  #
# Laurenson Parameters ->  B Value       Pervious "n"      Impervious Cont                 Exponent  #
# Rational Formula    -> Tc Method   Flow Path Length      Flow Path Slope  Roughness or Retardance  #
#                              (#1 - #4 is Impervious Data / #5 - #8 is Pervious Data)                   #
#                     Rational Formula Tc Method: 1 = Constant                                           #
#                                                 2 = Friend's Equation                                  #
#                                                 3 = Kinematic Wave                                     #
#                                                 4 = Alameda Method                                     #
#                                                 5 = Izzard's Formula                                   #
#                                                 6 = Kerby's Equation                                   #
#                                                 7 = Kirpich's Equation                                 #
#                                                 8 = Bransby Williams Equation                          #
#                                                 9 = Federal Aviation Authority Equation                #
##########################################################################################################
```

Subcatchment Number	Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	D-S_N2.1#1	98.0000	0.2000	484.0000	0.2000				
2	D-S_N2.1#2	64.0000	0.2000	484.0000	0.2000				
3	McGaw_NE2#1	98.0000	0.3333	484.0000	0.2000				
4	McGaw_NE2#2	61.0000	0.3333	484.0000	0.2000				
5	McGaw_NE3#1	98.0000	0.2417	484.0000	0.2000				
6	McGaw_NE3#2	61.0000	0.2417	484.0000	0.2000				
7	D-S_N3#1	98.0000	0.4333	484.0000	0.2000				
8	D-S_N3#2	68.3000	0.4333	484.0000	0.2000				
9	D-S_N8#1	98.0000	1.4333	484.0000	0.2000				
10	D-S_N8#2	59.3000	1.4333	484.0000	0.2000				
11	D-S_N5#1	98.0000	1.0500	484.0000	0.2000				
12	D-S_N5#2	59.5000	1.0500	484.0000	0.2000				
13	D-S_N6#1	98.0000	0.4833	484.0000	0.2000				
14	D-S_N6#2	65.6000	0.4833	484.0000	0.2000				
15	U-S_N1#1	98.0000	0.2667	484.0000	0.2000				
16	U-S_N1#2	60.4000	0.2667	484.0000	0.2000				
17	U-S_N2#1	98.0000	0.2333	484.0000	0.2000				
18	U-S_N2#2	60.9000	0.2333	484.0000	0.2000				

19	McGaw_NW1#1	98.0000	0.2333	484.0000	0.2000
20	McGaw_NW1#2	61.0000	0.2333	484.0000	0.2000
21	D-S_N6.1#1	98.0000	0.4333	484.0000	0.2000
22	D-S_N6.1#2	60.8000	0.4333	484.0000	0.2000
23	McGaw_N1#1	98.0000	0.3167	484.0000	0.2000
24	McGaw_N1#2	61.0000	0.3167	484.0000	0.2000
25	McGaw_N2#1	98.0000	0.2750	484.0000	0.2000
26	McGaw_N2#2	61.0000	0.2750	484.0000	0.2000
27	D-S_N7#1	98.0000	0.3667	484.0000	0.2000
28	D-S_N7#2	60.1000	0.3667	484.0000	0.2000
29	D-S_N2#1	98.0000	0.5000	484.0000	0.2000
30	D-S_N2#2	64.8000	0.5000	484.0000	0.2000
31	D-S_N1#1	98.0000	0.9167	484.0000	0.2000
32	D-S_N1#2	69.8000	0.9167	484.0000	0.2000
33	U-S_S1#1	98.0000	0.3000	484.0000	0.2000
34	U-S_S1#2	68.8000	0.3000	484.0000	0.2000
35	McGaw_SE2#1	98.0000	0.2250	484.0000	0.2000
36	McGaw_SE2#2	61.0000	0.2250	484.0000	0.2000
37	D-S_S3#1	98.0000	0.4500	484.0000	0.2000
38	D-S_S3#2	60.7000	0.4500	484.0000	0.2000
39	D-S_S9#1	98.0000	0.4333	484.0000	0.2000
40	D-S_S9#2	71.0000	0.4333	484.0000	0.2000
41	McGaw_SW1#1	98.0000	0.1667	484.0000	0.2000
42	McGaw_SW1#2	61.0000	0.1667	484.0000	0.2000
43	D-S_S6#2	69.9000	0.6000	484.0000	0.2000
44	D-S_S8#1	98.0000	1.0167	484.0000	0.2000
45	D-S_S8#2	65.3000	1.0167	484.0000	0.2000
46	D-S_S7#1	98.0000	0.8000	484.0000	0.2000
47	D-S_S7#2	70.2000	0.8000	484.0000	0.2000
48	McGaw_SW2#1	98.0000	0.1750	484.0000	0.2000
49	McGaw_SW2#2	61.0000	0.1750	484.0000	0.2000
50	D-S_S5#1	98.0000	0.6833	484.0000	0.2000
51	D-S_S5#2	67.9000	0.6833	484.0000	0.2000
52	D-S_S4#1	98.0000	0.9500	484.0000	0.2000
53	D-S_S4#2	60.8000	0.9500	484.0000	0.2000
54	D-S_S2#1	98.0000	0.5000	484.0000	0.2000
55	D-S_S2#2	70.1000	0.5000	484.0000	0.2000
56	D-S_S11#1	98.0000	0.6000	484.0000	0.2000
57	D-S_S11#2	62.8000	0.6000	484.0000	0.2000
58	D-S_S10#1	98.0000	0.7333	484.0000	0.2000
59	D-S_S10#2	68.9000	0.7333	484.0000	0.2000
60	McGaw_SE1#1	98.0000	0.5167	484.0000	0.2000
61	McGaw_SE1#2	67.0000	0.5167	484.0000	0.2000
62	McGaw_E1#1	98.0000	0.2333	484.0000	0.2000
63	McGaw_E1#2	61.0000	0.2333	484.0000	0.2000
64	D-S_S1#2	69.5000	0.3667	484.0000	0.2000
65	McGaw_NE1#1	98.0000	0.1833	484.0000	0.2000
66	McGaw_NE1#2	61.0000	0.1833	484.0000	0.2000
67	D-S_M2#2	68.3000	0.5500	484.0000	0.2000
68	D-S_N1.1#1	98.0000	0.5500	484.0000	0.2000
69	D-S_N1.1#2	64.6000	0.5500	484.0000	0.2000

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Number	Subcatchment Name	Gage No	Infiltration Type	Routing Type	Rainfall Database Name	Infiltration Database Name
1	D-S_N2.1#1	1	SCS Method	SCS curvilinear		
2	D-S_N2.1#2	1	SCS Method	SCS curvilinear		
3	McGaw_NE2#1	1	SCS Method	SCS curvilinear		
4	McGaw_NE2#2	1	SCS Method	SCS curvilinear		
5	McGaw_NE3#1	1	SCS Method	SCS curvilinear		
6	McGaw_NE3#2	1	SCS Method	SCS curvilinear		
7	D-S_N3#1	1	SCS Method	SCS curvilinear		
8	D-S_N3#2	1	SCS Method	SCS curvilinear		
9	D-S_N8#1	1	SCS Method	SCS curvilinear		
10	D-S_N8#2	1	SCS Method	SCS curvilinear		
11	D-S_N5#1	1	SCS Method	SCS curvilinear		
12	D-S_N5#2	1	SCS Method	SCS curvilinear		
13	D-S_N6#1	1	SCS Method	SCS curvilinear		
14	D-S_N6#2	1	SCS Method	SCS curvilinear		
15	U-S_N1#1	1	SCS Method	SCS curvilinear		
16	U-S_N1#2	1	SCS Method	SCS curvilinear		
17	U-S_N2#1	1	SCS Method	SCS curvilinear		
18	U-S_N2#2	1	SCS Method	SCS curvilinear		
19	McGaw_NW1#1	1	SCS Method	SCS curvilinear		
20	McGaw_NW1#2	1	SCS Method	SCS curvilinear		

21	D-S_N6.1#1	1	SCS Method	SCS curvilinear
22	D-S_N6.1#2	1	SCS Method	SCS curvilinear
23	McGaw_N1#1	1	SCS Method	SCS curvilinear
24	McGaw_N1#2	1	SCS Method	SCS curvilinear
25	McGaw_N2#1	1	SCS Method	SCS curvilinear
26	McGaw_N2#2	1	SCS Method	SCS curvilinear
27	D-S_N7#1	1	SCS Method	SCS curvilinear
28	D-S_N7#2	1	SCS Method	SCS curvilinear
29	D-S_N2#1	1	SCS Method	SCS curvilinear
30	D-S_N2#2	1	SCS Method	SCS curvilinear
31	D-S_N1#1	1	SCS Method	SCS curvilinear
32	D-S_N1#2	1	SCS Method	SCS curvilinear
33	U-S_S1#1	1	SCS Method	SCS curvilinear
34	U-S_S1#2	1	SCS Method	SCS curvilinear
35	McGaw_SE2#1	1	SCS Method	SCS curvilinear
36	McGaw_SE2#2	1	SCS Method	SCS curvilinear
37	D-S_S3#1	1	SCS Method	SCS curvilinear
38	D-S_S3#2	1	SCS Method	SCS curvilinear
39	D-S_S9#1	1	SCS Method	SCS curvilinear
40	D-S_S9#2	1	SCS Method	SCS curvilinear
41	McGaw_SW1#1	1	SCS Method	SCS curvilinear
42	McGaw_SW1#2	1	SCS Method	SCS curvilinear
43	D-S_S6#2	1	SCS Method	SCS curvilinear
44	D-S_S8#1	1	SCS Method	SCS curvilinear
45	D-S_S8#2	1	SCS Method	SCS curvilinear
46	D-S_S7#1	1	SCS Method	SCS curvilinear
47	D-S_S7#2	1	SCS Method	SCS curvilinear
48	McGaw_SW2#1	1	SCS Method	SCS curvilinear
49	McGaw_SW2#2	1	SCS Method	SCS curvilinear
50	D-S_S5#1	1	SCS Method	SCS curvilinear
51	D-S_S5#2	1	SCS Method	SCS curvilinear
52	D-S_S4#1	1	SCS Method	SCS curvilinear
53	D-S_S4#2	1	SCS Method	SCS curvilinear
54	D-S_S2#1	1	SCS Method	SCS curvilinear
55	D-S_S2#2	1	SCS Method	SCS curvilinear
56	D-S_S11#1	1	SCS Method	SCS curvilinear
57	D-S_S11#2	1	SCS Method	SCS curvilinear
58	D-S_S10#1	1	SCS Method	SCS curvilinear
59	D-S_S10#2	1	SCS Method	SCS curvilinear
60	McGaw_SE1#1	1	SCS Method	SCS curvilinear
61	McGaw_SE1#2	1	SCS Method	SCS curvilinear
62	McGaw_E1#1	1	SCS Method	SCS curvilinear
63	McGaw_E1#2	1	SCS Method	SCS curvilinear
64	D-S_S1#2	1	SCS Method	SCS curvilinear
65	McGaw_NE1#1	1	SCS Method	SCS curvilinear
66	McGaw_NE1#2	1	SCS Method	SCS curvilinear
67	D-S_M2#2	1	SCS Method	SCS curvilinear
68	D-S_N1.1#1	1	SCS Method	SCS curvilinear
69	D-S_N1.1#2	1	SCS Method	SCS curvilinear

Total Number of Subcatchments...	69
Total Tributary Area (acres)....	2602.67
Impervious Area (acres).....	529.21
Pervious Area (acres).....	2073.47
Total Width (feet).....	69.00
Percent Imperviousness.....	20.33

##
Table R9. Summary Statistics for Subcatchments
##

Note: Total Runoff Depth includes pervious & impervious area
Pervious and Impervious Runoff Depth is only the runoff from those two areas.

Subcatchment.....	D-S_N2.1#1	D-S_N2.1#2	McGaw_NE2#1	McGaw_NE2#2	McGaw_NE3#1	McGaw_NE3#2
Area (acres).....	6.64500	4.42800	35.11000	11.15000	42.33000	37.32000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in).....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.00000	0.42744	0.00000	0.32970	0.00000	0.33890
Total Losses (in).....	0.00000	2.47256	0.00000	2.57030	0.00000	2.56110
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	1.57067	0.00000	2.04612	0.00000	8.34282
Total Impervious Area						

Total Runoff Depth (in)	2.67921	0.00000	2.68276	0.00000	2.75762	0.00000
Peak Runoff Rate (cfs).	14.54167	0.00000	72.45226	0.00000	94.20352	0.00000

Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67921	0.42744	2.68276	0.32970	2.75762	0.33890
Peak Runoff Rate (cfs).	14.54167	1.57067	72.45226	2.04612	94.20352	8.34282
Unit Runoff (in/hr)....	2.18836	0.35471	2.06358	0.18351	2.22546	0.22355
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N3#1	D-S_N3#2	D-S_N8#1	D-S_N8#2	D-S_N5#1	D-S_N5#2
Area (acres).....	0.87800	93.32300	26.85300	84.94700	17.00800	33.56600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.58985	0.00000	0.27941	0.00000	0.28532
Total Losses (in).....	0.00000	2.31015	0.00000	2.62059	0.00000	2.61468
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	36.09235	0.00000	5.15544	0.00000	2.48511
Total Impervious Area						
Total Runoff Depth (in)	2.67755	0.00000	2.68213	0.00000	2.68405	0.00000
Peak Runoff Rate (cfs).	1.68568	0.00000	26.75893	0.00000	20.93770	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67755	0.58985	2.68213	0.27941	2.68405	0.28532
Peak Runoff Rate (cfs).	1.68568	36.09235	26.75893	5.15544	20.93770	2.48511
Unit Runoff (in/hr)....	1.91991	0.38675	0.99650	0.06069	1.23105	0.07404
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N6#1	D-S_N6#2	U-S_N1#1	U-S_N1#2	U-S_N2#1	U-S_N2#2
Area (acres).....	5.48900	22.96600	11.07700	23.50500	21.83900	13.75600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.48458	0.00000	0.31101	0.00000	0.32510
Total Losses (in).....	0.00000	2.41542	0.00000	2.58899	0.00000	2.57490
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	6.25495	0.00000	4.44382	0.00000	3.00070
Total Impervious Area						

Total Runoff Depth (in)	2.67736	0.00000	2.67833	0.00000	2.67013	0.00000
Peak Runoff Rate (cfs).	10.12109	0.00000	23.69709	0.00000	47.18007	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67736	0.48458	2.67833	0.31101	2.67013	0.32510
Peak Runoff Rate (cfs).	10.12109	6.25495	23.69709	4.44382	47.18007	3.00070
Unit Runoff (in/hr)....	1.84389	0.27236	2.13931	0.18906	2.16036	0.21814
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NW1#1	McGaw_NW1#2	D-S_N6.1#1	D-S_N6.1#2	McGaw_N1#1	McGaw_N1#2
Area (acres).....	44.95000	6.10000	16.53900	46.47000	65.18000	32.31000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.32815	0.00000	0.32296	0.00000	0.32911
Total Losses (in).....	0.00000	2.57185	0.00000	2.57704	0.00000	2.57089
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	1.35130	0.00000	6.96958	0.00000	6.08142
Total Impervious Area						
Total Runoff Depth (in)	2.67013	0.00000	2.67755	0.00000	2.67792	0.00000
Peak Runoff Rate (cfs).	97.10812	0.00000	31.75334	0.00000	135.33525	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.67013	0.32815	2.67755	0.32296	2.67792	0.32911
Peak Runoff Rate (cfs).	97.10812	1.35130	31.75334	6.96958	135.33525	6.08142
Unit Runoff (in/hr)....	2.16036	0.22153	1.91991	0.14998	2.07633	0.18822
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#1	McGaw_N2#2	D-S_N7#1	D-S_N7#2	D-S_N2#1	D-S_N2#2
Area (acres).....	27.94000	33.51000	0.54400	14.63800	0.05500	200.61100
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.33138	0.00000	0.30175	0.00000	0.45656
Total Losses (in).....	0.00000	2.56862	0.00000	2.59825	0.00000	2.44344
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	6.92457	0.00000	2.16174	0.00000	48.81502

Total Impervious Area						
Total Runoff Depth (in)	2.69636	0.00000	2.67502	0.00000	2.68411	0.00000
Peak Runoff Rate (cfs).	59.92114	0.00000	1.09328	0.00000	0.10082	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.69636	0.33138	2.67502	0.30175	2.68411	0.45656
Peak Runoff Rate (cfs).	59.92114	6.92457	1.09328	2.16174	0.10082	48.81502
Unit Runoff (in/hr)....	2.14464	0.20664	2.00971	0.14768	1.83302	0.24333
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N1#1	D-S_N1#2	U-S_S1#1	U-S_S1#2	McGaw_SE2#1	McGaw_SE2#2
Area (acres).....	1.09300	184.35100	0.07600	35.85200	51.90000	87.78000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.65472	0.00000	0.61195	0.00000	0.32751
Total Losses (in).....	0.00000	2.24528	0.00000	2.28805	0.00000	2.57249
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	51.61681	0.00000	17.48100	0.00000	19.83146
Total Impervious Area						
Total Runoff Depth (in)	2.68482	0.00000	2.68388	0.00000	2.66492	0.00000
Peak Runoff Rate (cfs).	1.46876	0.00000	0.15988	0.00000	112.18135	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	2.68482	0.65472	2.68388	0.61195	2.66492	0.32751
Peak Runoff Rate (cfs).	1.46876	51.61681	0.15988	17.48100	112.18135	19.83146
Unit Runoff (in/hr)....	1.34379	0.27999	2.10368	0.48759	2.16149	0.22592
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S3#1	D-S_S3#2	D-S_S9#1	D-S_S9#2	McGaw_SW1#1	McGaw_SW1#2
Area (acres).....	4.73300	44.03800	0.00400	28.23400	9.22000	7.90000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						
Total Runoff Depth (in)	0.00000	0.32046	0.00000	0.70590	0.00000	0.33035
Total Losses (in).....	0.00000	2.57954	0.00000	2.19410	0.00000	2.56965

Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	6.37084	0.00000	13.91434	0.00000	2.05841
Total Impervious Area						

Total Runoff Depth (in)	2.68193	0.00000	2.67755	0.00000	2.68802	0.00000
Peak Runoff Rate (cfs).	8.99148	0.00000	0.00768	0.00000	20.35295	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.68193	0.32046	2.67755	0.70590	2.68802	0.33035
Peak Runoff Rate (cfs).	8.99148	6.37084	0.00768	13.91434	20.35295	2.05841
Unit Runoff (in/hr)....	1.89974	0.14467	1.91991	0.49282	2.20748	0.26056
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S6#2	D-S_S8#1	D-S_S8#2	D-S_S7#1	D-S_S7#2	McGaw_SW2#1
Area (acres).....	84.15200	5.11800	86.82700	0.04900	110.86000	41.12000
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.65852	0.00000	0.47446	0.00000	0.67197	0.00000
Total Losses (in).....	2.24148	0.00000	2.42554	0.00000	2.22803	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	31.26257	0.00000	14.33436	0.00000	35.19095	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	2.68260	0.00000	2.68403	0.00000	2.68271
Peak Runoff Rate (cfs).	0.00000	6.41891	0.00000	0.07160	0.00000	90.49316
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.65852	2.68260	0.47446	2.68403	0.67197	2.68271
Peak Runoff Rate (cfs).	31.26257	6.41891	14.33436	0.07160	35.19095	90.49316
Unit Runoff (in/hr)....	0.37150	1.25418	0.16509	1.46130	0.31744	2.20071
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_SW2#2	D-S_S5#1	D-S_S5#2	D-S_S4#1	D-S_S4#2	D-S_S2#1
Area (acres).....	18.32000	7.77400	118.67600	7.78200	52.11100	0.12400
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.32970	0.00000	0.57410	0.00000	0.32363	0.00000
Total Losses (in).....	2.57030	0.00000	2.32590	0.00000	2.57637	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	4.71580	0.00000	33.31523	0.00000	4.98253	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	2.67995	0.00000	2.68308	0.00000	2.68411
Peak Runoff Rate (cfs).	0.00000	12.38974	0.00000	10.21552	0.00000	0.22729
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.32970	2.67995	0.57410	2.68308	0.32363	2.68411
Peak Runoff Rate (cfs).	4.71580	12.38974	33.31523	10.21552	4.98253	0.22729
Unit Runoff (in/hr)....	0.25741	1.59374	0.28072	1.31271	0.09561	1.83302
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S2#2	D-S_S11#1	D-S_S11#2	D-S_S10#1	D-S_S10#2	McGaw_SE1#1
Area (acres).....	103.73900	11.71100	51.90000	1.74400	153.66700	11.93000
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400
Pervious Area						

Total Runoff Depth (in)	0.66761	0.00000	0.38717	0.00000	0.61517	0.00000
Total Losses (in).....	2.23239	0.00000	2.51283	0.00000	2.28483	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	43.69351	0.00000	8.64531	0.00000	45.58109	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	2.68263	0.00000	2.67966	0.00000	2.68113
Peak Runoff Rate (cfs).	0.00000	19.87138	0.00000	2.66468	0.00000	21.62803
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	0.66761	2.68263	0.38717	2.67966	0.61517	2.68113
Peak Runoff Rate (cfs).	43.69351	19.87138	8.64531	2.66468	45.58109	21.62803
Unit Runoff (in/hr)....	0.42119	1.69681	0.16658	1.52791	0.29662	1.81291
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_SE1#2	McGaw_E1#1	McGaw_E1#2	D-S_S1#2	McGaw_NE1#1	McGaw_NE1#2
Area (acres).....	46.24000	32.82000	34.68000	57.90000	17.10000	9.24000
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400	2.20400	2.20400	2.20400

Pervious Area						
Total Runoff Depth (in)	0.53858	0.00000	0.32815	0.63945	0.00000	0.32797
Total Losses (in).....	2.36142	0.00000	2.57185	2.26055	0.00000	2.57203
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	14.14310	0.00000	7.68249	27.21132	0.00000	2.31357
Total Impervious Area						
Total Runoff Depth (in)	0.00000	2.67013	0.00000	0.00000	2.66861	0.00000
Peak Runoff Rate (cfs).	0.00000	70.90297	0.00000	0.00000	37.38346	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	0.53858	2.67013	0.32815	0.63945	2.66861	0.32797
Peak Runoff Rate (cfs).	14.14310	70.90297	7.68249	27.21132	37.38346	2.31357
Unit Runoff (in/hr)....	0.30586	2.16036	0.22153	0.46997	2.18617	0.25039
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_M2#2	D-S_N1.1#1	D-S_N1.1#2
Area (acres).....	85.03900	2.47000	13.36200
Percent Impervious.....	0.00000	100.00000	0.00000
Total Rainfall (in)....	2.90000	2.90000	2.90000
Max Intensity (in/hr)..	2.20400	2.20400	2.20400
Pervious Area			
Total Runoff Depth (in)	0.59126	0.00000	0.44937
Total Losses (in).....	2.30874	0.00000	2.45063
Remaining Depth (in)...	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	28.64456	0.00000	2.98721
Total Impervious Area			
Total Runoff Depth (in)	0.00000	2.68399	0.00000
Peak Runoff Rate (cfs).	0.00000	4.35518	0.00000
Impervious Area with depression storage			
Total Runoff Depth (in)	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000
Impervious Area without depression storage			
Total Runoff Depth (in)	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000
Total Area			
Total Runoff Depth (in)	0.59126	2.68399	0.44937
Peak Runoff Rate (cfs).	28.64456	4.35518	2.98721
Unit Runoff (in/hr)....	0.33684	1.76323	0.22356
Rational Formula			
Pervious Tc. (mins)....	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000

```
===> Runoff simulation ended normally.

#########################################################
#    Entry made to the HYDRAULIC Layer(Block) of SWMM #
```

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#    Last Updated October,2000 by XP Software        #

    Proposed Landuse Conditions for Swan Creek Watershed
    Fitchburg McGaw Park Neighborhood Plan

*=========================================================*
|        HYDRAULICS TABLES IN THE OUTPUT FILE             |
|  These are the more important tables in the output file.|
|  You can use your editor to find the table numbers,     |
|  for example: search for Table E20 to check continuity. |
|  This output file can be imported into a Word Processor |
|  and printed on US letter or A4 paper using portrait    |
|  mode, courier font, a size of 8 pt. and margins of 0.75|
|                                                         |
| Table E1   - Basic Conduit Data                         |
| Table E2   - Conduit Factor Data                        |
| Table E3a  - Junction Data                              |
| Table E3b  - Junction Data                              |
| Table E4   - Conduit Connectivity Data                  |
| Table E4a  - Dry Weather Flow Data                      |
| Table E4b  - Real Time Control Data                     |
| Table E5   - Junction Time Step Limitation Summary      |
| Table E5a  - Conduit Explicit Condition Summary         |
| Table E6   - Final Model Condition                      |
| Table E7   - Iteration Summary                          |
| Table E8   - Junction Time Step Limitation Summary      |
| Table E9   - Junction  Summary  Statistics              |
| Table E10  - Conduit   Summary  Statistics              |
| Table E11  - Area assumptions used in the analysis      |
| Table E12  - Mean conduit information                   |
| Table E13  - Channel losses(H) and culvert info         |
| Table E13a - Culvert Analysis Classification            |
| Table E14  - Natural Channel Overbank Flow Information  |
| Table E14a - Natural Channel Encroachment Information   |
| Table E14b - Floodplain Mapping                         |
| Table E15  - Spreadsheet Info List                      |
| Table E15a - Spreadsheet Reach List                     |
| Table E16  - New Conduit Output Section                 |
| Table E17  - Pump Operation                             |
| Table E18  - Junction Continuity Error                  |
| Table E19  - Junction Inflow Sources                    |
| Table E20  - Junction Flooding and Volume List          |
| Table E21  - Continuity balance at simulation end       |
| Table E22  - Model Judgement Section                    |
*=========================================================*


*================================================*
|          Table E1 - Conduit Data               |
*================================================*
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Inp Num	Conduit Name	Length (ft)	Conduit Class	Area (ft^2)	Manning Coef.	Max Width (ft)	Depth (ft)	Trapezoid Side Slopes	
1	N_Link2	260.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
2	N_Link1	378.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
3	M_Link3	830.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
4	M_Link2	1350.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
5	M_Link1	865.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
6	M_Link0	100.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
7	Runoff_N1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
8	Runoff_M2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
9	S_Link5	1254.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
10	S_Link4	1268.0000	Natural	2001.3996	0.0500	359.0094	10.7000		
11	S_Link3	1224.0000	Natural	5595.6413	0.0500	969.0769	17.0000		
12	S_Link2	1138.0000	Natural	1200.8148	0.0500	498.2912	11.5000		
13	S_Link1	352.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
14	S_Link6	2140.0000	Natural	2001.3996	0.0500	359.0094	10.7000		
15	Runoff_S1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
16	Runoff_S2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
17	Runoff_S3	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
18	S_Link10	911.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
19	S_Link9	775.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
20	S_Link8	420.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
21	S_Link7	750.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
22	Runoff_S4	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
23	S_Link12	1316.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
24	S_Link11	415.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
25	S_Link14	1419.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
26	S_Link13	1262.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000

27	Runoff_S6	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
28	Runoff_S5	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
29	Runoff_S8	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
30	Runoff_S7	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
31	Runoff_S9	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
32	Runoff_US1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
33	S_Link15	2905.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
34	S_link16	680.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
35	Runoff_S10	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
36	Runoff_S11	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
37	N_Link6	24.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
38	N_Link5	740.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
39	N_Link3	3300.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
40	N_Link7	527.8000	Trapezoid	240.0000	0.0300	40.0000	6.0000	0.0000	0.0000
41	N_Link9	936.3700	Trapezoid	450.0000	0.0500	75.0000	6.0000	0.0000	0.0000
42	N_Link8	1560.0000	Trapezoid	240.0000	0.0300	40.0000	6.0000	0.0000	0.0000
43	Runoff_N2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
44	Runoff_N3	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
45	Runoff_N8	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
46	Runoff_N5	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
47	NonameRd	95.0000	Rectangle	20.0000	0.0140	5.0000	4.0000		
48	N_Link11.1	50.0000	Rectangle	12.0000	0.0140	4.0000	3.0000		
49	N_Link11	408.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
50	LacyRd_N3b	71.0000	H Ellipse	29.5000	0.0140	7.5833	4.8333		
51	LacyRd_N3a	201.0000	Circular	15.9043	0.0140	4.5000	4.5000		
52	N_Link10	880.0000	Trapezoid	300.0000	0.0500	50.0000	6.0000	0.0000	0.0000
53	Runoff_N6	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
54	Roff_US_N1	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
55	N_Link14	1383.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
56	Roff_US_N2	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
57	N_Link16	1422.0000	Trapezoid	80.0000	0.0300	4.0000	4.0000	4.0000	4.0000
58	Runoff_N7	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
59	N_Link12	640.0000	Natural	433.9710	0.0500	158.9321	6.0000		
60	N_Link12.1	460.0000	Natural	321.2769	0.0500	204.7484	3.0000		
61	Runoff_N2.	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
62	Runoff_N1.	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
63	N_Link4	480.0000	Trapezoid	300.0000	0.0500	10.0000	10.0000	2.0000	2.0000
64	RR_br	12.0000	Rectangle	200.0000	0.0300	20.0000	10.0000		
65	Link120	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
66	N_Combine	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
67	Link124	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
68	Link128	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
69	N_Combine.	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
70	Link156	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
71	Link160	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
72	Link152	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
73	SE2_Link	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
74	Link148	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
75	Link144	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
76	Link140	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
77	Link132	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
78	Link136	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
79	Link166	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
80	Link167	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
81	Link169	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
82	Link170	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
83	Link171	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
84	Link172	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
85	Link174	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
86	Link175	100.0000	Trapezoid	80.0000	0.0500	4.0000	4.0000	4.0000	4.0000
87	USH14_NCul	185.0000	Rectangle	84.0000	0.0140	14.0000	6.0000		
88	LacyN1_Cul	134.0000	Rectangle	72.0000	0.0140	12.0000	6.0000		
89	280.1	33.0000	Rectangle	36.0000	0.0500	6.0000	6.0000		
90	Lacy_MCulv	60.0000	Rectangle	99.0000	0.0240	18.0000	5.5000		
91	284.1	60.0000	Rectangle	136.5000	0.0240	21.0000	6.5000		
92	USH14_SCul	186.0000	Rectangle	48.0000	0.0140	8.0000	6.0000		
93	EHill_Culv	73.0000	Circular	19.6350	0.0240	5.0000	5.0000		
94	SyeneS1Cul	45.0000	Arch	17.7000	0.0240	6.0833	3.7500		
95	Irish1Culv	45.0000	Rectangle	15.0000	0.0240	5.0000	3.0000		
96	Irish2Culv	60.0000	Circular	4.9087	0.0240	2.5000	2.5000		
97	Irish3Culv	60.0000	Rectangle	16.0000	0.0240	8.0000	2.0000		
98	RR_S3Culv	60.0000	Rectangle	15.0000	0.0240	3.0000	5.0000		
99	Irish0Culv	60.0000	Rectangle	12.0000	0.0240	6.0000	2.0000		
100	SyeneN1_Cu	45.0000	Arch	7.0000	0.0240	3.3333	2.5833		
101	LacyN2_Cul	62.0000	Arch	7.0000	0.0240	3.3333	2.5833		
102	SyeneN2_Cu	120.0000	Circular	33.1831	0.0240	6.5000	6.5000		
103	SyeneN1_C	86.7000	Rectangle	32.0000	0.0140	8.0000	4.0000		
104	JonesFrm_C	86.0000	Rectangle	32.0000	0.0140	8.0000	4.0000		
105	592.1	10.0000	Circular	1.7671	0.0140	1.5000	1.5000		
106	SwnCrNout	300.0000	Closd Cnd	0.0000	0.0140	4.0000	4.0000		

107	SwnCkSout	300.0000	Closd Cnd	0.0000	0.0140	3.0000	3.0000
108	NW1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
109	N1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
110	N2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
111	SW2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
112	SW1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
113	SE2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
114	SE1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
115	E1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
116	NE1_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
117	NE3_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000
118	NE2_vweir	300.0000	Closd Cnd	0.0000	0.0140	0.0000	0.0000

Total length of all conduits .... 45172.8700 feet

Table E3a - Junction Data

Inp Num	Junction Name	Ground Elevation	Crown Elevation	Invert Elevation	Qinst cfs	Initial Depth-ft	Interface Flow (%)
1	N1	880.0000	878.0000	868.0000	0.0000	0.0000	100.0000
2	USH14_NDet	880.0000	878.5000	868.2000	0.0000	0.0000	100.0000
3	LacyRd_Det	880.0000	877.8000	867.8000	0.0000	0.0000	100.0000
4	N0	880.0000	876.5000	866.5000	0.0000	0.0000	100.0000
5	M7	880.0000	875.0000	865.0000	0.0000	0.0000	100.0000
6	S0	880.0000	878.0000	868.0000	0.0000	0.0000	100.0000
7	S1	900.0000	879.8000	868.3000	0.0000	0.0000	100.0000
8	S2	900.0000	892.7000	875.7000	0.0000	0.0000	100.0000
9	M6	880.0000	873.0000	863.0000	0.0000	0.0000	100.0000
10	M5	875.0000	872.5000	862.5000	0.0000	0.0000	100.0000
11	M4	880.0000	871.5000	861.5000	0.0000	0.0000	100.0000
12	M3	880.0000	871.0000	861.0000	0.0000	0.0000	100.0000
13	M1	870.0000	869.0000	859.0000	0.0000	0.0000	100.0000
14	M0	870.0000	868.0000	858.0000	0.0000	0.0000	100.0000
15	M_out	870.0000	867.0000	857.0000	0.0000	0.0000	100.0000
16	D-S_N1	880.0000	872.8000	868.8000	0.0000	0.0000	100.0000
17	D-S_M2	880.0000	868.0000	864.0000	0.0000	0.0000	100.0000
18	S3	910.0000	897.0000	880.0000	0.0000	0.0000	100.0000
19	S4	1000.0000	898.7000	888.0000	0.0000	0.0000	100.0000
20	S6	920.0000	918.2000	907.5000	0.0000	0.0000	100.0000
21	S5	930.0000	916.8000	912.4000	0.0000	0.0000	100.0000
22	McGaw_NE1	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
23	D-S_S1	885.0000	880.7000	876.7000	0.0000	0.0000	100.0000
24	D-S_S2	910.0000	893.0000	889.0000	0.0000	0.0000	100.0000
25	D-S_S3	920.0000	913.0000	909.0000	0.0000	0.0000	100.0000
26	S7	930.0000	924.6000	914.6000	0.0000	0.0000	100.0000
27	S8	930.0000	925.0000	915.0000	0.0000	0.0000	100.0000
28	S9	930.0000	927.7000	917.7000	0.0000	0.0000	100.0000
29	S10	930.0000	928.2000	918.2000	0.0000	0.0000	100.0000
30	S11	940.0000	938.0000	928.0000	0.0000	0.0000	100.0000
31	S12	950.0000	947.6000	937.6000	0.0000	0.0000	100.0000
32	EHill_DetS	955.0000	945.0000	940.0000	0.0000	0.0000	100.0000
33	D-S_S4	940.0000	933.0000	929.0000	0.0000	0.0000	100.0000
34	S13	960.0000	956.0000	952.0000	0.0000	0.0000	100.0000
35	S14	990.0000	981.8000	977.8000	0.0000	0.0000	100.0000
36	S16	990.0000	976.0000	972.0000	0.0000	0.0000	100.0000
37	S17	1000.0000	985.0000	981.0000	0.0000	0.0000	100.0000
38	S18	1000.0000	984.3000	980.3000	0.0000	0.0000	100.0000
39	S15	1000.0000	983.2000	979.2000	0.0000	0.0000	100.0000
40	D-S_S6	990.0000	986.0000	982.0000	0.0000	0.0000	100.0000
41	D-S_S5	960.0000	957.0000	953.0000	0.0000	0.0000	100.0000
42	D-S_S8	1000.0000	986.0000	982.0000	0.0000	0.0000	100.0000
43	D-S_S7	990.0000	985.3000	981.3000	0.0000	0.0000	100.0000
44	D-S_S9	990.0000	984.2000	980.2000	0.0000	0.0000	100.0000
45	U-S_S1	930.0000	917.8000	913.8000	0.0000	0.0000	100.0000
46	RR_Det3	930.0000	920.0000	915.0000	0.0000	0.0000	100.0000
47	RR_Det4	930.0000	915.0000	910.0000	0.0000	0.0000	100.0000
48	S19	920.0000	912.0000	907.5000	0.0000	0.0000	100.0000
49	Irish_Det0	920.0000	914.0000	907.5000	0.0000	0.0000	100.0000
50	D-S_S10	920.0000	915.0000	911.0000	0.0000	0.0000	100.0000
51	D-S_S11	930.0000	920.0000	916.0000	0.0000	0.0000	100.0000
52	N2	900.0000	894.0000	884.0000	0.0000	0.0000	100.0000
53	N3	900.0000	898.0000	886.0000	0.0000	0.0000	100.0000
54	N5	910.0000	898.5000	894.5000	0.0000	0.0000	100.0000
55	N6	910.0000	899.3000	895.3000	0.0000	0.0000	100.0000
56	N7	910.0000	899.6000	895.6000	0.0000	0.0000	100.0000
57	N8	910.0000	900.3000	896.3000	0.0000	0.0000	100.0000
58	N4	910.0000	893.5000	887.0000	0.0000	0.0000	100.0000
59	SwanCk_N	910.0000	898.0000	892.0000	0.0000	0.0000	100.0000

60	SwanCk_S	920.0000	899.0000	893.0000	0.0000	0.0000	100.0000
61	N10	900.0000	899.9400	893.9400	0.0000	0.0000	100.0000
62	N9	900.0000	899.6000	893.6000	0.0000	0.0000	100.0000
63	N12	920.0000	912.2000	906.2000	0.0000	0.0000	100.0000
64	N11	920.0000	911.2000	905.2000	0.0000	0.0000	100.0000
65	N10.1	910.0000	905.0000	899.0000	0.0000	0.0000	100.0000
66	D-S_N2	880.0000	873.5000	869.5000	0.0000	0.0000	100.0000
67	D-S_N3	910.0000	904.0000	900.0000	0.0000	0.0000	100.0000
68	D-S_N8	900.0000	897.0000	893.0000	0.0000	0.0000	100.0000
69	D-S_N5	920.0000	911.2000	907.2000	0.0000	0.0000	100.0000
70	N13	926.2500	921.8000	915.8000	0.0000	0.0000	100.0000
71	N14	926.2500	921.2333	916.4000	0.0000	0.0000	100.0000
72	N15	940.0000	930.8000	920.8000	0.0000	0.0000	100.0000
73	CrossDetE	960.0000	945.0000	941.0000	0.0000	0.0000	100.0000
74	CrossDetW	1010.0000	947.0000	943.0000	0.0000	0.0000	100.0000
75	N16	980.0000	950.3000	940.3000	0.0000	0.0000	100.0000
76	QuarryHDet	1015.0000	1008.0000	1000.5000	0.0000	0.0000	100.0000
77	D-S_N6	950.0000	948.0000	944.0000	0.0000	0.0000	100.0000
78	U-S_N1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
79	N19	1010.0000	1004.5000	1000.5000	0.0000	0.0000	100.0000
80	N17	1000.0000	982.0000	976.0000	0.0000	0.0000	100.0000
81	U-S_N2	1035.0000	1027.0000	1023.0000	0.0000	0.0000	100.0000
82	NobelDrDet	1030.0000	1026.0000	1019.5000	0.0000	0.0000	100.0000
83	N20	1030.0000	1023.0000	1019.0000	0.0000	0.0000	100.0000
84	D-S_N7	940.0000	925.8000	921.8000	0.0000	0.0000	100.0000
85	D-S_N6.1	955.0000	953.9500	947.9500	0.0000	0.0000	100.0000
86	D-S_N2.1	895.0000	889.0000	885.0000	0.0000	0.0000	100.0000
87	D-S_N1.1	870.0000	864.0000	860.0000	0.0000	0.0000	100.0000
88	N3.1	900.0000	897.7000	887.7000	0.0000	0.0000	100.0000
89	SwanCk_C	900.0000	896.0000	886.0000	0.0000	4.0000	100.0000
90	Node36	930.0000	916.0000	912.0000	0.0000	0.0000	100.0000
91	McGaw_NW1	1015.0000	1011.0000	1007.0000	0.0000	0.0000	100.0000
92	NW1_infil	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
93	NW1_pump	1010.0000	1006.0000	1006.0000	0.0000	0.0000	100.0000
94	NW1_det	1010.0000	1001.5000	1001.5000	0.0000	0.0000	100.0000
95	Node42	990.0000	981.0000	977.0000	0.0000	0.0000	100.0000
96	McGaw_N1	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
97	McGaw_N2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
98	Node49	1010.0000	948.0000	944.0000	0.0000	0.0000	100.0000
99	N1_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
100	N1_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
101	N1_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
102	N2_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
103	N2_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
104	N2_pump	1010.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
105	Node49.1	980.0000	945.3000	941.3000	0.0000	0.0000	100.0000
106	SW2_det	1010.0000	997.5000	997.5000	0.0000	0.0000	100.0000
107	SW2_infil	1010.0000	1006.0000	1002.0000	0.0000	0.0000	100.0000
108	SW2_pump	1010.0000	1002.0000	1002.0000	0.0000	0.0000	100.0000
109	McGaw_SW2	1010.0000	1007.0000	1003.0000	0.0000	0.0000	100.0000
110	Node37.1	1000.0000	985.3000	981.3000	0.0000	0.0000	100.0000
111	McGaw_SW1	1015.0000	1013.0000	1009.0000	0.0000	0.0000	100.0000
112	SW1_infil	1015.0000	1012.0000	1008.0000	0.0000	0.0000	100.0000
113	SW1_det	1015.0000	1003.5000	1003.5000	0.0000	0.0000	100.0000
114	SW1_pump	1015.0000	1008.0000	1008.0000	0.0000	0.0000	100.0000
115	McGaw_SE2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
116	SE2_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
117	SE2_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
118	SE2_det	1015.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
119	Node89	930.0000	917.8000	913.8000	0.0000	0.0000	100.0000
120	McGaw_SE1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
121	SE1_infil	1015.0000	1008.0000	1004.0000	0.0000	0.0000	100.0000
122	SE1_det	1015.0000	999.5000	999.5000	0.0000	0.0000	100.0000
123	SE1_pump	1015.0000	1004.0000	1004.0000	0.0000	0.0000	100.0000
124	Node90	1000.0000	893.0000	889.0000	0.0000	0.0000	100.0000
125	McGaw_E1	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
126	E1_infil	1015.0000	1008.0000	1004.0000	0.0000	0.0000	100.0000
127	E1_pump	1010.0000	1004.0000	1004.0000	0.0000	0.0000	100.0000
128	E1_det	1010.0000	999.5000	999.5000	0.0000	0.0000	100.0000
129	Node51.1	910.0000	885.0000	881.0000	0.0000	0.0000	100.0000
130	NE1_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
131	NE1_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
132	NE1_det	1015.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
133	Node51.2	900.0000	873.3000	869.3000	0.0000	0.0000	100.0000
134	McGaw_NE3	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
135	McGaw_NE2	1015.0000	1010.0000	1006.0000	0.0000	0.0000	100.0000
136	Node50	910.0000	901.3000	897.3000	0.0000	0.0000	100.0000
137	NE3_infil	1015.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
138	NE3_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
139	NE3_pump	1015.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000

140	NE2_det	1010.0000	1000.5000	1000.5000	0.0000	0.0000	100.0000
141	NE2_pump	1010.0000	1005.0000	1005.0000	0.0000	0.0000	100.0000
142	NE2_infil	1010.0000	1009.0000	1005.0000	0.0000	0.0000	100.0000
143	Node87	910.0000	900.6000	896.6000	0.0000	0.0000	100.0000
144	Node91	1000.0000	984.2000	980.2000	0.0000	0.0000	100.0000

Table E4 - Conduit Connectivity

Input Number	Conduit Name	Upstream Node	Downstream Node	Upstream Elevation	Downstream Elevation	
1	N_Link2	N1	LacyRd_Det	868.0000	867.8000	No Design
2	N_Link1	N0	M7	866.5000	865.0000	No Design
3	M_Link3	M7	M6	865.0000	863.0000	No Design
4	M_Link2	M5	M4	862.5000	861.5000	No Design
5	M_Link1	M3	M1	861.0000	859.0000	No Design
6	M_Link0	M0	M_out	858.0000	857.0000	No Design
7	Runoff_N1	D-S_N1	LacyRd_Det	868.8000	867.8000	No Design
8	Runoff_M2	D-S_M2	M6	864.0000	863.0000	No Design
9	S_Link5	S5	S4	912.4000	888.0000	No Design
10	S_Link4	S4	S3	888.0000	880.0000	No Design
11	S_Link3	S3	S2	880.0000	875.7000	No Design
12	S_Link2	S2	S1	875.7000	868.3000	No Design
13	S_Link1	S0	M7	868.0000	865.0000	No Design
14	S_Link6	S6	S4	907.5000	888.0000	No Design
15	Runoff_S1	D-S_S1	S2	876.7000	875.7000	No Design
16	Runoff_S2	D-S_S2	S4	889.0000	888.0000	No Design
17	Runoff_S3	D-S_S3	S6	909.0000	908.0000	No Design
18	S_Link10	S12	S11	937.6000	928.0000	No Design
19	S_Link9	S11	S10	928.0000	918.2000	No Design
20	S_Link8	S9	S8	917.7000	915.0000	No Design
21	S_Link7	S7	S6	914.6000	908.0000	No Design
22	Runoff_S4	D-S_S4	S11	929.0000	928.0000	No Design
23	S_Link12	S14	S13	977.8000	952.0000	No Design
24	S_Link11	S13	EHill_DetS	952.0000	940.0000	No Design
25	S_Link14	S17	S16	981.0000	972.0000	No Design
26	S_Link13	S16	S13	972.0000	952.0000	No Design
27	Runoff_S6	D-S_S6	S17	982.0000	981.0000	No Design
28	Runoff_S5	D-S_S5	S13	953.0000	952.0000	No Design
29	Runoff_S8	D-S_S8	S17	982.0000	981.0000	No Design
30	Runoff_S7	D-S_S7	S18	981.3000	980.3000	No Design
31	Runoff_S9	D-S_S9	S15	980.2000	979.2000	No Design
32	Runoff_US1	U-S_S1	S5	913.8000	912.8000	No Design
33	S_Link15	S19	S4	908.0000	888.0000	No Design
34	S_link16	Node36	Irish_Det0	912.0000	907.5000	No Design
35	Runoff_S10	D-S_S10	Irish_Det0	911.0000	910.0000	No Design
36	Runoff_S11	D-S_S11	RR_Det3	916.0000	915.0000	No Design
37	N_Link6	N7	N6	895.6000	895.3000	No Design
38	N_Link5	N5	N3	894.5000	888.0000	No Design
39	N_Link3	N2	USH14_NDet	884.0000	868.5000	No Design
40	N_Link7	N9	SwanCk_N	893.6000	892.0000	No Design
41	N_Link9	N11	SwanCk_S	905.2000	893.0000	No Design
42	N_Link8	N10.1	N10	899.0000	893.9400	No Design
43	Runoff_N2	D-S_N2	USH14_NDet	869.5000	868.5000	No Design
44	Runoff_N3	D-S_N3	N10.1	900.0000	899.0000	No Design
45	Runoff_N8	D-S_N8	SwanCk_N	893.0000	892.0000	No Design
46	Runoff_N5	D-S_N5	N12	907.2000	906.2000	No Design
47	NonameRd	CrossDetW	CrossDetE	943.0000	941.0000	No Design
48	N_Link11.1	CrossDetE	N16	941.0000	940.3000	No Design
49	N_Link11	N16	N15	940.3000	920.8000	No Design
50	LacyRd_N3b	N15	N14	920.8000	916.4000	No Design
51	LacyRd_N3a	N14	N13	916.4000	915.8000	No Design
52	N_Link10	N13	N12	915.8000	906.2000	No Design
53	Runoff_N6	D-S_N6	CrossDetW	944.0000	943.0000	No Design
54	Roff_US_N1	U-S_N1	QuarryHDet	1005.0000	1004.0000	No Design
55	N_Link14	N19	N17	1000.5000	976.0000	No Design
56	Roff_US_N2	U-S_N2	NobelDrDet	1023.0000	1022.0000	No Design
57	N_Link16	N20	N17	1019.0000	976.0000	No Design
58	Runoff_N7	D-S_N7	N15	921.8000	920.8000	No Design
59	N_Link12	N17	D-S_N6.1	976.0000	947.9500	No Design
60	N_Link12.1	D-S_N6.1	CrossDetW	947.9500	943.0000	No Design
61	Runoff_N2.	D-S_N2.1	N2	885.0000	884.0000	No Design
62	Runoff_N1.	D-S_N1.1	M1	860.0000	859.0000	No Design
63	N_Link4	N3.1	N2	887.7000	884.0000	No Design
64	RR_br	N3	N3.1	888.0000	887.7000	No Design
65	Link120	McGaw_NW1	NW1_infil	1007.0000	1006.0000	No Design
66	N_Combine	Node49	CrossDetW	944.0000	943.0000	No Design
67	Link124	McGaw_N1	N1_infil	1006.0000	1005.0000	No Design

68	Link128	McGaw_N2	N2_infil	1006.0000	1005.0000	No Design
69	N_Combine.	Node49.1	N16	941.3000	940.3000	No Design
70	Link156	McGaw_SW2	SW2_infil	1003.0000	1002.0000	No Design
71	Link160	McGaw_SW1	SW1_infil	1009.0000	1008.0000	No Design
72	Link152	McGaw_SE2	SE2_infil	1006.0000	1005.0000	No Design
73	SE2_Link	Node89	S5	913.8000	912.8000	No Design
74	Link148	McGaw_SE1	SE1_infil	1005.0000	1004.0000	No Design
75	Link144	McGaw_E1	E1_infil	1005.0000	1004.0000	No Design
76	Link140	McGaw_NE1	NE1_infil	1006.0000	1005.0000	No Design
77	Link132	McGaw_NE3	NE3_infil	1006.0000	1005.0000	No Design
78	Link136	McGaw_NE2	NE2_infil	1006.0000	1005.0000	No Design
79	Link166	Node42	N17	977.0000	976.0000	No Design
80	Link167	Node50	N8	897.3000	896.3000	No Design
81	Link169	Node87	N7	896.6000	895.6000	No Design
82	Link170	Node51.2	S1	869.3000	868.3000	No Design
83	Link171	Node51.1	S3	881.0000	880.0000	No Design
84	Link172	Node90	S4	889.0000	888.0000	No Design
85	Link174	Node91	S15	980.2000	979.2000	No Design
86	Link175	Node37.1	S18	981.3000	980.3000	No Design
87	USH14_NCul	USH14_NDet	N1	868.2000	868.0000	No Design
88	LacyN1_Cul	LacyRd_Det	N0	867.8000	866.5000	No Design
89	280.1	M6	M5	863.0000	862.5000	No Design
90	Lacy_MCulv	M4	M3	861.5000	861.0000	No Design
91	284.1	M1	M0	859.0000	858.0000	No Design
92	USH14_SCul	S1	S0	868.3000	868.0000	No Design
93	EHill_Culv	EHill_DetS	S12	940.0000	937.6000	No Design
94	SyeneS1Cul	S10	S9	918.2000	917.7000	No Design
95	Irish1Culv	S8	S7	915.0000	914.6000	No Design
96	Irish2Culv	S15	S14	979.2000	977.8000	No Design
97	Irish3Culv	S17	S18	981.0000	980.3000	No Design
98	RR_S3Culv	RR_Det3	RR_Det4	915.0000	910.0000	No Design
99	Irish0Culv	Irish_Det0	S19	907.5000	907.5000	No Design
100	SyeneN1_Cu	N8	N7	896.3000	895.6000	No Design
101	LacyN2_Cul	N6	N5	895.3000	894.5000	No Design
102	SyeneN2_Cu	N4	N3	887.0000	886.0000	No Design
103	SyeneN1_C	N10	N9	893.9400	893.6100	No Design
104	JonesFrm_C	N12	N11	906.2000	905.2000	No Design
105	592.1	NobelDrDet	N20	1019.5000	1019.0000	No Design
106	SwnCrNout	SwanCk_N	SwanCk_C	892.0000	892.0000	No Design
107	SwnCkSout	SwanCk_S	SwanCk_C	893.0000	893.0000	No Design
108	NW1_vweir	NW1_det	Node42	1001.5000	977.0000	No Design
109	N1_vweir	N1_det	Node49	1000.5000	944.0000	No Design
110	N2_vweir	N2_det	Node49.1	1000.5000	941.3000	No Design
111	SW2_vweir	SW2_det	Node37.1	997.5000	981.3000	No Design
112	SW1_vweir	SW1_det	Node91	1003.5000	980.2000	No Design
113	SE2_vweir	SE2_det	Node89	1000.5000	913.8000	No Design
114	SE1_vweir	SE1_det	Node90	999.5000	889.0000	No Design
115	E1_vweir	E1_det	Node51.1	999.5000	881.0000	No Design
116	NE1_vweir	NE1_det	Node51.2	1000.5000	869.3000	No Design
117	NE3_vweir	NE3_det	Node50	1000.5000	897.3000	No Design
118	NE2_vweir	NE2_det	Node87	1000.5000	896.6000	No Design

```
*================================================*
|          FREE OUTFALL DATA (DATA GROUP I1)     |
|         BOUNDARY CONDITION ON DATA GROUP J1    |
*================================================*

Outfall at Junction....M_out            has boundary condition number...         1


*================================================*
|        INTERNAL CONNECTIVITY INFORMATION       |
*================================================*
```

CONDUIT	JUNCTION	JUNCTION
1.25in	QuarryHDet	N19
3.25in	QuarryHDet	N19
USH14_NOvr	USH14_NDet	N1
LacyN1_Ovr	LacyRd_Det	N0
PrivateDr	M6	M5
Lacy_MOvr	M4	M3
MM_ovr	M1	M0
USH14_SOvr	S1	S0
EHill_Ovr.1	EHill_DetS	S12
SyeneS1_Ovr	S10	S9
irish1_Ovr.1	S8	S7
Irish2Ovr	S15	S14
Irish3Ovr	S18	S17

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       RR_S3_Ovr          RR_Det3          RR_Det4
    irish0_Ovr.1       Irish_Det0              S19
      SyeneN1_Ov               N8               N7
      LacyN2_Ovr               N6               N5
      SyeneN2_Ov               N4               N3
    SyeneN1_Ov.1              N10               N9
      JonesFrm_O              N12              N11
    Lacy_N3_Ov.1              N15              N13
       StandPipe       QuarryHDet              N19
       QuarryOvr       QuarryHDet              N19
       NobelWeir       NobelDrDet              N20
      SwnCrWeirN         SwanCk_N         SwanCk_C
    SwanCkSout.1         SwanCk_S         SwanCk_C
          Weir10         SwanCk_C               N4
          weir11         SwanCk_C               N4
          weir14         SwanCk_C               N4
         weirtop         SwanCk_C               N4
        RR_S4out          RR_Det4           Node36
       NW1_Iweir        NW1_infil          NW1_det
      NW1_ovweir          NW1_det           Node42
        N1_Iweir         N1_infil           N1_det
      N1_ovrweir           N1_det           Node49
        N2_Iweir         N2_infil           N2_det
      N2_ovrweir           N2_det         Node49.1
      SW2_ovweir          SW2_det         Node37.1
       SW2_Iweir        SW2_infil          SW2_det
       SW1_Iweir        SW1_infil          SW1_det
      SW1_ovweir          SW1_det           Node91
       SE2_Iweir        SE2_infil          SE2_det
      SE2_ovweir          SE2_det           Node89
       SE1_Iweir        SE1_infil          SE1_det
      SE1_ovweir          SE1_det           Node90
        E1_Iweir         E1_infil           E1_det
      E1_ovrweir           E1_det         Node51.1
       NE1_Iweir        NE1_infil          NE1_det
      NE1_ovweir          NE1_det         Node51.2
       NE3_Iweir        NE3_infil          NE3_det
       NE2_Iweir        NE2_infil          NE2_det
      NE3_ovweir          NE3_det           Node50
      NE2_ovweir          NE2_det           Node87
         NW1_inf         NW1_infil         NW1_pump
          N1_inf          N1_infil          N1_pump
          N2_inf          N2_infil          N2_pump
         SW2_inf         SW2_infil         SW2_pump
         SW1_inf         SW1_infil         SW1_pump
         SE2_inf         SE2_infil         SE2_pump
         SE1_inf         SE1_infil         SE1_pump
          E1_inf          E1_infil          E1_pump
         NE1_inf         NE1_infil         NE1_pump
         NE3_inf         NE3_infil         NE3_pump
         NE2_inf         NE2_infil         NE2_pump
        FREE # 1             M_out         BOUNDARY

*================================================*
|        Boundary Condition Information          |
|                Data Groups J1-J4               |
*================================================*


BC NUMBER..         1 Control water surface elevation is..      0.00 feet.


##########################################
# Header information from interface file: #
##########################################

Title from first computational layer:
Proposed Landuse Conditions for Swan Creek Watershed
Montgomery Associates

Title from immediately preceding computational layer
Proposed Landuse Conditions for Swan Creek Watershed
Montgomery Associates

Name of preceding layer:.................        Runoff Layer
Initial Julian date (IDATEZ).....................   1993001
Initial time of day in seconds (TZERO)............       0.0
No. Transfered input locations...................        36
No. Transfered pollutants........................         0
Size of total catchment area (acres).............   2602.67
```

```
 ################################################
 # Element numbers of interface inlet locations: #
 ################################################

 D-S_N2.1         McGaw_NE2        McGaw_NE3        D-S_N3           D-S_N8           D-S_N5           D-S_N6
 U-S_N1           U-S_N2           McGaw_NW1        D-S_N6.1         McGaw_N1         McGaw_N2         D-S_N7
 D-S_N2           D-S_N1           U-S_S1           McGaw_SE2        D-S_S3           D-S_S9           McGaw_SW1
 D-S_S6           D-S_S8           D-S_S7           McGaw_SW2        D-S_S5           D-S_S4           D-S_S2
 D-S_S11          D-S_S10          McGaw_SE1        McGaw_E1         D-S_S1           McGaw_NE1        D-S_M2
 D-S_N1.1

*=====================================================*
 |        Table E9 - JUNCTION SUMMARY STATISTICS        |
 | The Maximum area is only the area of the node, it    |
 | does not include the area of the surrounding conduits|
 *=====================================================*
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Junction Name	Ground Elevation feet	Uppermost PipeCrown Elevation feet	Maximum Junction Elevation feet	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Freeboard of node feet	Maximum Junction Area ft^2	Maximum Gutter Depth feet	Maximum Gutter Width feet	Maximum Gutter Velocity ft/s
N1	880.0000	878.0000	871.1359	14	27	0.0000	8.8641	12.5660	0.0000	0.0000	0.0000
USH14_NDet	880.0000	878.5000	871.1778	14	27	0.0000	8.8222	42497.364	0.0000	0.0000	0.0000
LacyRd_Det	880.0000	877.8000	870.2724	14	37	0.0000	9.7276	18000.530	0.0000	0.0000	0.0000
N0	880.0000	876.5000	870.2432	14	37	0.0000	9.7568	12.5660	0.0000	0.0000	0.0000
M7	880.0000	875.0000	869.9937	14	41	0.0000	10.0063	12.5660	0.0000	0.0000	0.0000
S0	880.0000	878.0000	870.5780	14	44	0.0000	9.4220	12.5660	0.0000	0.0000	0.0000
S1	900.0000	879.8000	870.9848	14	46	0.0000	29.0152	12.5660	0.0000	0.0000	0.0000
S2	900.0000	892.7000	881.0371	14	47	0.0000	18.9629	12.5660	0.0000	0.0000	0.0000
M6	880.0000	873.0000	868.7238	14	46	0.0000	11.2762	12.5660	0.0000	0.0000	0.0000
M5	875.0000	872.5000	868.4219	14	47	0.0000	6.5781	12.5660	0.0000	0.0000	0.0000
M4	880.0000	871.5000	866.4043	14	52	0.0000	13.5957	12.5660	0.0000	0.0000	0.0000
M3	880.0000	871.0000	866.1792	14	52	0.0000	13.8208	12.5660	0.0000	0.0000	0.0000
M1	870.0000	869.0000	861.3166	14	53	0.0000	8.6834	12.5660	0.0000	0.0000	0.0000
M0	870.0000	868.0000	861.3698	14	54	0.0000	8.6302	12.5660	0.0000	0.0000	0.0000
M_out	870.0000	867.0000	859.4840	14	54	0.0000	10.5160	12.5660	0.0000	0.0000	0.0000
D-S_N1	880.0000	872.8000	870.6349	13	2	0.0000	9.3651	12.5660	0.0000	0.0000	0.0000
D-S_M2	880.0000	868.0000	868.7240	14	46	0.7240	11.2760	12.5660	0.0000	0.0000	0.0000
S3	910.0000	897.0000	885.3775	14	37	0.0000	24.6225	12.5660	0.0000	0.0000	0.0000
S4	1000.0000	898.7000	891.6247	13	59	0.0000	108.3753	12.5660	0.0000	0.0000	0.0000
S6	920.0000	918.2000	910.8320	13	42	0.0000	9.1680	12.5660	0.0000	0.0000	0.0000
S5	930.0000	916.8000	913.1541	13	33	0.0000	16.8459	12.5660	0.0000	0.0000	0.0000
McGaw_NE1	1015.0000	1010.0000	1007.5558	12	19	0.0000	7.4442	12.5660	0.0000	0.0000	0.0000
D-S_S1	885.0000	880.7000	881.0373	14	47	0.3373	3.9627	12.5660	0.0000	0.0000	0.0000
D-S_S2	910.0000	893.0000	891.6264	13	58	0.0000	18.3736	12.5660	0.0000	0.0000	0.0000
D-S_S3	920.0000	913.0000	910.8328	13	42	0.0000	9.1672	12.5660	0.0000	0.0000	0.0000
S7	930.0000	924.6000	916.9050	13	31	0.0000	13.0950	12.5660	0.0000	0.0000	0.0000
S8	930.0000	925.0000	917.8988	13	30	0.0000	12.1012	12.5660	0.0000	0.0000	0.0000
S9	930.0000	927.7000	920.1056	13	27	0.0000	9.8944	12.5660	0.0000	0.0000	0.0000
S10	930.0000	928.2000	920.8430	13	27	0.0000	9.1570	12.5660	0.0000	0.0000	0.0000
S11	940.0000	938.0000	930.0932	13	25	0.0000	9.9068	12.5660	0.0000	0.0000	0.0000
S12	950.0000	947.6000	939.6903	13	22	0.0000	10.3097	12.5660	0.0000	0.0000	0.0000
EHill_DetS	955.0000	945.0000	944.9303	13	22	0.0000	10.0697	19442.771	0.0000	0.0000	0.0000
D-S_S4	940.0000	933.0000	930.1415	13	23	0.0000	9.8585	12.5660	0.0000	0.0000	0.0000
S13	960.0000	956.0000	953.6026	13	7	0.0000	6.3974	12.5660	0.0000	0.0000	0.0000
S14	990.0000	981.8000	978.4670	12	58	0.0000	11.5330	12.5660	0.0000	0.0000	0.0000
S16	990.0000	976.0000	973.4637	13	10	0.0000	16.5363	12.5660	0.0000	0.0000	0.0000
S17	1000.0000	985.0000	983.0585	13	3	0.0000	16.9415	12.5660	0.0000	0.0000	0.0000
S18	1000.0000	984.3000	983.3331	13	5	0.0000	16.6669	12.5660	0.0000	0.0000	0.0000
S15	1000.0000	983.2000	981.6915	12	53	0.0000	18.3085	12.5660	0.0000	0.0000	0.0000
D-S_S6	990.0000	986.0000	983.3059	12	51	0.0000	6.6941	12.5660	0.0000	0.0000	0.0000
D-S_S5	960.0000	957.0000	954.5802	12	51	0.0000	5.4198	12.5660	0.0000	0.0000	0.0000
D-S_S8	1000.0000	986.0000	983.1849	13	6	0.0000	16.8151	12.5660	0.0000	0.0000	0.0000
D-S_S7	990.0000	985.3000	983.3824	13	4	0.0000	6.6176	12.5660	0.0000	0.0000	0.0000
D-S_S9	990.0000	984.2000	981.7055	12	52	0.0000	8.2945	12.5660	0.0000	0.0000	0.0000
U-S_S1	930.0000	917.8000	914.9085	12	38	0.0000	15.0915	12.5660	0.0000	0.0000	0.0000
RR_Det3	930.0000	920.0000	915.5121	13	15	0.0000	14.4879	105690.17	0.0000	0.0000	0.0000
RR_Det4	930.0000	915.0000	911.5435	48	0	0.0000	18.4565	213740.76	0.0000	0.0000	0.0000
S19	920.0000	912.0000	909.0723	13	30	0.0000	10.9277	12.5660	0.0000	0.0000	0.0000
Irish_Det0	920.0000	914.0000	909.1591	13	27	0.0000	10.8409	81488.455	0.0000	0.0000	0.0000
D-S_S10	920.0000	915.0000	912.7123	12	58	0.0000	7.2877	12.5660	0.0000	0.0000	0.0000
D-S_S11	930.0000	920.0000	917.4801	12	49	0.0000	12.5199	12.5660	0.0000	0.0000	0.0000
N2	900.0000	894.0000	886.7912	13	50	0.0000	13.2088	12.5660	0.0000	0.0000	0.0000
N3	900.0000	898.0000	890.2036	13	29	0.0000	9.7964	12.5660	0.0000	0.0000	0.0000
N5	910.0000	898.5000	895.3447	13	48	0.0000	14.6553	12.5660	0.0000	0.0000	0.0000
N6	910.0000	899.3000	896.4741	13	46	0.0000	13.5259	12.5660	0.0000	0.0000	0.0000
N7	910.0000	899.6000	896.5196	13	46	0.0000	13.4804	12.5660	0.0000	0.0000	0.0000
N8	910.0000	900.3000	897.7645	13	26	0.0000	12.2355	12.5660	0.0000	0.0000	0.0000

N4	910.0000	893.5000	890.3950	13	29	0.0000	19.6050	12.5660	0.0000	0.0000	0.0000
SwanCk_N	910.0000	898.0000	893.9643	15	41	0.0000	16.0357	119421.83	0.0000	0.0000	0.0000
SwanCk_S	920.0000	899.0000	895.2084	13	26	0.0000	24.7916	42999.993	0.0000	0.0000	0.0000
N10	900.0000	899.9400	894.6732	13	3	0.0000	5.3268	12.5660	0.0000	0.0000	0.0000
N9	900.0000	899.6000	894.0856	13	6	0.0000	5.9144	12.5660	0.0000	0.0000	0.0000
N12	920.0000	912.2000	907.9673	13	18	0.0000	12.0327	12.5660	0.0000	0.0000	0.0000
N11	920.0000	911.2000	905.7840	13	21	0.0000	14.2160	12.5660	0.0000	0.0000	0.0000
N10.1	910.0000	905.0000	899.5837	12	47	0.0000	10.4163	12.5660	0.0000	0.0000	0.0000
D-S_N2	880.0000	873.5000	871.2245	12	48	0.0000	8.7755	12.5660	0.0000	0.0000	0.0000
D-S_N3	910.0000	904.0000	901.6729	12	43	0.0000	8.3271	12.5660	0.0000	0.0000	0.0000
D-S_N8	900.0000	897.0000	894.3686	13	15	0.0000	5.6314	12.5660	0.0000	0.0000	0.0000
D-S_N5	920.0000	911.2000	908.3254	13	7	0.0000	11.6746	12.5660	0.0000	0.0000	0.0000
N13	926.2500	921.8000	916.4998	13	10	0.0000	9.7502	12.5660	0.0000	0.0000	0.0000
N14	926.2500	921.2333	918.7123	13	5	0.0000	7.5377	12.5660	0.0000	0.0000	0.0000
N15	940.0000	930.8000	921.5434	13	6	0.0000	18.4566	12.5660	0.0000	0.0000	0.0000
CrossDetE	960.0000	945.0000	942.0055	13	6	0.0000	17.9945	88856.588	0.0000	0.0000	0.0000
CrossDetW	1010.0000	947.0000	943.6457	12	47	0.0000	66.3543	31372.161	0.0000	0.0000	0.0000
N16	980.0000	950.3000	941.6829	13	6	0.0000	38.3171	12.5660	0.0000	0.0000	0.0000
QuarryHDet	1015.0000	1008.0000	1002.9108	13	5	0.0000	12.0892	29821.939	0.0000	0.0000	0.0000
D-S_N6	950.0000	948.0000	945.0601	12	43	0.0000	4.9399	12.5660	0.0000	0.0000	0.0000
U-S_N1	1015.0000	1009.0000	1006.3467	12	36	0.0000	8.6533	12.5660	0.0000	0.0000	0.0000
N19	1010.0000	1004.5000	1000.9084	13	10	0.0000	9.0916	12.5660	0.0000	0.0000	0.0000
N17	1000.0000	982.0000	977.5838	12	42	0.0000	22.4162	12.5660	0.0000	0.0000	0.0000
U-S_N2	1035.0000	1027.0000	1024.7346	12	33	0.0000	10.2654	12.5660	0.0000	0.0000	0.0000
NobelDrDet	1030.0000	1026.0000	1021.4956	12	35	0.0000	8.5044	6534.0000	0.0000	0.0000	0.0000
N20	1030.0000	1023.0000	1019.9704	12	36	0.0000	10.0296	12.5660	0.0000	0.0000	0.0000
D-S_N7	940.0000	925.8000	922.2066	12	42	0.0000	17.7934	12.5660	0.0000	0.0000	0.0000
D-S_N6.1	955.0000	953.9500	949.1916	12	43	0.0000	5.8084	12.5660	0.0000	0.0000	0.0000
D-S_N2.1	895.0000	889.0000	886.7923	13	50	0.0000	8.2077	12.5660	0.0000	0.0000	0.0000
D-S_N1.1	870.0000	864.0000	861.3167	14	54	0.0000	8.6833	12.5660	0.0000	0.0000	0.0000
N3.1	900.0000	897.7000	890.2223	13	29	0.0000	9.7777	12.5660	0.0000	0.0000	0.0000
SwanCk_C	900.0000	896.0000	892.1382	13	32	0.0000	7.8618	5602.9123	0.0000	0.0000	0.0000
Node36	930.0000	916.0000	912.0000	0	0	0.0000	18.0000	12.5660	0.0000	0.0000	0.0000
McGaw_NW1	1015.0000	1011.0000	1009.4469	12	31	0.0000	5.5531	12.5660	0.0000	0.0000	0.0000
NW1_infil	1015.0000	1010.0000	1007.2453	12	48	0.0000	7.7547	133293.60	0.0000	0.0000	0.0000
NW1_pump	1010.0000	1006.0000	1006.0000	0	0	0.0000	4.0000	12.5660	0.0000	0.0000	0.0000
NW1_det	1010.0000	1001.5000	1003.2697	14	31	1.7697	6.7303	56628.000	0.0000	0.0000	0.0000
Node42	990.0000	981.0000	977.6478	14	33	0.0000	12.3522	12.5660	0.0000	0.0000	0.0000
McGaw_N1	1015.0000	1010.0000	1008.8219	12	35	0.0000	6.1781	12.5660	0.0000	0.0000	0.0000
McGaw_N2	1015.0000	1010.0000	1008.0176	12	35	0.0000	6.9824	12.5660	0.0000	0.0000	0.0000
Node49	1010.0000	948.0000	945.1924	14	13	0.0000	64.8076	12.5660	0.0000	0.0000	0.0000
N1_infil	1015.0000	1009.0000	1006.2188	12	48	0.0000	8.7812	169884.00	0.0000	0.0000	0.0000
N1_det	1010.0000	1000.5000	1002.6618	14	12	2.1618	7.3382	87120.000	0.0000	0.0000	0.0000
N1_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
N2_infil	1015.0000	1009.0000	1006.1060	12	38	0.0000	8.8940	34848.000	0.0000	0.0000	0.0000
N2_det	1010.0000	1000.5000	1002.6721	13	8	2.1721	7.3279	39204.000	0.0000	0.0000	0.0000
N2_pump	1010.0000	1005.0000	1005.0000	0	0	0.0000	5.0000	12.5660	0.0000	0.0000	0.0000
Node49.1	980.0000	945.3000	942.2858	13	8	0.0000	37.7142	12.5660	0.0000	0.0000	0.0000
SW2_det	1010.0000	997.5000	999.1994	14	0	1.6994	10.8006	74052.000	0.0000	0.0000	0.0000
SW2_infil	1010.0000	1006.0000	1003.1265	12	38	0.0000	6.8735	111513.60	0.0000	0.0000	0.0000
SW2_pump	1010.0000	1002.0000	1002.0000	0	0	0.0000	8.0000	12.5660	0.0000	0.0000	0.0000
McGaw_SW2	1010.0000	1007.0000	1005.3959	12	31	0.0000	4.6041	12.5660	0.0000	0.0000	0.0000
Node37.1	1000.0000	985.3000	983.3349	13	5	0.0000	16.6651	12.5660	0.0000	0.0000	0.0000
McGaw_SW1	1015.0000	1013.0000	1010.1397	12	31	0.0000	4.8603	12.5660	0.0000	0.0000	0.0000
SW1_infil	1015.0000	1012.0000	1009.0337	12	35	0.0000	5.9663	15246.000	0.0000	0.0000	0.0000
SW1_det	1015.0000	1003.5000	1005.0861	12	51	1.5861	9.9139	13068.000	0.0000	0.0000	0.0000
SW1_pump	1015.0000	1008.0000	1008.0000	0	0	0.0000	7.0000	12.5660	0.0000	0.0000	0.0000
McGaw_SE2	1015.0000	1010.0000	1008.6891	12	33	0.0000	6.3109	12.5660	0.0000	0.0000	0.0000
SE2_infil	1015.0000	1009.0000	1006.3871	12	39	0.0000	8.6129	85377.600	0.0000	0.0000	0.0000
SE2_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
SE2_det	1015.0000	1000.5000	1002.8140	13	34	2.3140	12.1860	87120.000	0.0000	0.0000	0.0000
Node89	930.0000	917.8000	914.9839	13	35	0.0000	15.0161	12.5660	0.0000	0.0000	0.0000
McGaw_SE1	1015.0000	1009.0000	1006.4121	12	44	0.0000	8.5879	12.5660	0.0000	0.0000	0.0000
SE1_infil	1015.0000	1008.0000	1005.2624	12	47	0.0000	9.7376	5227.2000	0.0000	0.0000	0.0000
SE1_det	1015.0000	999.5000	1001.6486	13	12	2.1486	13.3514	26136.000	0.0000	0.0000	0.0000
SE1_pump	1015.0000	1004.0000	1004.0000	0	0	0.0000	11.0000	12.5660	0.0000	0.0000	0.0000
Node90	1000.0000	893.0000	891.6262	13	58	0.0000	108.3738	12.5660	0.0000	0.0000	0.0000
McGaw_E1	1015.0000	1009.0000	1007.1670	12	33	0.0000	7.8330	12.5660	0.0000	0.0000	0.0000
E1_infil	1015.0000	1008.0000	1005.1605	12	37	0.0000	9.8395	47044.800	0.0000	0.0000	0.0000
E1_pump	1010.0000	1004.0000	1004.0000	0	0	0.0000	6.0000	12.5660	0.0000	0.0000	0.0000
E1_det	1010.0000	999.5000	1001.2237	13	29	1.7237	8.7763	65340.000	0.0000	0.0000	0.0000
Node51.1	910.0000	885.0000	885.3779	14	37	0.3779	24.6221	12.5660	0.0000	0.0000	0.0000
NE1_infil	1015.0000	1009.0000	1006.2102	12	37	0.0000	8.7898	30927.600	0.0000	0.0000	0.0000
NE1_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
NE1_det	1015.0000	1000.5000	1001.6802	13	43	1.1802	13.3198	43560.000	0.0000	0.0000	0.0000
Node51.2	900.0000	873.3000	870.9856	14	46	0.0000	29.0144	12.5660	0.0000	0.0000	0.0000
McGaw_NE3	1015.0000	1010.0000	1008.4195	12	33	0.0000	6.5805	12.5660	0.0000	0.0000	0.0000
McGaw_NE2	1015.0000	1010.0000	1008.1297	12	33	0.0000	6.8703	12.5660	0.0000	0.0000	0.0000
Node50	910.0000	901.3000	898.2044	13	25	0.0000	11.7956	12.5660	0.0000	0.0000	0.0000
NE3_infil	1015.0000	1009.0000	1006.3007	12	37	0.0000	8.6993	48787.200	0.0000	0.0000	0.0000

NE3_det	1010.0000	1000.5000	1002.5249	13	24	2.0249	7.4751	78408.000	0.0000	0.0000	0.0000
NE3_pump	1015.0000	1005.0000	1005.0000	0	0	0.0000	10.0000	12.5660	0.0000	0.0000	0.0000
NE2_det	1010.0000	1000.5000	1001.9624	14	18	1.4624	8.0376	69696.000	0.0000	0.0000	0.0000
NE2_pump	1010.0000	1005.0000	1005.0000	0	0	0.0000	5.0000	12.5660	0.0000	0.0000	0.0000
NE2_infil	1010.0000	1009.0000	1006.3845	12	48	0.0000	3.6155	64468.800	0.0000	0.0000	0.0000
Node87	910.0000	900.6000	897.1987	14	18	0.0000	12.8013	12.5660	0.0000	0.0000	0.0000
Node91	1000.0000	984.2000	981.6992	12	53	0.0000	18.3008	12.5660	0.0000	0.0000	0.0000

Table E10 - CONDUIT SUMMARY STATISTICS

Note: The peak flow may be less than the design flow and the conduit may still surcharge because of the downstream boundary conditions.

* denotes an open conduit that has been overtopped this is a potential source of severe errors

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Ends Upstream (ft)	Maximum Depth at Pipe Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS	
N_Link2	768.8495	2.5628	120.0000	116.2273	14	23	2.7343	13	56	0.1512	871.1359	870.2724	.3136	.2472	
N_Link1	1746.275	5.8209	120.0000	129.6413	14	29	2.2036	13	7	0.0742	870.2432	869.9937	.3743	.4994	
M_Link3	1360.783	4.5359	120.0000	285.3113	14	39	2.5959	14	31	0.2097	869.9937	868.7238	.4994	.5724	
M_Link2	754.4772	2.5149	120.0000	288.7937	14	46	2.5187	14	38	0.3828	868.4219	866.4043	.5922	.4904	
M_Link1	1332.969	4.4432	120.0000	288.2830	14	52	3.9361	14	51	0.2163	866.1792	861.3166	.5179	.2317	
M_Link0	2772.126	9.2404	120.0000	289.0619	14	54	6.0529	14	54	0.1043	861.3698	859.4840	.3370	.2484	
Runoff_N1	397.6640	4.9708	48.0000	53.0931	13	7	3.5093	13	0	0.1335	870.6349	870.2724	.4587	.6181	
Runoff_M2	397.6640	4.9708	48.0000	27.5192	12	47	2.1449	12	37	0.0692	868.7240	868.7238	1.181	1.431	*
S_Link5	924.5090	11.5564	48.0000	23.5727	13	33	1.2583	12	39	0.0255	913.1541	891.6247	.1885	.9062	
S_Link4	14789.99	7.3898	128.4000	197.6596	13	24	2.0570	12	38	0.0134	891.6247	885.3775	.3388	.5026	
S_Link3	31616.76	5.6502	204.0000	153.0274	14	35	2.2663	13	45	0.0048	885.3775	881.0371	.3163	.3139	
S_Link2	5144.586	4.2842	138.0000	155.3457	14	47	3.7140	14	47	0.0302	881.0371	870.9848	.4641	.2335	
S_Link1	2559.189	8.5306	120.0000	158.6578	14	51	2.4209	15	21	0.0620	870.5780	869.9937	.2578	.4994	
S_Link6	17774.31	8.8809	128.4000	129.1600	13	42	2.0275	12	26	0.0073	910.8320	891.6247	.3114	.3388	
Runoff_S1	397.6640	4.9708	48.0000	25.8843	12	41	1.1702	12	28	0.0651	881.0373	881.0371	1.084	1.334	*
Runoff_S2	397.6640	4.9708	48.0000	43.3643	12	45	1.8192	12	39	0.1090	891.6264	891.6247	.6566	.9062	
Runoff_S3	397.6640	4.9708	48.0000	14.5925	12	44	1.7100	12	37	0.0367	910.8328	910.8320	.4582	.7080	
S_Link10	2845.702	9.4857	120.0000	120.2044	13	24	4.0547	13	24	0.0422	939.6903	930.0932	.2090	.2093	
S_Link9	3117.276	10.3909	120.0000	131.9898	13	25	3.8347	13	20	0.0423	930.0932	920.8430	.2093	.2643	
S_Link8	2222.646	7.4088	120.0000	131.8912	13	28	3.2974	13	20	0.0593	920.1056	917.8988	.2406	.2899	
S_Link7	2600.485	8.6683	120.0000	131.5340	13	31	3.4565	13	28	0.0506	916.9050	910.8320	.2305	.2832	
Runoff_S4	397.6640	4.9708	48.0000	14.1359	13	7	1.8309	12	44	0.0355	930.1415	930.0932	.2854	.5233	
S_Link12	927.9977	11.6000	48.0000	18.5977	12	58	2.5030	12	40	0.0200	978.4670	953.6026	.1668	.4006	
S_Link11	1127.020	14.0877	48.0000	137.6093	13	7	4.2331	12	41	0.1221	953.6026	944.9303	.4006	1.232	*
S_Link14	527.8312	6.5979	48.0000	84.7353	13	6	4.1935	13	6	0.1605	983.0585	973.4637	.5146	.3659	
S_Link13	834.3540	10.4294	48.0000	83.6944	13	10	5.4584	13	14	0.1003	973.4637	953.6026	.3659	.4006	
Runoff_S6	397.6640	4.9708	48.0000	31.2504	12	51	2.0448	12	41	0.0786	983.3059	983.0585	.3265	.5146	
Runoff_S5	397.6640	4.9708	48.0000	45.0936	12	54	3.0051	12	49	0.1134	954.5802	953.6026	.3950	.4006	
Runoff_S8	397.6640	4.9708	48.0000	20.3062	13	13	1.7385	2	1	0.0511	983.1849	983.0585	.2962	.5146	
Runoff_S7	397.6640	4.9708	48.0000	35.0768	13	1	1.3618	2	15	0.0882	983.3824	983.3331	.5206	.7583	
Runoff_S9	397.6640	4.9708	48.0000	13.1023	12	43	1.0002	12	33	0.0329	981.7055	981.6915	.3764	.6229	
Runoff_US1	397.6640	4.9708	48.0000	17.5648	12	39	2.4583	12	39	0.0442	914.9085	913.4675	.2771	.1669	
S_Link15	549.9294	6.8741	48.0000	28.5852	13	30	0.9262	13	24	0.0520	909.0723	891.6247	.2681	.9062	
S_link16	539.1589	6.7395	48.0000	0.0000	0	0	0.0000	0	0	0.0000	912.0000	909.1591	.0000	.0000	
Runoff_S10	397.6640	4.9708	48.0000	48.0412	12	59	3.2859	12	59	0.1208	912.7123	911.1420	.4281	.2855	
Runoff_S11	397.6640	4.9708	48.0000	27.4728	12	49	3.7422	1	52	0.0691	917.4801	915.5121	.3700	.1280	
N_Link6	741.0031	9.2625	48.0000	19.8644	13	46	2.3631	13	11	0.0268	896.5196	896.4741	.2299	.2935	
N_Link5	621.1634	7.7645	48.0000	19.8569	13	48	3.1195	13	15	0.0320	895.3447	890.2035	.2112	.5509	
N_Link3	1899.861	6.3329	120.0000	120.9504	14	59	3.0562	13	57	0.0637	886.7912	871.1778	.2791	.2678	
N_Link7	1814.427	7.5601	72.0000	32.2081	13	6	1.4594	13	0	0.0178	894.0856	893.9643	.0809	.3274	
N_Link9	4565.759	10.1461	72.0000	102.7438	13	21	1.2141	13	0	0.0225	905.7840	895.2084	.0973	.3681	
N_Link8	1876.839	7.8202	72.0000	41.4498	12	53	1.8625	12	53	0.0221	899.5837	894.6732	.0973	.1222	
Runoff_N2	397.6640	4.9708	48.0000	48.8463	12	48	3.3017	12	48	0.1228	871.2245	871.1778	.4311	.6695	
Runoff_N3	397.6640	4.9708	48.0000	37.7361	12	43	3.3177	12	43	0.0949	901.6729	899.5836	.4182	.1459	
Runoff_N8	397.6640	4.9708	48.0000	30.9534	13	27	3.6975	2	0	0.0778	894.3686	893.9643	.3422	.4911	
Runoff_N5	397.6640	4.9708	48.0000	22.8534	13	7	2.3454	12	48	0.0575	908.3254	907.9673	.2814	.4418	
NonameRd	330.4296	16.5215	48.0000	32.2380	12	44	9.8231	12	44	0.0976	943.6457	942.0055	.1614	.2514	
N_Link11.1	135.9893	11.3324	36.0000	32.6893	13	5	6.9582	13	4	0.2404	942.0055	941.6829	.3352	.4610	
N_Link11	6060.385	20.2013	120.0000	82.6929	13	6	6.1018	13	6	0.0136	941.6829	921.5434	.1383	.0743	
LacyRd_N3b	1010.039	34.2386	58.0000	42.1309	13	6	5.4068	13	10	0.0417	921.5434	918.7123	.1538	.4784	
LacyRd_N3a	99.7666	6.2729	54.0000	28.1054	13	7	5.3721	13	8	0.2817	918.7123	916.4998	.5138	.1555	
N_Link10	2664.101	8.8803	72.0000	84.0500	13	10	1.7362	13	0	0.0315	916.4998	907.9673	.1166	.2946	
Runoff_N6	397.6640	4.9708	48.0000	15.9514	12	44	3.7284	1	52	0.0401	945.0601	943.6457	.2650	.1614	
Roff_US_N1	397.6640	4.9708	48.0000	27.3638	12	36	2.7986	12	36	0.0688	1006.347	1004.849	.3367	.2122	
N_Link14	882.1389	11.0267	48.0000	6.9833	13	10	1.0848	13	15	0.0079	1000.908	977.5838	.1021	.3960	
Roff_US_N2	397.6640	4.9708	48.0000	49.5228	12	33	3.3148	12	33	0.1245	1024.735	1023.159	.4336	.2898	
N_Link16	1152.523	14.4065	48.0000	48.7891	12	36	4.8236	12	24	0.0423	1019.970	977.5838	.2426	.3960	

Runoff_N7	397.6640	4.9708	48.0000	3.1221	12	42	1.6974	1	54	0.0079	922.2066	921.5434	.1017	.1858	
N_Link12	5261.284	12.1236	72.0000	44.1745	12	42	4.5558	12	42	0.0084	977.5838	949.1916	.2640	.2069	
N_Link12.1	1336.358	4.1595	36.0000	81.5231	12	43	3.5999	1	51	0.0610	949.1916	943.6457	.4139	.2152	
Runoff_N2.	397.6640	4.9708	48.0000	16.0541	12	33	2.3190	12	27	0.0404	886.7923	886.7912	.4481	.6978	
Runoff_N1.	397.6640	4.9708	48.0000	7.1494	12	47	1.9251	12	47	0.0180	861.3167	861.3166	.3292	.5791	
N_Link4	2433.847	8.1128	120.0000	132.1679	13	35	3.8198	13	29	0.0543	890.2223	886.7912	.2522	.2791	
RR_br	3495.292	17.4765	120.0000	159.6465	13	34	3.5952	13	35	0.0457	890.2035	890.2223	.2204	.2522	
Link120	397.6640	4.9708	48.0000	98.2467	12	32	4.6716	12	22	0.2471	1009.447	1007.245	.6117	.3113	
N_Combine	397.6640	4.9708	48.0000	17.1786	14	13	2.5651	14	13	0.0432	945.1924	943.6457	.2981	.1614	
Link124	397.6640	4.9708	48.0000	140.0877	12	36	5.3068	12	29	0.3523	1008.822	1006.219	.7055	.3047	
Link128	397.6640	4.9708	48.0000	65.7069	12	35	3.7501	12	34	0.1652	1008.018	1006.106	.5044	.2765	
N_Combine.	397.6640	4.9708	48.0000	17.3820	13	8	1.7036	13	13	0.0437	942.2858	941.6829	.2464	.3457	
Link156	397.6640	4.9708	48.0000	94.7061	12	32	4.4877	12	15	0.2382	1005.396	1003.127	.5990	.2816	
Link160	397.6640	4.9708	48.0000	22.1559	12	32	3.5566	1	48	0.0557	1010.140	1009.034	.2849	.2584	
Link152	397.6640	4.9708	48.0000	128.8402	12	34	4.6987	12	33	0.3240	1008.689	1006.387	.6723	.3468	
SE2_Link	397.6640	4.9708	48.0000	20.3620	13	35	2.5684	13	35	0.0512	914.9839	913.5223	.2960	.1806	
Link148	397.6640	4.9708	48.0000	34.9595	12	45	2.7789	12	44	0.0879	1006.412	1005.262	.3530	.3156	
Link144	397.6640	4.9708	48.0000	77.1972	12	33	3.9620	12	33	0.1941	1007.167	1005.161	.5417	.2901	
Link140	397.6640	4.9708	48.0000	39.4486	12	32	3.5717	1	48	0.0992	1007.556	1006.210	.3890	.3025	
Link132	397.6640	4.9708	48.0000	100.9426	12	33	4.3032	12	33	0.2538	1008.420	1006.301	.6049	.3252	
Link136	397.6640	4.9708	48.0000	74.1251	12	35	3.9324	12	30	0.1864	1008.130	1006.384	.5324	.3461	
Link166	397.6640	4.9708	48.0000	10.4136	14	31	1.5103	14	51	0.0262	977.6478	977.5838	.1619	.3960	
Link167	397.6640	4.9708	48.0000	14.5857	13	25	1.4818	12	45	0.0367	898.2044	897.7645	.2261	.3661	
Link169	397.6640	4.9708	48.0000	6.4659	14	18	1.3226	15	11	0.0163	897.1987	896.5196	.1497	.2299	
Link170	397.6640	4.9708	48.0000	3.7610	13	36	0.7664	13	19	0.0095	870.9856	870.9848	.4214	.6712	
Link171	397.6640	4.9708	48.0000	9.9881	13	24	0.2595	12	58	0.0251	885.3779	885.3775	1.094	1.344	*
Link172	397.6640	4.9708	48.0000	16.5617	13	13	0.4262	13	5	0.0416	891.6262	891.6247	.6566	.9062	
Link174	397.6640	4.9708	48.0000	8.2769	12	57	0.6984	13	52	0.0208	981.6992	981.6915	.3748	.6229	
Link175	397.6640	4.9708	48.0000	9.6279	13	53	0.5877	15	19	0.0242	983.3349	983.3331	.5087	.7583	
USH14_NCul	480.7420	5.7231	72.0000	58.2287	14	22	1.3709	14	15	0.1211	871.1778	871.1359	.4963	.5227	
LacyN1_Cul	1194.894	16.5957	72.0000	65.0895	14	26	2.3448	12	49	0.0545	870.2724	870.2432	.4121	.6239	
280.1	172.5733	4.7937	72.0000	198.2183	13	57	6.6233	13	55	1.1486	868.7238	868.4219	.9540	.9870	
Lacy_MCulv	919.4830	9.2877	66.0000	288.3237	14	50	3.1861	14	49	0.3136	866.4043	866.1792	.8917	.9417	
284.1	2000.067	14.6525	78.0000	289.0620	14	53	4.9327	14	53	0.1445	861.3166	861.3698	.3564	.5184	
USH14_SCul	293.0837	6.1059	72.0000	79.2688	14	49	3.7708	15	6	0.2705	870.9848	870.5780	.4475	.4297	
EHill_Culv	255.7928	13.0274	60.0000	120.0913	13	22	8.4276	13	22	0.4695	944.9303	939.6903	.9861	.4181	
SyeneS1Cul	125.3272	7.0806	45.0000	131.8103	13	27	9.6204	13	28	1.0517	920.8430	920.1056	.7048	.6415	
Irish1Culv	83.8758	5.5917	36.0000	65.8314	13	30	5.0060	13	28	0.7849	917.8988	916.9050	.9663	.7683	
Irish2Culv	33.9380	6.9138	30.0000	18.6423	12	56	5.9334	12	58	0.5493	981.6915	978.4670	.9966	.2668	
Irish3Culv	92.2134	5.7633	24.0000	-40.6073	13	7	-2.5080	13	8	-0.4404	983.3331	983.0585	1.166	1.379	
RR_S3Culv	256.8162	17.1211	60.0000	16.0451	13	39	8.2629	13	24	0.0625	915.5121	911.5435	.1024	.3087	
Irish0Culv	1.9395	0.0000	24.0000	14.7371	13	17	1.5953	13	4	7.5983	909.1591	909.0723	.8296	.7862	
SyeneN1_Cu	45.5304	6.5043	31.0000	14.5838	13	26	4.0347	13	11	0.3203	897.7645	896.5196	.5669	.3560	
LacyN2_Cul	41.4675	5.9239	31.0000	19.8647	13	47	6.5038	13	47	0.4790	896.4741	895.3447	.4545	.3270	
SyeneN2_Cu	259.2403	7.8124	78.0000	52.5171	13	33	2.7537	13	37	0.2026	890.3950	890.2035	.5223	.6467	
SyeneN1_C	253.8520	7.9329	48.0000	16.2282	13	4	3.2239	13	4	0.0639	894.6732	894.1122	.1833	.1256	
JonesFrm_C	443.6945	13.8655	48.0000	51.6175	13	18	6.3733	13	0	0.1163	907.9673	905.7840	.4418	.1460	
592.1	21.8107	12.3423	18.0000	33.7122	12	35	22.2300	12	34	1.5457	1021.496	1019.970	1.330	.6470	
SwnCrNout	0.0000	0.0000	48.0000	10.1015	15	41	5.5507	15	41	0.0000	893.9643	892.1382	.4911	.0346	
SwnCkSout	0.0000	0.0000	36.0000	7.0000	13	12	4.0000	13	12	0.0000	895.2084	892.1382	.7361	-.287	
NW1_vweir	0.0000	0.0000	0.0000	10.4150	14	31	5.8853	14	31	0.0000	977.0000	977.0000	.0000	.0000	
N1_vweir	0.0000	0.0000	0.0000	17.1779	14	12	7.9462	14	12	0.0000	944.0000	944.0000	.0000	.0000	
N2_vweir	0.0000	0.0000	0.0000	17.3832	13	8	8.0030	13	8	0.0000	941.3000	941.3000	.0000	.0000	
SW2_vweir	0.0000	0.0000	0.0000	9.4117	14	0	5.5383	14	0	0.0000	981.3000	981.3000	.0000	.0000	
SW1_vweir	0.0000	0.0000	0.0000	7.9205	12	51	4.9937	12	51	0.0000	980.2000	980.2000	.0000	.0000	
SE2_vweir	0.0000	0.0000	0.0000	20.3630	13	34	8.8000	13	34	0.0000	913.8000	913.8000	.0000	.0000	
SE1_vweir	0.0000	0.0000	0.0000	16.9176	13	12	7.8737	13	12	0.0000	889.0000	889.0000	.0000	.0000	
E1_vweir	0.0000	0.0000	0.0000	9.7515	13	29	5.6574	13	29	0.0000	881.0000	881.0000	.0000	.0000	
NE1_vweir	0.0000	0.0000	0.0000	3.7828	13	43	3.2053	13	43	0.0000	869.3000	869.3000	.0000	.0000	
NE3_vweir	0.0000	0.0000	0.0000	14.5862	13	24	7.2035	13	24	0.0000	897.3000	897.3000	.0000	.0000	
NE2_vweir	0.0000	0.0000	0.0000	6.4660	14	18	4.4214	14	18	0.0000	896.6000	896.6000	.0000	.0000	
1.25in	0.0221	0.8025	1.2498	0.1074	12	42	11.8479	12	41	4.8673	1002.911	1000.908	23.15	4.017	
3.25in	0.2405	0.8025	3.2497	0.5027	13	6	8.6001	13	6	2.0897	1002.911	1001.761	5.209	1.000	
USH14_NOvr	Undefnd	Undefnd	Undefn	0.0000	0	0									
LacyN1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
PrivateDr	Undefnd	Undefnd	Undefn	150.0761	14	45									
Lacy_MOvr	Undefnd	Undefnd	Undefn	0.0000	0	0									
MM_ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
USH14_SOvr	Undefnd	Undefnd	Undefn	0.0000	0	0									
EHill_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0									
SyeneS1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
irish1_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0									
Irish2Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
Irish3Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
RR_S3_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
irish0_Ovr.1	Undefnd	Undefnd	Undefn	0.0000	0	0									
SyeneN1_Ov	Undefnd	Undefnd	Undefn	0.0000	0	0									
LacyN2_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0									
SyeneN2_Ov	Undefnd	Undefnd	Undefn	0.0000	0	0									
SyeneN1_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0									

JonesFrm_O	Undefnd	Undefnd	Undefn	0.0000	0	0
Lacy_N3_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0
StandPipe	Undefnd	Undefnd	Undefn	6.4492	13	5
QuarryOvr	Undefnd	Undefnd	Undefn	0.0000	0	0
NobelWeir	Undefnd	Undefnd	Undefn	15.4195	12	35
SwnCrWeirN	Undefnd	Undefnd	Undefn	0.0000	0	0
SwanCkSout.1	Undefnd	Undefnd	Undefn	94.1897	13	26
Weir10	Undefnd	Undefnd	Undefn	103.1808	13	32
weir11	Undefnd	Undefnd	Undefn	0.1696	13	32
weir14	Undefnd	Undefnd	Undefn	0.0000	0	0
weirtop	Undefnd	Undefnd	Undefn	0.0000	0	0
RR_S4out	Undefnd	Undefnd	Undefn	0.0000	0	0
NW1_Iweir	Undefnd	Undefnd	Undefn	33.4575	12	48
NW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
N1_Iweir	Undefnd	Undefnd	Undefn	79.2281	12	48
N1_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0
N2_Iweir	Undefnd	Undefnd	Undefn	61.3267	12	38
N2_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0
SW2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
SW2_Iweir	Undefnd	Undefnd	Undefn	64.4669	12	38
SW1_Iweir	Undefnd	Undefnd	Undefn	20.2729	12	35
SW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
SE2_Iweir	Undefnd	Undefnd	Undefn	108.6113	12	39
SE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
SE1_Iweir	Undefnd	Undefnd	Undefn	34.6140	12	47
SE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
E1_Iweir	Undefnd	Undefnd	Undefn	69.7913	12	37
E1_ovrweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NE1_Iweir	Undefnd	Undefnd	Undefn	31.1214	12	37
NE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NE3_Iweir	Undefnd	Undefnd	Undefn	93.1402	12	37
NE2_Iweir	Undefnd	Undefnd	Undefn	43.2550	12	48
NE3_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0
NW1_inf	Undefnd	Undefnd	Undefn	1.5300	6	35
N1_inf	Undefnd	Undefnd	Undefn	1.9500	5	36
N2_inf	Undefnd	Undefnd	Undefn	1.3040	7	38
SW2_inf	Undefnd	Undefnd	Undefn	1.2800	5	43
SW1_inf	Undefnd	Undefnd	Undefn	0.5700	8	41
SE2_inf	Undefnd	Undefnd	Undefn	0.9800	4	4
SE1_inf	Undefnd	Undefnd	Undefn	0.0600	2	52
E1_inf	Undefnd	Undefnd	Undefn	1.7600	8	39
NE1_inf	Undefnd	Undefnd	Undefn	1.1600	8	49
NE3_inf	Undefnd	Undefnd	Undefn	1.8300	6	50
NE2_inf	Undefnd	Undefnd	Undefn	2.4100	9	4
FREE # 1	Undefnd	Undefnd	Undefn	289.0619	14	54

Table E11. Area assumptions used in the analysis
Subcritical and Critical flow assumptions from Subroutine Head. See Figure 17-1 in the manual for further information.

Conduit Name	Duration of Dry Flow(min)	Duration of Sub-Critical Flow(min)	Durat. of Upstream Critical Flow(min)	Durat. of Downstream Critical Flow(min)	Maximum Hydraulic Radius-m	Maximum X-Sect Area(ft^2)	Maximum Vel*D (ft^2/s)
N_Link2	296.6667	2583.3333	0.0000	0.0000	1.9558	44.6134	7.3031
N_Link1	151.0000	2729.0000	0.0000	0.0000	2.7352	80.8998	7.0159
M_Link3	241.3333	2638.6667	0.0000	0.0000	3.2494	110.1161	13.8859
M_Link2	328.3333	2551.6667	0.0000	0.0000	3.3187	114.8347	13.6118
M_Link1	488.0000	2392.0000	0.0000	0.0000	2.4979	73.2452	14.7509
M_Link0	147.6667	2732.3333	0.0000	0.0000	2.0301	47.7562	17.7161
Runoff_N1	181.1667	2698.8333	0.0000	0.0000	1.1377	23.7054	5.0254
Runoff_M2	728.1619	2151.8381	0.0000	0.0000	2.1630	80.0000	2.6797
S_Link5	424.3333	2455.6667	0.0000	0.0000	1.1685	32.9529	1.8637
S_Link4	135.3333	2744.6667	0.0000	0.0000	1.1920	206.4860	7.4020
S_Link3	144.2222	2735.7778	0.0000	0.0000	1.4604	87.0291	10.8060
S_Link2	152.6667	2727.3333	0.0000	0.0000	1.6017	41.8272	14.8963
S_Link1	206.3333	2673.6667	0.0000	0.0000	2.3872	66.3969	9.0577
S_Link6	112.3333	2767.6667	0.0000	0.0000	0.7833	72.8078	6.4530
Runoff_S1	1499.5791	1380.4209	0.0000	0.0000	2.1630	80.0000	1.9536
Runoff_S2	120.3333	2759.6667	0.0000	0.0000	1.7070	51.1263	3.5387
Runoff_S3	112.3333	1285.5667	0.0000	1482.1000	1.3117	30.9555	1.7598
S_Link10	216.0000	2664.0000	0.0000	0.0000	1.5322	29.6471	8.4765
S_Link9	136.6667	2743.3333	0.0000	0.0000	1.6765	34.5033	9.0581
S_Link8	189.2857	2690.7143	0.0000	0.0000	1.8403	40.1640	8.7036

S_Link7	260.3333	1254.4333	0.0000	1365.2333	1.7871	38.2781	8.7952
Runoff_S4	194.6667	2685.3333	0.0000	0.0000	0.9490	17.0282	1.5672
S_Link12	732.6000	2147.4000	0.0000	0.0000	0.6857	9.7931	2.2392
S_Link11	115.6667	2764.3333	0.0000	0.0000	1.5064	45.1756	9.4516
S_Link14	146.6667	2733.3333	0.0000	0.0000	1.0604	20.2072	7.3526
S_Link13	237.9744	2642.0256	0.0000	0.0000	0.9290	15.4150	8.3202
Runoff_S6	838.1555	2041.8445	0.0000	0.0000	0.9809	17.7120	3.0475
Runoff_S5	241.4286	2638.5714	0.0000	0.0000	0.9351	15.5881	4.4514
Runoff_S8	159.6111	2720.3889	0.0000	0.0000	0.9530	17.0002	1.9768
Runoff_S7	181.9444	2698.0556	0.0000	0.0000	1.4259	36.1392	2.4922
Runoff_S9	715.6825	2164.3175	0.0000	0.0000	1.1432	23.9457	1.2286
Runoff_US1	117.6667	172.3217	0.0000	2590.0117	0.6021	7.1452	2.1829
S_Link15	753.9167	2126.0833	0.0000	0.0000	1.2567	34.6445	2.0274
S_link16	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Runoff_S10	118.3333	0.0000	0.0000	2761.6667	0.8920	14.6204	4.6895
Runoff_S11	1404.4242	1475.5758	0.0000	0.0000	0.6380	9.0716	2.8424
N_Link6	732.6167	2147.3833	0.0000	0.0000	0.6711	8.4783	2.4527
N_Link5	744.2667	2106.0500	0.0000	29.6833	0.8807	16.0357	2.5391
N_Link3	117.0000	2131.6750	0.0000	631.3250	1.8284	39.5980	7.9131
N_Link7	634.3611	2245.6389	0.0000	0.0000	1.0023	43.3963	0.8204
N_Link9	148.0000	2732.0000	0.0000	0.0000	1.2534	98.5113	1.4543
N_Link8	135.3333	2744.6667	0.0000	0.0000	0.5419	22.2873	1.0456
Runoff_N2	134.5000	2096.9417	0.0000	648.5583	1.2360	27.6847	4.7471
Runoff_N3	323.2381	2556.7619	0.0000	0.0000	0.7356	11.3785	3.6912
Runoff_N8	120.3333	2759.6667	0.0000	0.0000	0.8746	14.7961	3.3866
Runoff_N5	181.6111	2698.3889	0.0000	0.0000	0.8632	13.8796	2.5792
NonameRd	140.2222	2739.7778	0.0000	0.0000	0.5738	3.7718	6.4343
N_Link11.1	207.3000	2672.7000	0.0000	0.0000	0.7359	4.7011	8.3034
N_Link11	251.3077	2628.6923	0.0000	0.0000	0.8883	13.5523	6.4870
LacyRd_N3b	136.3333	2743.6667	0.0000	0.0000	0.8968	7.8032	8.2505
LacyRd_N3a	138.6667	2741.3333	0.0000	0.0000	0.8225	5.2344	8.0805
N_Link10	328.9804	2551.0196	0.0000	0.0000	1.1123	58.7470	1.7539
Runoff_N6	292.4762	2587.5238	0.0000	0.0000	0.5804	6.6855	2.0258
Roff_US_N1	109.6667	0.0000	0.0000	2770.3333	0.7171	9.7778	3.0720
N_Link14	403.0926	2476.9074	0.0000	0.0000	0.5509	7.7086	0.9061
Roff_US_N2	109.3333	0.0000	0.0000	2770.6667	0.9024	14.9402	4.7957
N_Link16	125.0000	2755.0000	0.0000	0.0000	0.7760	11.4037	5.4636
Runoff_N7	295.4286	2584.5714	0.0000	0.0000	0.3652	3.1327	0.5385
N_Link12	183.6190	2696.3810	0.0000	0.0000	0.6256	9.6964	6.4343
N_Link12.1	111.0000	2769.0000	0.0000	0.0000	0.5034	39.8639	1.9207
Runoff_N2.	109.7000	2770.3000	0.0000	0.0000	1.2913	30.0574	2.0639
Runoff_N1.	209.6494	2670.3506	0.0000	0.0000	1.0503	20.5408	0.9997
N_Link4	454.8167	2425.1833	0.0000	0.0000	1.7649	37.4949	8.9242
RR_br	454.3667	2425.6333	0.0000	0.0000	1.8879	46.5924	7.9650
Link120	108.6667	2771.3333	0.0000	0.0000	1.0707	22.2307	7.6565
N_Combine	745.8167	2134.1833	0.0000	0.0000	0.5485	6.6986	2.0175
Link124	109.3333	2770.6667	0.0000	0.0000	1.1846	27.7195	9.8382
Link128	109.3333	2770.6667	0.0000	0.0000	0.9661	17.5268	5.8357
N_Combine.	729.3063	2150.6937	0.0000	0.0000	0.7400	10.2359	2.0114
Link156	108.3333	2771.6667	0.0000	0.0000	1.0642	21.8741	7.5006
Link160	108.6667	2771.3333	0.0000	0.0000	0.7001	9.0922	2.6361
Link152	108.6667	2771.3333	0.0000	0.0000	1.2100	27.4807	9.4566
SE2_Link	703.0000	10.3333	0.0000	2166.6667	0.6382	7.9278	2.4481
Link148	112.6667	2767.3333	0.0000	0.0000	0.8345	12.5990	3.7038
Link144	108.6667	2771.3333	0.0000	0.0000	1.0186	19.4880	6.5494
Link140	108.6667	2771.3333	0.0000	0.0000	0.8479	13.1062	4.0650
Link132	108.6667	2771.3333	0.0000	0.0000	1.1216	23.4612	7.9606
Link136	109.3333	2770.6667	0.0000	0.0000	1.0183	19.1529	6.3821
Link166	741.8583	2138.1417	0.0000	0.0000	0.6000	8.0352	1.3669
Link167	716.2929	2163.7071	0.0000	0.0000	0.7348	10.2853	1.6798
Link169	748.1667	2131.8333	0.0000	0.0000	0.5050	5.1973	0.9415
Link170	739.6000	2140.4000	0.0000	0.0000	1.2376	27.7658	0.5277
Link171	735.3167	2144.6833	0.0000	0.0000	2.1630	80.0000	0.5458
Link172	469.6500	2410.3500	0.0000	0.0000	1.7069	51.1240	1.1243
Link174	735.1500	2144.8500	0.0000	0.0000	1.1414	23.8914	0.7132
Link175	738.9000	2141.1000	0.0000	0.0000	1.4127	35.6025	0.8768
USH14_NCul	219.3333	2660.6667	0.0000	0.0000	2.1236	42.6856	4.1699
LacyN1_Cul	151.0000	2729.0000	0.0000	0.0000	2.0003	36.5314	5.5381
280.1	310.6667	2569.3333	0.0000	0.0000	1.9277	34.8773	32.9500
Lacy_MCulv	441.0000	2439.0000	0.0000	0.0000	3.1235	90.5039	16.0618
284.1	132.5000	2747.5000	0.0000	0.0000	2.1918	58.6014	14.0246
USH14_SCul	160.1667	2719.8333	0.0000	0.0000	1.5890	21.0936	9.8883
EHill_Culv	158.3333	2721.6667	0.0000	0.0000	1.2948	14.2498	29.5827
SyeneS1Cul	185.2857	2694.7143	0.0000	0.0000	1.3424	13.7022	24.2824
Irish1Culv	247.0000	2633.0000	0.0000	0.0000	1.2426	13.1565	13.0171
Irish2Culv	140.2222	2739.7778	0.0000	0.0000	0.5832	3.1665	9.2707
Irish3Culv	146.5556	2733.4444	0.0000	0.0000	1.0658	16.2304	6.3655
RR_S3Culv	157.9167	2722.0833	0.0000	0.0000	0.4454	2.1015	5.5385
Irish0Culv	117.6667	2762.3333	0.0000	0.0000	1.0517	9.7189	2.4489
SyeneN1_Cu	729.3063	2150.6937	0.0000	0.0000	0.7578	3.6818	4.6846

LacyN2_Cul	737.9833	2142.0167	0.0000	0.0000	0.6876	3.0545	6.5640
SyeneN2_Cu	195.3333	2684.6667	0.0000	0.0000	1.7565	19.8269	10.0832
SyeneN1_C	490.6667	849.5872	0.0000	1539.7461	0.5416	5.0339	1.9913
JonesFrm_C	134.1667	2745.8333	0.0000	0.0000	0.9030	9.8729	6.1421
592.1	124.0000	2756.0000	0.0000	0.0000	0.4140	1.5180	32.9361
SwnCrNout	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE2_vweir	2880.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	136.1667	2743.8333	0.0000	0.0000	0.0286	0.0093	16.0171
3.25in	734.3583	0.0000	0.0000	2145.6417	0.0807	0.0584	7.2311

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| User defined weir submergence information |
| Average Weir Submergence Constant and Weir Head |
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Weir Name	Mean Constant	Mean Weir Head
NW1_vweir	0.72487	0.64075
N1_vweir	0.72482	0.79809
N2_vweir	0.74237	0.59531
SW2_vweir	0.72968	0.66563
SW1_vweir	0.73119	0.33080
SE2_vweir	0.76715	0.87120
SE1_vweir	0.90328	0.64648
E1_vweir	0.73284	0.61429
NE1_vweir	0.72846	0.42645
NE3_vweir	0.75316	0.72198
NE2_vweir	0.72203	0.54621

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| Table E12. Mean Conduit Flow Information |
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Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
N_Link2	16.9778	2933760.2	0.0004	0.9586	0.4866	0.6725	11.9910	0.0500
N_Link1	19.5685	3381443.8	0.0005	0.9953	0.2059	0.9763	20.6432	0.0500
M_Link3	38.6516	6678992.4	0.0009	0.9777	0.2229	1.2374	30.1452	0.0500
M_Link2	39.6585	6852986.2	0.0010	0.9460	0.2123	1.2902	32.1241	0.0500
M_Link1	39.6117	6844907.6	0.0010	0.8741	0.3956	0.9290	20.7288	0.0500
M_Link0	39.8702	6889578.7	0.0010	0.9956	0.7508	0.7470	13.4846	0.0500
Runoff_N1	2.5982	448969.44	0.0001	0.9888	0.3733	0.2813	3.8240	0.0500
Runoff_M2	1.0566	182587.93	0.0002	0.7326	0.0151	0.8556	24.4978	0.0500
S_Link5	2.9794	514837.31	0.0001	0.9045	0.0863	0.5524	11.8001	0.0300
S_Link4	16.9529	2929462.0	0.0007	0.9964	0.1580	0.5277	38.4632	0.0500
S_Link3	17.8946	3092193.2	0.0005	0.9958	0.1593	0.6338	16.9213	0.0500
S_Link2	18.6726	3226627.9	0.0005	0.9952	0.5213	0.6273	10.1404	0.0500
S_Link1	19.1097	3302150.1	0.0007	0.9872	0.2826	0.8012	16.3495	0.0500
S_Link6	9.1556	1582085.6	0.0004	0.9973	0.1917	0.4044	12.8071	0.0500
Runoff_S1	0.7781	134456.65	0.0003	0.5991	0.0074	1.0010	29.1970	0.0500
Runoff_S2	1.4616	252564.21	0.0001	0.9971	0.0210	0.7597	17.2005	0.0500
Runoff_S3	0.5634	97348.926	0.0000	0.9973	0.1998	0.4404	7.6236	0.0500
S_Link10	7.7912	1346325.3	0.0003	0.9849	0.3835	0.3826	5.4946	0.0500
S_Link9	8.5813	1482852.8	0.0003	0.9963	0.3811	0.4263	6.2742	0.0500
S_Link8	8.5777	1482225.9	0.0004	0.9906	0.3965	0.4483	6.8739	0.0500
S_Link7	8.5746	1481694.3	0.0003	0.9715	0.4600	0.5583	9.5147	0.0500
Runoff_S4	0.7933	137079.25	0.0000	0.9861	0.1981	0.2338	2.3787	0.0500
S_Link12	0.7219	124745.34	0.0000	0.7285	0.1890	0.1665	1.4974	0.0300
S_Link11	7.7984	1347556.0	0.0003	0.9972	0.5415	0.3972	6.4504	0.0300
S_Link14	5.2056	899527.06	0.0002	0.9957	0.6161	0.3016	3.3646	0.0300
S_Link13	5.1974	898103.72	0.0002	0.9788	0.6577	0.2568	2.5192	0.0300
Runoff_S6	1.1647	201266.35	0.0001	0.7170	0.1034	0.2353	2.5818	0.0500
Runoff_S5	1.8694	323040.45	0.0001	0.9784	0.2925	0.2383	2.2717	0.0500
Runoff_S8	1.1538	199376.44	0.0000	0.9916	0.2138	0.2492	2.6150	0.0500
Runoff_S7	1.5678	270907.64	0.0001	0.9918	0.0444	0.4675	7.0029	0.0500
Runoff_S9	0.4192	72430.370	0.0000	0.8223	0.1132	0.1667	1.8026	0.0500
Runoff_US1	0.4645	80264.917	0.0000	0.9971	0.6800	0.0996	0.7096	0.0500
S_Link15	2.0503	354293.77	0.0001	0.7079	0.0341	0.5458	11.8614	0.0300
S_link16	0.0000	0.0000	0.0000	0.0000	0.0000	0.1943	2.2413	0.0300

Runoff_S10	2.0839	360100.55	0.0001	0.9971	0.6125	0.2014	1.9772	0.0500
Runoff_S11	1.0821	186994.79	0.0001	0.7430	2.3878	0.1564	1.3388	0.0500
N_Link6	2.4353	420825.97	0.0001	0.7285	0.3543	0.2253	2.0295	0.0300
N_Link5	2.4253	419098.41	0.0001	0.7172	0.3001	0.2564	2.7318	0.0300
N_Link3	15.0917	2607852.4	0.0004	0.9971	0.4591	0.6584	10.7117	0.0500
N_Link7	1.2145	209859.09	0.0001	0.7967	0.0346	0.4211	17.9439	0.0300
N_Link9	9.5194	1644959.6	0.0003	0.9956	0.1909	0.6354	49.6653	0.0500
N_Link8	1.2114	209331.39	0.0001	0.9964	0.5964	0.0688	2.7856	0.0300
Runoff_N2	1.9226	332229.89	0.0001	0.9954	0.3648	0.3755	5.8182	0.0500
Runoff_N3	1.2058	208364.02	0.0001	0.9639	0.5726	0.1437	1.3164	0.0500
Runoff_N8	2.0125	347759.95	0.0001	0.9971	0.3425	0.4297	5.7588	0.0500
Runoff_N5	1.1606	200555.47	0.0001	0.9881	0.3113	0.2170	1.9755	0.0500
NonameRd	7.1904	1242499.1	0.0001	0.9961	1.5747	0.1739	1.0022	0.0140
N_Link11.1	7.1640	1237942.9	0.0001	0.9869	1.2545	0.2466	1.2677	0.0140
N_Link11	8.2533	1426178.2	0.0002	0.9746	0.9541	0.2838	3.5906	0.0500
LacyRd_N3b	8.3759	1447351.5	0.0001	0.9963	1.0605	0.3033	1.8823	0.0140
LacyRd_N3a	8.3749	1447181.4	0.0001	0.9962	1.1090	0.3031	1.2962	0.0140
N_Link10	8.3686	1446101.1	0.0002	0.9457	0.3200	0.2450	12.5566	0.0500
Runoff_N6	0.5426	93762.370	0.0000	0.9685	0.3123	0.1338	0.9002	0.0500
Roff_US_N1	0.7769	134246.08	0.0001	0.9973	0.5711	0.1452	1.0880	0.0500
N_Link14	0.5944	102707.63	0.0000	0.9141	0.1681	0.2260	2.1040	0.0300
Roff_US_N2	1.3191	227944.15	0.0001	0.9973	0.5543	0.1826	1.5454	0.0500
N_Link16	1.3248	228927.54	0.0001	0.9970	0.3224	0.2437	2.2769	0.0300
Runoff_N7	0.1234	21328.238	0.0000	0.9683	0.1470	0.1173	0.7726	0.0500
N_Link12	3.2211	556602.28	0.0001	0.9916	0.6028	0.2701	1.7755	0.0500
N_Link12.1	4.4697	772370.22	0.0002	0.9973	0.4565	0.1523	6.8236	0.0500
Runoff_N2.	0.4150	71715.127	0.0001	0.9973	0.1588	0.3444	4.4881	0.0500
Runoff_N1.	0.2657	45911.598	0.0000	0.9831	0.2254	0.2632	3.3522	0.0500
N_Link4	14.7798	2553943.2	0.0010	0.8901	0.3010	0.6120	9.4765	0.0500
RR_br	14.7812	2554183.4	0.0100	0.8904	0.3790	0.5226	11.6531	0.0300
Link120	2.5649	443206.55	0.0003	0.9974	0.6061	0.2703	2.7889	0.0500
N_Combine	2.1873	377959.67	0.0000	0.7157	0.4720	0.2111	1.8941	0.0500
Link124	3.8914	672428.11	0.0004	0.9973	1.1071	0.3092	3.4111	0.0500
Link128	1.8164	313876.63	0.0002	0.9973	0.5683	0.2304	2.1460	0.0500
N_Combine.	1.0902	188388.10	0.0000	0.7316	0.1770	0.2145	1.9266	0.0500
Link156	2.4453	422549.47	0.0002	0.9974	1.0400	0.2646	2.6075	0.0500
Link160	0.5759	99514.005	0.0001	0.9974	0.2992	0.1723	1.3566	0.0500
Link152	3.5103	606582.26	0.0003	0.9974	0.4867	0.3106	3.2807	0.0500
SE2_Link	2.5087	433496.56	0.0001	0.7522	0.4210	0.2307	2.1144	0.0500
Link148	1.1952	206523.68	0.0001	0.9972	0.2332	0.2462	2.1627	0.0500
Link144	2.0808	359559.12	0.0002	0.9974	0.4250	0.2379	2.2902	0.0500
Link140	1.0231	176787.14	0.0001	0.9974	0.5650	0.1964	1.6882	0.0500
Link132	2.7186	469779.25	0.0003	0.9974	0.5386	0.2665	2.7149	0.0500
Link136	2.0572	355479.21	0.0002	0.9973	0.7441	0.2296	2.2856	0.0500
Link166	1.3064	225743.32	0.0000	0.7195	0.1901	0.2583	2.4042	0.0500
Link167	1.5883	274453.78	0.0000	0.7421	0.2364	0.2263	2.1242	0.0500
Link169	0.8471	146374.95	0.0000	0.7135	0.2158	0.1664	1.2718	0.0500
Link170	0.4379	75674.783	0.0000	0.7217	0.0830	0.2854	4.0836	0.0500
Link171	1.0794	186517.53	0.0002	0.7258	0.0134	0.9745	27.9509	0.0500
Link172	1.1091	191646.97	0.0001	0.8830	0.0192	0.7633	17.1610	0.0500
Link174	0.2991	51676.177	0.0000	0.7261	0.0948	0.1585	1.7380	0.0500
Link175	1.3162	227435.18	0.0001	0.7224	0.0540	0.4783	6.9971	0.0500
USH14_NCul	16.9934	2936457.9	0.0002	0.9840	0.1417	0.9118	16.0539	0.0140
LacyN1_Cul	19.5742	3382418.2	0.0002	0.9953	0.4878	0.5699	8.9050	0.0140
280.1	34.3374	5933495.2	0.0009	0.9532	0.3867	0.9646	12.3849	0.0500
Lacy_MCulv	39.6354	6848996.6	0.0009	0.8968	0.2432	1.2682	30.9331	0.0240
284.1	39.8736	6890151.1	0.0010	0.9965	0.4837	0.7294	17.8420	0.0240
USH14_SCul	19.1096	3302139.8	0.0003	0.9945	0.4620	0.4825	5.1542	0.0140
EHill_Culv	7.7918	1346418.4	0.0003	0.9947	1.4058	0.3805	2.2354	0.0240
SyeneS1Cul	8.5783	1482328.2	0.0004	0.9913	0.8549	0.4058	2.7257	0.0240
Irish1Culv	8.5769	1482091.1	0.0002	0.9759	0.5134	0.3463	2.4971	0.0240
Irish2Culv	0.7190	124238.71	0.0000	0.8481	1.2178	0.1301	0.3651	0.0240
Irish3Culv	-2.8808	-497797.5	0.0001	0.9957	0.0082	0.6055	6.7984	0.0240
RR_S3Culv	1.0814	186871.86	0.0000	0.9947	2.3888	0.2723	1.4841	0.0240
Irish0Culv	2.0811	359618.18	0.0000	0.9971	0.0855	0.4847	3.7822	0.0240
SyeneN1_Cu	1.5881	274428.91	0.0001	0.7316	0.6593	0.2212	0.8300	0.0240
LacyN2_Cul	2.4352	420810.00	0.0001	0.7233	0.7961	0.2341	0.8543	0.0240
SyeneN2_Cu	12.3541	2134786.8	0.0003	0.9895	0.1409	1.0178	8.1557	0.0240
SyeneN1_C	1.2110	209267.51	0.0000	0.8728	1.0406	0.0798	0.6840	0.0140
JonesFrm_C	9.5261	1646106.6	0.0002	0.9964	1.4377	0.2135	1.9706	0.0140
592.1	1.2209	210970.19	0.0001	0.9970	3.3902	0.1266	0.2145	0.0140
SwnCrNout	3.1251	540016.82	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	3.5521	613806.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW1_vweir	1.3067	225805.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	2.1878	378059.42	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	1.0901	188375.49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	1.3167	227520.59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	0.2989	51650.585	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	2.5083	433439.95	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	1.1091	191653.07	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

E1_vweir	1.0800	186619.07	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	0.4379	75666.802	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	1.5884	274470.46	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE2_vweir	0.8473	146420.42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	0.0691	11933.234	0.0000	0.9958	5.2829	0.0243	0.0076	0.0009
3.25in	0.2235	38614.263	0.0000	0.7268	1.5277	0.0500	0.0413	0.0018
USH14_NOvr	0.0000	0.0000						
LacyN1_Ovr	0.0000	0.0000						
PrivateDr	5.3488	924273.35						
Lacy_MOvr	0.0000	0.0000						
MM_ovr	0.0000	0.0000						
USH14_SOvr	0.0000	0.0000						
EHill_Ovr.1	0.0000	0.0000						
SyeneS1_Ovr	0.0000	0.0000						
irish1_Ovr.1	0.0000	0.0000						
Irish2Ovr	0.0000	0.0000						
Irish3Ovr	0.0000	0.0000						
RR_S3_Ovr	0.0000	0.0000						
irish0_Ovr.1	0.0000	0.0000						
SyeneN1_Ov	0.0000	0.0000						
LacyN2_Ovr	0.0000	0.0000						
SyeneN2_Ov	0.0000	0.0000						
SyeneN1_Ov.1	0.0000	0.0000						
JonesFrm_O	0.0000	0.0000						
Lacy_N3_Ov.1	0.0000	0.0000						
StandPipe	0.3048	52674.455						
QuarryOvr	0.0000	0.0000						
NobelWeir	0.0991	17125.746						
SwnCrWeirN	0.0000	0.0000						
SwanCkSout.1	5.6816	981774.92						
Weir10	12.3578	2135431.6						
weir11	0.0009	152.6216						
weir14	0.0000	0.0000						
weirtop	0.0000	0.0000						
RR_S4out	0.0000	0.0000						
NW1_Iweir	1.4226	245823.57						
NW1_ovweir	0.0000	0.0000						
N1_Iweir	2.4254	419110.39						
N1_ovrweir	0.0000	0.0000						
N2_Iweir	1.1522	199098.15						
N2_ovrweir	0.0000	0.0000						
SW2_ovweir	0.0000	0.0000						
SW2_Iweir	1.4937	258105.24						
SW1_Iweir	0.3084	53291.081						
SW1_ovweir	0.0000	0.0000						
SE2_Iweir	2.7543	475935.38						
SE2_ovweir	0.0000	0.0000						
SE1_Iweir	1.1471	198221.79						
SE1_ovweir	0.0000	0.0000						
E1_Iweir	1.2183	210525.59						
E1_ovrweir	0.0000	0.0000						
NE1_Iweir	0.5056	87369.436						
NE1_ovweir	0.0000	0.0000						
NE3_Iweir	1.7767	307013.20						
NE2_Iweir	0.9947	171883.54						
NE3_ovweir	0.0000	0.0000						
NE2_ovweir	0.0000	0.0000						
NW1_inf	1.1447	197800.86						
N1_inf	1.4680	253677.22						
N2_inf	0.6648	114871.21						
SW2_inf	0.9543	164894.88						
SW1_inf	0.2676	46242.616						
SE2_inf	0.7571	130823.41						
SE1_inf	0.0480	8288.2553						
E1_inf	0.8645	149387.40						
NE1_inf	0.5176	89438.511						
NE3_inf	0.9427	162896.84						
NE2_inf	1.0619	183488.99						
FREE # 1	39.8707	6889664.0						

Table E18 - Junction Continuity Error. Division by Volume added 11/96
Continuity Error = Net Flow + Beginning Volume - Ending Volume
Total Flow + (Beginning Volume + Ending Volume)/2
Net Flow = Node Inflow - Node Outflow
Total Flow = absolute (Inflow + Outflow)
Intermediate column is a judgement on the node continuity error.

```
|                                                                              |
|  Excellent  < 1 percent    Great  1 to  2 percent  Good  2 to  5 percent     |
|  Fair  5 to 10  percent    Poor  10 to 25 percent  Bad  25 to 50 percent     |
|  Terrible > 50  percent                                                      |
*==============================================================================*
```

Junction Name	<------Continuity Error -------> Volume	% of Node	% of Inflow	Remaining Volume	Beginning Volume	Net Flow Thru Node	Total Flow Thru Node	Failed to Converge
N1	1105.4793	0.0188	0.0123	1578.9072	0.0000	2684.3865	5870218.134	0
USH14_NDet	-3889.3918	-0.0661	0.0434	7497.6279	0.0000	3608.2361	5876540.206	0
LacyRd_Det	-373.9169	-0.0055	0.0042	675.9257	0.0000	302.0088	6765147.850	0
N0	-52.8439	-0.0008	0.0006	1018.8000	0.0000	965.9561	6763861.973	0
M7	1488.0914	0.0111	0.0166	3084.5726	0.0000	4572.6640	13362586.20	0
S0	-627.4733	-0.0095	0.0070	637.2396	0.0000	9.7663	6604289.819	0
S1	-391.4728	-0.0059	0.0044	544.8053	0.0000	153.3325	6604442.403	0
S2	-1058.2580	-0.0164	0.0118	1082.8976	0.0000	24.6395	6453277.726	0
M6	1842.7043	0.0134	0.0205	1938.0872	0.0000	3780.7915	13719348.82	0
M5	1366.0227	0.0100	0.0152	3404.6766	0.0000	4770.6993	13710754.75	0
M4	397.3875	0.0029	0.0044	3542.3793	0.0000	3939.7668	13701982.77	0
M3	2226.2261	0.0163	0.0248	1806.7437	0.0000	4032.9698	13693904.15	0
M1	-1116.6213	-0.0081	0.0124	1750.1321	0.0000	633.5109	13780970.28	0
M0	272.1736	0.0020	0.0030	272.6738	0.0000	544.8474	13779729.74	0
M_out	-206.5707	-0.0015	0.0023	122.9830	0.0000	-83.5877	13779242.65	0
D-S_N1	-225.2794	-0.0251	0.0025	4.5689	0.0000	-220.7104	897719.9354	0
D-S_M2	-123.3972	-0.0338	0.0014	35.6451	0.0000	-87.7521	365092.4335	0
S3	22575.5042	0.3636	0.2517	1183.6994	0.0000	23759.2036	6208172.739	0
S4	-37292.8013	-0.6401	0.4157	3172.9418	0.0000	-34119.8595	5824889.844	0
S6	-3696.8167	-0.1169	0.0412	633.2489	0.0000	-3063.5678	3161128.817	0
S5	-1872.0603	-0.1819	0.0209	791.4303	0.0000	-1080.6300	1028598.788	0
McGaw_NE1	-148.9379	-0.0421	0.0017	0.0024	0.0000	-148.9355	353431.9764	0
D-S_S1	-137.1348	-0.0510	0.0015	72.6611	0.0000	-64.4737	268845.5761	0
D-S_S2	-4.4184	-0.0009	0.0000	44.0414	0.0000	39.6229	505158.4914	0
D-S_S3	-48.5710	-0.0250	0.0005	0.0047	0.0000	-48.5663	194648.8446	0
S7	209.3122	0.0071	0.0023	171.4763	0.0000	380.7885	2963785.438	0
S8	-2.5705	-0.0001	0.0000	130.3795	0.0000	127.8089	2964316.999	0
S9	-22.1630	-0.0007	0.0002	121.3894	0.0000	99.2264	2964554.034	0
S10	250.4666	0.0084	0.0028	263.6292	0.0000	514.0957	2965180.941	0
S11	49.8629	0.0017	0.0006	486.5833	0.0000	536.4461	2966257.363	0
S12	-146.2902	-0.0054	0.0016	228.9856	0.0000	82.6954	2692743.728	0
EHill_DetS	632.7983	0.0235	0.0071	493.3582	0.0000	1126.1565	2693974.384	0
D-S_S4	-82.1749	-0.0300	0.0009	3.2975	0.0000	-78.8774	274082.3692	0
S13	-1954.3024	-0.0726	0.0218	272.1425	0.0000	-1682.1599	2693445.509	0
S14	-574.6815	-0.2308	0.0064	66.3248	0.0000	-508.3567	248984.0554	0
S16	1085.5889	0.0604	0.0121	331.4153	0.0000	1417.0042	1797630.774	0
S17	-1384.7884	-0.0770	0.0154	295.6757	0.0000	-1089.1127	1797967.351	0
S18	232.5458	0.0233	0.0026	308.3628	0.0000	540.9086	996140.3246	0
S15	-142.6671	-0.0574	0.0016	7.6549	0.0000	-135.0122	248345.2602	0
D-S_S6	-124.8980	-0.0310	0.0014	5.3367	0.0000	-119.5613	402411.9791	0
D-S_S5	-119.0605	-0.0184	0.0013	3.1213	0.0000	-115.9392	645964.5915	0
D-S_S8	-21.6282	-0.0054	0.0002	5.3367	0.0000	-16.2914	398738.7898	0
D-S_S7	-128.0292	-0.0236	0.0014	91.8882	0.0000	-36.1410	541780.0613	0
D-S_S9	-52.0166	-0.0359	0.0006	2.2528	0.0000	-49.7638	144811.3108	0
U-S_S1	110.2512	0.0686	0.0012	0.0089	0.0000	110.2602	160640.3627	0
RR_Det3	-6.0662	-0.0016	0.0001	128.6789	0.0000	122.6127	373866.6547	0
RR_Det4	28315.7514	10.6390	0.3157	158555.3527	0.0000	186871.1041	186871.8638	0
S19	3792.6574	0.5307	0.0423	1525.6948	0.0000	5318.3522	713911.9480	0
Irish_Det0	-194.0124	-0.0269	0.0022	673.9669	0.0000	479.9545	719718.7271	0
D-S_S10	-17.8564	-0.0025	0.0002	0.0098	0.0000	-17.8466	720184.0955	0
D-S_S11	-20.7990	-0.0056	0.0002	0.1204	0.0000	-20.6786	373969.1210	0
N2	12971.2005	0.2477	0.1446	4826.8648	0.0000	17798.0653	5233510.742	0
N3	-1248.3502	-0.0244	0.0139	921.8090	0.0000	-326.5412	5108068.637	0
N5	1562.8412	0.1861	0.0174	142.8610	0.0000	1705.7023	839908.4114	0
N6	0.7476	0.0001	0.0000	14.1890	0.0000	14.9366	841635.9745	0
N7	-49.3601	-0.0059	0.0006	25.3631	0.0000	-23.9971	841629.8331	0
N8	-3.4254	-0.0006	0.0000	25.4399	0.0000	22.0145	548882.6926	0
N4	31.3849	0.0007	0.0003	755.6347	0.0000	787.0196	4270370.999	0
SwanCk_N	3330.4832	0.3015	0.0371	14267.4246	0.0000	17597.9079	1097635.855	0
SwanCk_S	19402.6461	0.5960	0.2163	29985.1681	0.0000	49387.8142	3240540.601	0
N10	22.6237	0.0054	0.0003	41.8409	0.0000	64.4646	418598.8994	0
N9	-1161.0531	-0.2768	0.0129	567.8750	0.0000	-593.1780	419126.5978	0
N12	-323.5963	-0.0098	0.0036	870.2014	0.0000	546.6051	3292763.253	0
N11	-7647.4325	-0.2321	0.0853	8781.3007	0.0000	1133.8683	3291066.241	0
N10.1	-1009.1422	-0.2416	0.0112	41.1793	0.0000	-967.9628	417695.4073	0
D-S_N2	745.8068	0.1121	0.0083	4.4647	0.0000	750.2715	665214.3233	0
D-S_N3	-27.1929	-0.0065	0.0003	0.0313	0.0000	-27.1616	416700.8664	0
D-S_N8	-206.2495	-0.0297	0.0023	11.1693	0.0000	-195.0802	695326.0567	0
D-S_N5	-100.1335	-0.0250	0.0011	2.7531	0.0000	-97.3804	401018.5175	0
N13	181.8575	0.0063	0.0020	887.3899	0.0000	1069.2474	2893282.565	0
N14	101.0973	0.0035	0.0011	65.6686	0.0000	166.7659	2894532.928	0

N15	-3.2716	-0.0001	0.0000	147.5289	0.0000	144.2573	2894857.961	0
CrossDetE	722.2958	0.0291	0.0081	3824.8212	0.0000	4547.1170	2480441.946	0
CrossDetW	649.4108	0.0261	0.0072	921.8468	0.0000	1571.2576	2486591.352	0
N16	-1.5674	-0.0001	0.0000	148.9379	0.0000	147.3705	2852509.174	0
QuarryHDet	4237.6740	1.6892	0.0472	26787.4343	0.0000	31025.1083	237468.0348	0
D-S_N6	-24.4834	-0.0131	0.0003	1.7861	0.0000	-22.6973	187502.1503	0
U-S_N1	-20.0149	-0.0075	0.0002	0.0089	0.0000	-20.0060	268472.6873	0
N19	218.3480	0.1060	0.0024	295.4315	0.0000	513.7795	205929.5836	0
N17	197.1888	0.0177	0.0022	580.3402	0.0000	777.5291	1113980.778	0
U-S_N2	-41.2791	-0.0091	0.0005	0.0089	0.0000	-41.2703	455848.1613	0
NobelDrDet	-171.9832	-0.0377	0.0019	19.7803	0.0000	-152.2029	456040.0866	0
N20	-1023.0722	-0.2238	0.0114	191.2160	0.0000	-831.8561	457023.4725	0
D-S_N7	-16.7694	-0.0393	0.0002	3.2468	0.0000	-13.5226	42643.0239	0
D-S_N6.1	-731.1087	-0.0473	0.0082	182.6986	0.0000	-548.4101	1544194.532	0
D-S_N2.1	-266.1630	-0.1858	0.0030	42.1653	0.0000	-223.9977	143209.9510	0
D-S_N1.1	-61.4851	-0.0670	0.0007	7.4018	0.0000	-54.0833	91770.2907	0
N3.1	-689.4319	-0.0135	0.0077	869.2901	0.0000	179.8582	5108126.607	0
SwanCk_C	-54.9290	-0.0013	0.0006	281.0934	207.8849	18.2795	4271181.999	0
Node36	-342.0370	0.0000	0.0038	342.0370	0.0000	0.0000	0.0000	0
McGaw_NW1	-272.6648	-0.0308	0.0030	0.0014	0.0000	-272.6634	886143.9089	0
NW1_infil	-416.4957	-0.0470	0.0046	0.0012	0.0000	-416.4944	886830.9753	0
NW1_pump	197800.9104	100.0000	2.2051	0.0000	0.0000	197800.9104	197800.8577	0
NW1_det	3252.0205	0.6775	0.0363	16767.2808	0.0000	20019.3013	471628.6257	0
Node42	36.4511	0.0081	0.0004	24.7469	0.0000	61.1980	451548.3798	0
McGaw_N1	-245.0906	-0.0182	0.0027	0.0014	0.0000	-245.0892	1344614.407	0
McGaw_N2	-108.4277	-0.0173	0.0012	0.0022	0.0000	-108.4255	627647.4296	0
Node49	81.1288	0.0107	0.0009	18.8625	0.0000	99.9913	756019.0867	0
N1_infil	-356.7157	-0.0265	0.0040	0.0012	0.0000	-356.7144	1345215.713	0
N1_det	7053.3068	0.8663	0.0786	33999.6967	0.0000	41053.0035	797169.8057	0
N1_pump	253677.3147	100.0000	2.8280	0.0000	0.0000	253677.3147	253677.2150	0
N2_infil	-88.5160	-0.0141	0.0010	0.0019	0.0000	-88.5141	627845.9804	0
N2_det	1779.3249	0.4540	0.0198	8945.0542	0.0000	10724.3791	387473.6336	0
N2_pump	114871.3054	100.0001	1.2806	0.0000	0.0000	114871.3054	114871.2065	0
Node49.1	-27.3932	-0.0073	0.0003	12.8247	0.0000	-14.5685	376763.5845	0
SW2_det	5272.8067	1.0582	0.0588	25313.9543	0.0000	30586.7611	485625.8323	0
SW2_infil	-445.0012	-0.0526	0.0050	0.0012	0.0000	-445.0000	845549.5947	0
SW2_pump	164895.0224	100.0001	1.8382	0.0000	0.0000	164895.0224	164894.8765	0
McGaw_SW2	-199.4759	-0.0236	0.0022	0.0014	0.0000	-199.4746	844902.6174	0
Node37.1	-37.7512	-0.0083	0.0004	120.6740	0.0000	82.9228	454955.7656	0
McGaw_SW1	-82.7695	-0.0416	0.0009	0.0022	0.0000	-82.7672	198949.3431	0
SW1_infil	-17.9091	-0.0090	0.0002	0.0020	0.0000	-17.9071	199047.7028	0
SW1_det	234.4444	0.2219	0.0026	1406.9773	0.0000	1641.4217	104941.6659	0
SW1_pump	46242.6379	100.0000	0.5155	0.0000	0.0000	46242.6379	46242.6162	0
McGaw_SE2	-184.9047	-0.0152	0.0021	0.0014	0.0000	-184.9034	1212984.792	0
SE2_infil	-178.0752	-0.0147	0.0020	0.0012	0.0000	-178.0740	1213341.048	0
SE2_pump	130823.6606	100.0002	1.4584	0.0000	0.0000	130823.6606	130823.4110	0
SE2_det	7574.7163	0.8173	0.0844	34919.6953	0.0000	42494.4117	909375.3319	0
Node89	-77.4922	-0.0089	0.0009	19.5929	0.0000	-57.8993	866936.5078	0
McGaw_SE1	-24.0742	-0.0058	0.0003	0.0014	0.0000	-24.0728	413023.2001	0
SE1_infil	12.9810	0.0031	0.0001	0.0013	0.0000	12.9823	413033.7334	0
SE1_det	1446.6764	0.3686	0.0161	5120.5899	0.0000	6567.2663	389874.8638	0
SE1_pump	8288.2852	100.0004	0.0924	0.0000	0.0000	8288.2852	8288.2553	0
Node90	-47.0489	-0.0123	0.0005	56.6934	0.0000	9.6445	383300.0402	0
McGaw_E1	-151.7806	-0.0211	0.0017	0.0022	0.0000	-151.7784	718969.7856	0
E1_infil	-347.7351	-0.0483	0.0039	0.0020	0.0000	-347.7331	719472.1151	0
E1_pump	149387.4946	100.0001	1.6654	0.0000	0.0000	149387.4946	149387.4039	0
E1_det	4098.0285	1.0068	0.0457	19811.0826	0.0000	23909.1111	397144.6548	0
Node51.1	6.7237	0.0018	0.0001	84.3225	0.0000	91.0462	373136.5980	0
NE1_infil	-18.8062	-0.0053	0.0002	0.0021	0.0000	-18.8040	353595.0862	0
NE1_pump	89438.5289	100.0000	0.9971	0.0000	0.0000	89438.5289	89438.5110	0
NE1_det	1906.2310	1.1351	0.0213	9797.6888	0.0000	11703.9199	163036.2378	0
Node51.2	-20.6675	-0.0137	0.0002	12.3025	0.0000	-8.3651	151341.5854	0
McGaw_NE3	-155.0322	-0.0165	0.0017	0.0022	0.0000	-155.0301	939408.0078	0
McGaw_NE2	-229.4271	-0.0323	0.0026	0.0026	0.0000	-229.4245	710730.8487	0
Node50	-7.0611	-0.0013	0.0001	22.0198	0.0000	14.9587	548924.2379	0
NE3_infil	-128.0770	-0.0136	0.0014	0.0019	0.0000	-128.0751	939689.2975	0
NE3_det	5219.5326	0.8770	0.0582	27324.7939	0.0000	32544.3265	581483.6570	0
NE3_pump	162896.8276	100.0000	1.8160	0.0000	0.0000	162896.8276	162896.8442	0
NE2_det	4005.7627	1.2174	0.0447	21459.0578	0.0000	25464.8205	318303.9513	0
NE2_pump	183488.9718	100.0000	2.0455	0.0000	0.0000	183488.9718	183488.9911	0
NE2_infil	108.6175	0.0153	0.0012	0.0023	0.0000	108.6198	710851.7339	0
Node87	28.5227	0.0097	0.0003	16.0887	0.0000	44.6114	292795.3656	0
Node91	-32.5439	-0.0315	0.0004	4.7897	0.0000	-27.7542	103326.7617	0

The total continuity error was 1.57887E+06 cubic feet
The remaining total volume was 5.01214E+05 cubic feet
Your mean node continuity error was Excellent
Your worst node continuity error was Good

Selected XP-SWMM Output, Post-development Conditions, 100-year event
Expanded model for resource impact analysis

```
#####################################
# Rainfall input summary from Runoff #
#####################################

 Total rainfall for gage #     1 is    6.0000 inches

        ################################################
        # Table R9. Summary Statistics for Subcatchments #
        ################################################

 Note: Total Runoff Depth includes pervious & impervious area
       Pervious and Impervious Runoff Depth is only the runoff from those two areas.
```

Subcatchment.....	D-S_N2.1#1	D-S_N2.1#2	McGaw_NE2#1	McGaw_NE2#2	McGaw_NE3#1	McGaw_NE3#2
Area (acres).....	6.64500	4.42800	35.11000	11.15000	42.33000	37.32000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.27231	0.00000	2.01608	0.00000	2.07233
Total Losses (in).....	0.00000	3.72769	0.00000	3.98392	0.00000	3.92767
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	9.78879	0.00000	18.76731	0.00000	71.32692
Total Impervious Area						
Total Runoff Depth (in)	5.78455	0.00000	5.79223	0.00000	5.95384	0.00000
Peak Runoff Rate (cfs).	30.41760	0.00000	151.82729	0.00000	197.19646	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78455	2.27231	5.79223	2.01608	5.95384	2.07233
Peak Runoff Rate (cfs).	30.41760	9.78879	151.82729	18.76731	197.19646	71.32692
Unit Runoff (in/hr)....	4.57752	2.21066	4.32433	1.68317	4.65855	1.91123
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N3#1	D-S_N3#2	D-S_N8#1	D-S_N8#2	D-S_N5#1	D-S_N5#2
Area (acres).....	0.87800	93.32300	26.85300	84.94700	17.00800	33.56600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.65704	0.00000	1.87280	0.00000	1.89080
Total Losses (in).....	0.00000	3.34296	0.00000	4.12720	0.00000	4.10920
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	193.12783	0.00000	56.22107	0.00000	27.83671
Total Impervious Area						
Total Runoff Depth (in)	5.78098	0.00000	5.79086	0.00000	5.79500	0.00000
Peak Runoff Rate (cfs).	3.53674	0.00000	56.26915	0.00000	43.99985	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78098	2.65704	5.79086	1.87280	5.79500	1.89080
Peak Runoff Rate (cfs).	3.53674	193.12783	56.26915	56.22107	43.99985	27.83671
Unit Runoff (in/hr)....	4.02818	2.06946	2.09545	0.66184	2.58701	0.82931
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N6#1	D-S_N6#2	U-S_N1#1	U-S_N1#2	U-S_N2#1	U-S_N2#2
Area (acres).....	5.48900	22.96600	11.07700	23.50500	21.83900	13.75600
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.41235	0.00000	1.96208	0.00000	1.99814
Total Losses (in).....	0.00000	3.58765	0.00000	4.03792	0.00000	4.00186
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	40.61425	0.00000	41.66566	0.00000	25.56373
Total Impervious Area						
Total Runoff Depth (in)	5.78057	0.00000	5.78266	0.00000	5.76495	0.00000
Peak Runoff Rate (cfs).	21.23424	0.00000	49.62053	0.00000	98.74071	0.00000
Impervious Area with depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						
Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						
Total Runoff Depth (in)	5.78057	2.41235	5.78266	1.96208	5.76495	1.99814
Peak Runoff Rate (cfs).	21.23424	40.61425	49.62053	41.66566	98.74071	25.56373
Unit Runoff (in/hr)....	3.86851	1.76845	4.47960	1.77263	4.52130	1.85837
Rational Formula						
Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_NW1#1	McGaw_NW1#2	D-S_N6.1#1	D-S_N6.1#2	McGaw_N1#1	McGaw_N1#2
Area (acres).....	44.95000	6.10000	16.53900	46.47000	65.18000	32.31000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						
Total Runoff Depth (in)	0.00000	2.00659	0.00000	1.99524	0.00000	2.01244
Total Losses (in).....	0.00000	3.99341	0.00000	4.00476	0.00000	3.98756
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	11.38651	0.00000	69.77865	0.00000	55.54922
Total Impervious Area						
Total Runoff Depth (in)	5.76495	0.00000	5.78098	0.00000	5.78177	0.00000
Peak Runoff Rate (cfs).	203.23251	0.00000	66.62209	0.00000	283.49708	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.76495	2.00659	5.78098	1.99524	5.78177	2.01244
Peak Runoff Rate (cfs).	203.23251	11.38651	66.62209	69.77865	283.49708	55.54922
Unit Runoff (in/hr)....	4.52130	1.86664	4.02818	1.50158	4.34945	1.71926
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_N2#1	McGaw_N2#2	D-S_N7#1	D-S_N7#2	D-S_N2#1	D-S_N2#2
Area (acres).....	27.94000	33.51000	0.54400	14.63800	0.05500	200.61100
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	0.00000	2.02630	0.00000	1.93449	0.00000	2.34714
Total Losses (in).....	0.00000	3.97370	0.00000	4.06551	0.00000	3.65286
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	60.98583	0.00000	22.70834	0.00000	338.89965
Total Impervious Area						

Total Runoff Depth (in)	5.82159	0.00000	5.77551	0.00000	5.79514	0.00000
Peak Runoff Rate (cfs).	125.49012	0.00000	2.29211	0.00000	0.21154	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.82159	2.02630	5.77551	1.93449	5.79514	2.34714
Peak Runoff Rate (cfs).	125.49012	60.98583	2.29211	22.70834	0.21154	338.89965
Unit Runoff (in/hr)....	4.49141	1.81993	4.21345	1.55133	3.84618	1.68934
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_N1#1	D-S_N1#2	U-S_S1#1	U-S_S1#2	McGaw_SE2#1	McGaw_SE2#2
Area (acres).....	1.09300	184.35100	0.07600	35.85200	51.90000	87.78000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	0.00000	2.80343	0.00000	2.70946	0.00000	2.00267
Total Losses (in).....	0.00000	3.19657	0.00000	3.29054	0.00000	3.99733
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	269.73310	0.00000	85.71524	0.00000	165.12017
Total Impervious Area						

Total Runoff Depth (in)	5.79668	0.00000	5.79464	0.00000	5.75370	0.00000

Peak Runoff Rate (cfs).	3.08678	0.00000	0.33490	0.00000	234.73263	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.79668	2.80343	5.79464	2.70946	5.75370	2.00267
Peak Runoff Rate (cfs).	3.08678	269.73310	0.33490	85.71524	234.73263	165.12017
Unit Runoff (in/hr)....	2.82413	1.46315	4.40661	2.39081	4.52279	1.88107
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S3#1	D-S_S3#2	D-S_S9#1	D-S_S9#2	McGaw_SW1#1	McGaw_SW1#2
Area (acres).....	4.73300	44.03800	0.00400	28.23400	9.22000	7.90000
Percent Impervious.....	100.00000	0.00000	100.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	0.00000	1.99004	0.00000	2.90837	0.00000	2.02003
Total Losses (in).....	0.00000	4.00996	0.00000	3.09163	0.00000	3.97997
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	64.49235	0.00000	64.29462	0.00000	15.95027
Total Impervious Area						

Total Runoff Depth (in)	5.79044	0.00000	5.78098	0.00000	5.80357	0.00000
Peak Runoff Rate (cfs).	18.86623	0.00000	0.01611	0.00000	42.53244	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	5.79044	1.99004	5.78098	2.90837	5.80357	2.02003
Peak Runoff Rate (cfs).	18.86623	64.49235	0.01611	64.29462	42.53244	15.95027
Unit Runoff (in/hr)....	3.98610	1.46447	4.02818	2.27721	4.61306	2.01902
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S6#2	D-S_S8#1	D-S_S8#2	D-S_S7#1	D-S_S7#2	McGaw_SW2#1
Area (acres).....	84.15200	5.11800	86.82700	0.04900	110.86000	41.12000
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.81048	0.00000	2.39027	0.00000	2.84005	0.00000
Total Losses (in).....	3.18952	0.00000	3.60973	0.00000	3.15995	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	158.38667	0.00000	98.24648	0.00000	179.33265	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.79187	0.00000	5.79495	0.00000	5.79212
Peak Runoff Rate (cfs).	0.00000	13.48996	0.00000	0.15044	0.00000	189.15877
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.81048	5.79187	2.39027	5.79495	2.84005	5.79212
Peak Runoff Rate (cfs).	158.38667	13.48996	98.24648	0.15044	179.33265	189.15877
Unit Runoff (in/hr)....	1.88215	2.63579	1.13152	3.07028	1.61765	4.60016
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_SW2#2	D-S_S5#1	D-S_S5#2	D-S_S4#1	D-S_S4#2	D-S_S2#1
Area (acres).....	18.32000	7.77400	118.67600	7.78200	52.11100	0.12400
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.01604	0.00000	2.62273	0.00000	1.99936	0.00000
Total Losses (in).....	3.98396	0.00000	3.37727	0.00000	4.00064	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	36.71133	0.00000	193.01594	0.00000	49.61726	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.78616	0.00000	5.79291	0.00000	5.79514
Peak Runoff Rate (cfs).	0.00000	26.02090	0.00000	21.47373	0.00000	0.47693
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.01604	5.78616	2.62273	5.79291	1.99936	5.79514
Peak Runoff Rate (cfs).	36.71133	26.02090	193.01594	21.47373	49.61726	0.47693
Unit Runoff (in/hr)....	2.00389	3.34717	1.62641	2.75941	0.95215	3.84618
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_S2#2	D-S_S11#1	D-S_S11#2	D-S_S10#1	D-S_S10#2	McGaw_SE1#1
Area (acres).....	103.73900	11.71100	51.90000	1.74400	153.66700	11.93000
Percent Impervious.....	0.00000	100.00000	0.00000	100.00000	0.00000	100.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.83077	0.00000	2.17044	0.00000	2.71445	0.00000
Total Losses (in).....	3.16923	0.00000	3.82956	0.00000	3.28555	0.00000
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Peak Runoff Rate (cfs).	216.19093	0.00000	72.71709	0.00000	248.59235	0.00000
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.79194	0.00000	5.78554	0.00000	5.78870
Peak Runoff Rate (cfs).	0.00000	41.72558	0.00000	5.59892	0.00000	45.39038
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.83077	5.79194	2.17044	5.78554	2.71445	5.78870
Peak Runoff Rate (cfs).	216.19093	41.72558	72.71709	5.59892	248.59235	45.39038
Unit Runoff (in/hr)....	2.08399	3.56294	1.40110	3.21039	1.61773	3.80473
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	McGaw_SE1#2	McGaw_E1#1	McGaw_E1#2	D-S_S1#2	McGaw_NE1#1	McGaw_NE1#2
Area (acres).....	46.24000	32.82000	34.68000	57.90000	17.10000	9.24000
Percent Impervious.....	0.00000	100.00000	0.00000	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000	4.56000	4.56000	4.56000
Pervious Area						

Total Runoff Depth (in)	2.54184	0.00000	2.00659	2.76530	0.00000	2.00544
Total Losses (in).....	3.45816	0.00000	3.99341	3.23470	0.00000	3.99456
Remaining Depth (in)...	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	84.37480	0.00000	64.73512	133.26034	0.00000	18.20412
Total Impervious Area						

Total Runoff Depth (in)	0.00000	5.76495	0.00000	0.00000	5.76166	0.00000
Peak Runoff Rate (cfs).	0.00000	148.38912	0.00000	0.00000	78.16195	0.00000
Impervious Area with depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Area without depression storage						

Total Runoff Depth (in)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Peak Runoff Rate (cfs).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total Area						

Total Runoff Depth (in)	2.54184	5.76495	2.00659	2.76530	5.76166	2.00544
Peak Runoff Rate (cfs).	84.37480	148.38912	64.73512	133.26034	78.16195	18.20412
Unit Runoff (in/hr)....	1.82471	4.52130	1.86664	2.30156	4.57087	1.97014
Rational Formula						

Pervious Tc. (mins)....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Perv. Intensity (in/hr)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Pervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious Tc. (mins)..	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Imp. Intensity (in/hr).	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Impervious C	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area (Ha).....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Tc.....	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Partial Area Intensity.	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Subcatchment.....	D-S_M2#2	D-S_N1.1#1	D-S_N1.1#2
Area (acres).....	85.03900	2.47000	13.36200
Percent Impervious.....	0.00000	100.00000	0.00000
Total Rainfall (in)....	6.00000	6.00000	6.00000
Max Intensity (in/hr)..	4.56000	4.56000	4.56000
Pervious Area			

Total Runoff Depth (in)	2.66342	0.00000	2.32930

```
Total Losses (in)......          3.33658          0.00000          3.67070
Remaining Depth (in)...          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).        158.16037          0.00000         21.32593
Total Impervious Area
---------------------
Total Runoff Depth (in)          0.00000          5.79487          0.00000
Peak Runoff Rate (cfs).          0.00000          9.14236          0.00000
Impervious Area with depression storage
---------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
Impervious Area without depression storage
------------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
Total Area
----------
Total Runoff Depth (in)          2.66342          5.79487          2.32930
Peak Runoff Rate (cfs).        158.16037          9.14236         21.32593
Unit Runoff (in/hr)....          1.85986          3.70136          1.59601
Rational Formula
----------------
Pervious Tc. (mins)....          0.00000          0.00000          0.00000
Perv. Intensity (in/hr)          0.00000          0.00000          0.00000
Pervious C ............          0.00000          0.00000          0.00000
Impervious Tc. (mins)..          0.00000          0.00000          0.00000
Imp. Intensity (in/hr).          0.00000          0.00000          0.00000
Impervious C ..........          0.00000          0.00000          0.00000
Partial Area (Ha)......          0.00000          0.00000          0.00000
Partial Area Tc........          0.00000          0.00000          0.00000
Partial Area Intensity.          0.00000          0.00000          0.00000

===> Runoff simulation ended normally.


*=====================================================*
|        Table E10 - CONDUIT SUMMARY STATISTICS       |
| Note: The peak flow may be less than the design flow |
| and the conduit may still surcharge because of the   |
| downstream boundary conditions.                      |
|                                                      |
| * denotes an open conduit that has been overtopped   |
|   this is a potential source of severe errors        |
*=====================================================*
```

Conduit Name	Design Flow (cfs)	Conduit Design Velocity (ft/s)	Maximum Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Upstream (ft)	Depth Ends Dwnstrm (ft)	Ratio d/D US	Ratio d/D DS	
N_Link2	768.8495	2.5628	120.0000	413.6553	13	44	3.1355	12	38	0.5380	875.7738	875.6484	.7774	.7848	
N_Link1	1746.275	5.8209	120.0000	611.8800	16	39	2.8150	17	28	0.3504	875.5130	875.5801	.9013	1.058	*
M_Link3	1360.783	4.5359	120.0000	1047.258	13	48	3.5492	13	43	0.7696	875.5801	874.4448	1.058	1.144	*
M_Link2	754.4772	2.5149	120.0000	1045.375	14	6	3.4846	14	6	1.3856	874.2665	872.3521	1.176	1.085	*
M_Link1	1332.969	4.4432	120.0000	1043.220	14	10	5.8012	14	9	0.7826	869.7748	864.1381	.8775	.5138	
M_Link0	2772.126	9.2404	120.0000	1046.988	14	11	8.7100	14	12	0.3777	864.1216	862.0234	.6122	.5023	
Runoff_N1	397.6640	4.9708	48.0000	271.5123	13	2	3.6912	12	31	0.6828	875.6602	875.6484	1.715	1.962	*
Runoff_M2	397.6640	4.9708	48.0000	153.1437	12	45	1.9143	12	45	0.3851	874.4492	874.4448	2.612	2.861	*
S_Link5	924.5090	11.5564	48.0000	274.5808	12	48	5.1070	12	48	0.2970	914.7854	893.2754	.5963	1.318	*
S_Link4	14789.99	7.3898	128.4000	1144.317	13	19	2.1165	12	35	0.0774	893.2754	887.4703	.4930	.6982	
S_Link3	31616.76	5.6502	204.0000	1156.725	13	30	2.2962	13	4	0.0366	887.4703	884.8158	.4394	.5362	
S_Link2	5144.586	4.2842	138.0000	1264.018	13	42	4.4415	13	3	0.2457	884.8158	877.9341	.7927	.8377	
S_Link1	2559.189	8.5306	120.0000	1096.208	13	48	4.7581	13	39	0.4283	876.1616	875.5801	.8162	1.058	*
S_Link6	17774.31	8.8809	128.4000	774.1420	13	11	2.8975	13	7	0.0436	912.1083	893.2754	.4307	.4930	
Runoff_S1	397.6640	4.9708	48.0000	131.2923	12	38	1.6411	12	38	0.3302	884.8198	884.8158	2.030	2.278	*
Runoff_S2	397.6640	4.9708	48.0000	215.4046	12	43	3.1466	12	37	0.5417	893.3125	893.2754	1.078	1.318	*
Runoff_S3	397.6640	4.9708	48.0000	82.6412	12	42	2.4920	12	38	0.2078	912.1208	912.1083	.7802	1.027	*
S_Link10	2845.702	9.4857	120.0000	716.3641	12	58	6.6608	12	57	0.2517	942.9075	933.2316	.5308	.5232	
S_Link9	3117.276	10.3909	120.0000	777.8345	13	0	5.6024	13	0	0.2495	933.2316	925.4558	.5232	.7256	
S_Link8	2222.646	7.4088	120.0000	776.1358	13	2	5.2184	13	1	0.3492	923.8914	921.8285	.6191	.6829	
S_Link7	2600.485	8.6683	120.0000	769.9402	13	5	6.7866	13	5	0.2961	920.8745	912.2714	.6274	.4271	
Runoff_S4	397.6640	4.9708	48.0000	71.6311	13	4	1.7147	1	18	0.1801	933.2641	933.2316	1.066	1.307	*
S_Link12	927.9977	11.6000	48.0000	110.1480	12	42	5.1243	12	39	0.1187	979.3819	955.4951	.3955	.8738	
S_Link11	1127.020	14.0877	48.0000	715.7736	12	55	10.1437	12	55	0.6351	955.4951	949.0467	.8738	2.261	*
S_Link14	527.8312	6.5979	48.0000	462.5537	13	16	7.0284	13	10	0.8763	986.9404	975.1373	1.485	.7843	*
S_Link13	834.3540	10.4294	48.0000	451.4471	13	19	8.9298	13	19	0.5411	975.1373	955.4951	.7843	.8738	
Runoff_S6	397.6640	4.9708	48.0000	156.5768	12	46	2.7622	12	35	0.3937	987.0053	986.9404	1.251	1.485	*
Runoff_S5	397.6640	4.9708	48.0000	218.4811	12	51	4.6557	12	40	0.5494	956.1563	955.4951	.7891	.8738	
Runoff_S8	397.6640	4.9708	48.0000	112.8752	13	10	2.4848	1	21	0.2838	987.0201	986.9404	1.255	1.485	*
Runoff_S7	397.6640	4.9708	48.0000	179.0262	12	57	2.2378	12	57	0.4502	987.3642	987.1918	1.516	1.722	*

Runoff_S9	397.6640	4.9708	48.0000	64.4609	12	41	1.0522	12	42	0.1621	983.1886	983.1489	.7471	.9872	
Runoff_US1	397.6640	4.9708	48.0000	86.2915	12	37	3.8682	12	37	0.2170	915.9815	914.7854	.5454	.4963	
S_Link15	549.9294	6.8741	48.0000	128.9869	13	28	2.5341	13	28	0.2346	910.1501	893.2754	.5375	1.318	*
S_link16	539.1589	6.7395	48.0000	5.8200	18	33	0.8148	26	35	0.0108	912.4825	910.4247	.1206	.7312	
Runoff_S10	397.6640	4.9708	48.0000	254.0847	12	53	5.1969	12	53	0.6389	914.3705	912.5675	.8426	.6419	
Runoff_S11	397.6640	4.9708	48.0000	113.5647	12	47	4.7681	12	38	0.2856	918.6023	916.4024	.6506	.3506	
N_Link6	741.0031	9.2625	48.0000	161.5085	12	55	2.3558	16	40	0.2180	900.1901	900.1758	1.147	1.219	*
N_Link5	621.1634	7.7645	48.0000	161.1088	12	56	4.0525	12	36	0.2594	896.7477	893.4525	.5619	1.363	*
N_Link3	1899.861	6.3329	120.0000	757.8061	13	39	5.0546	13	34	0.3989	890.8472	875.8841	.6847	.7384	
N_Link7	1814.427	7.5601	72.0000	170.2227	12	51	2.9030	12	41	0.0938	895.7025	895.6970	.3504	.6162	
N_Link9	4565.759	10.1461	72.0000	524.4094	13	9	3.3925	13	6	0.1149	906.7689	895.7736	.2615	.4623	
N_Link8	1876.839	7.8202	72.0000	208.8810	12	39	3.2736	12	39	0.1113	900.3773	896.3676	.2296	.4046	
Runoff_N2	397.6640	4.9708	48.0000	339.0257	12	43	5.1496	12	35	0.8525	875.8910	875.8841	1.597	1.846	*
Runoff_N3	397.6640	4.9708	48.0000	198.8532	12	39	6.0820	12	39	0.5001	903.2079	900.3773	.8020	.3443	
Runoff_N8	397.6640	4.9708	48.0000	111.5203	13	27	3.6964	1	22	0.2804	895.8591	895.6970	.7148	.9243	
Runoff_N5	397.6640	4.9708	48.0000	71.4867	13	7	2.6774	1	19	0.1798	911.4860	911.4535	1.071	1.313	*
NonameRd	330.4296	16.5215	48.0000	144.4042	12	48	14.1007	12	36	0.4370	944.9353	944.3071	.4838	.8268	
N_Link11.1	135.9893	11.3324	36.0000	184.3567	13	9	15.4436	13	36	1.3557	944.3071	943.1843	1.102	.9614	
N_Link11	6060.385	20.2013	120.0000	448.9643	12	59	10.1599	12	59	0.0741	943.1843	923.5495	.2884	.2750	
LacyRd_N3b	1010.039	34.2386	58.0000	120.1603	12	39	10.7490	17	3	0.1190	923.5495	920.8423	.5689	.9191	
LacyRd_N3a	99.7666	6.2729	54.0000	76.6796	12	39	7.8853	12	39	0.7686	920.8391	917.7769	.9865	.4393	
N_Link10	2664.101	8.8803	72.0000	459.3794	13	0	2.8863	12	46	0.1724	917.7769	911.4535	.3295	.8756	
Runoff_N6	397.6640	4.9708	48.0000	61.6854	12	43	3.2617	12	37	0.1551	945.8088	944.9353	.4522	.4838	
Roff_US_N1	397.6640	4.9708	48.0000	90.5862	12	35	3.9238	12	35	0.2278	1007.228	1005.570	.5570	.3925	
N_Link14	882.1389	11.0267	48.0000	83.2596	12	41	3.2745	12	40	0.0944	1001.923	978.7043	.3557	.6761	
Roff_US_N2	397.6640	4.9708	48.0000	123.5760	12	33	4.2748	12	33	0.3108	1025.528	1023.825	.6321	.4564	
N_Link16	1152.523	14.4065	48.0000	122.1000	12	35	6.1985	12	19	0.1059	1020.501	978.7043	.3753	.6761	
Runoff_N7	397.6640	4.9708	48.0000	25.3343	12	38	2.4737	12	34	0.0637	923.5590	923.5495	.4398	.6874	
N_Link12	5261.284	12.1236	72.0000	203.2694	12	42	5.4607	12	43	0.0386	978.7043	949.8226	.4507	.3121	
N_Link12.1	1336.358	4.1595	36.0000	346.3591	12	44	2.9559	1	13	0.2592	949.8226	944.9353	.6242	.6451	
Runoff_N2.	397.6640	4.9708	48.0000	40.2333	12	32	2.8321	12	30	0.1012	890.8491	890.8472	1.462	1.711	*
Runoff_N1.	397.6640	4.9708	48.0000	29.1479	12	43	2.4523	12	33	0.0733	864.1384	864.1381	1.034	1.284	*
N_Link4	2433.847	8.1128	120.0000	742.8895	13	29	5.4833	13	1	0.3052	893.4678	890.8472	.5768	.6847	
RR_br	3495.292	17.4765	120.0000	742.9542	13	29	6.6408	13	28	0.2126	893.4525	893.4678	.5452	.5768	
Link120	397.6640	4.9708	48.0000	214.5134	12	32	5.4068	12	21	0.5394	1010.229	1008.291	.8073	.5727	
N_Combine	397.6640	4.9708	48.0000	144.0195	13	8	4.5435	13	11	0.3622	946.7116	944.9353	.6779	.4838	
Link124	397.6640	4.9708	48.0000	337.5972	12	35	6.7977	12	25	0.8490	1009.923	1007.071	.9807	.5178	
Link128	397.6640	4.9708	48.0000	185.2687	12	35	5.1454	12	34	0.4659	1009.076	1006.739	.7689	.4348	
N_Combine.	397.6640	4.9708	48.0000	137.8086	12	45	3.8092	12	42	0.3465	943.8506	943.1843	.6377	.7211	
Link156	397.6640	4.9708	48.0000	225.4516	12	32	5.6305	12	18	0.5669	1006.343	1003.801	.8357	.4502	
Link160	397.6640	4.9708	48.0000	58.2507	12	31	3.2358	12	31	0.1465	1010.786	1009.553	.4465	.3881	
Link152	397.6640	4.9708	48.0000	397.3694	12	33	6.7491	12	33	0.9993	1010.266	1007.488	1.066	.6221	*
SE2_Link	397.6640	4.9708	48.0000	227.2026	12	49	5.0435	12	49	0.5713	917.0250	915.2367	.8062	.6092	
Link148	397.6640	4.9708	48.0000	129.3456	12	44	3.9097	12	42	0.3253	1007.497	1006.329	.6244	.5823	
Link144	397.6640	4.9708	48.0000	211.8317	12	33	5.3622	12	32	0.5327	1008.243	1005.843	.8107	.4608	
Link140	397.6640	4.9708	48.0000	96.1955	12	32	3.8772	12	17	0.2419	1008.226	1006.922	.5564	.4804	
Link132	397.6640	4.9708	48.0000	266.9165	12	33	5.7241	12	32	0.6712	1009.543	1007.072	.8857	.5181	
Link136	397.6640	4.9708	48.0000	170.2405	12	35	4.7350	12	27	0.4281	1008.870	1007.377	.7174	.5942	
Link166	397.6640	4.9708	48.0000	68.7708	13	17	2.4668	13	25	0.1729	978.9299	978.7043	.4825	.6761	
Link167	397.6640	4.9708	48.0000	131.9247	12	50	1.6526	12	50	0.3317	901.2920	901.1823	.9980	1.220	*
Link169	397.6640	4.9708	48.0000	51.7425	13	19	1.6464	15	50	0.1301	900.1986	900.1901	.8997	1.147	*
Link170	397.6640	4.9708	48.0000	30.0387	12	54	0.8389	12	39	0.0755	877.9361	877.9341	2.159	2.408	*
Link171	397.6640	4.9708	48.0000	87.7867	12	52	1.0973	12	52	0.2208	887.4885	887.4703	1.622	1.867	*
Link172	397.6640	4.9708	48.0000	110.1498	12	53	1.4908	12	52	0.2770	893.3003	893.2754	1.075	1.318	*
Link174	397.6640	4.9708	48.0000	47.7688	12	39	0.7829	12	39	0.1201	983.1698	983.1489	.7425	.9872	
Link175	397.6640	4.9708	48.0000	76.4399	13	0	0.9555	13	0	0.1922	987.2283	987.1918	1.482	1.722	*
USH14_NCul	480.7420	5.7231	72.0000	208.8012	13	43	2.3342	13	32	0.4343	875.8841	875.7738	1.280	1.295	
LacyN1_Cul	1194.894	16.5957	72.0000	305.1053	16	40	4.1000	15	57	0.2553	875.6484	875.5130	1.308	1.502	
280.1	172.5733	4.7937	72.0000	224.3379	12	35	7.4364	12	34	1.3000	874.4448	874.2665	1.907	1.961	
Lacy_MCulv	919.4830	9.2877	66.0000	989.3280	14	5	9.9533	14	5	1.0760	872.3521	869.7748	1.973	1.595	
284.1	2000.067	14.6525	78.0000	1046.985	14	11	8.9337	14	11	0.5235	864.1381	864.1216	.7905	.9418	
USH14_SCul	293.0837	6.1059	72.0000	463.4555	13	36	9.2964	13	38	1.5813	877.9341	876.1616	1.605	1.360	
EHill_Culv	255.7928	13.0274	60.0000	211.6365	12	57	11.7593	12	41	0.8274	949.0467	942.9075	1.809	1.061	
SyeneS1Cul	125.3272	7.0806	45.0000	291.5104	12	48	16.4567	12	48	2.3260	925.4558	923.8914	1.934	1.651	
Irish1Culv	83.8758	5.5917	36.0000	131.7153	12	50	8.4316	12	49	1.5704	921.8285	920.8745	2.276	2.091	
Irish2Culv	33.9380	6.9138	30.0000	33.2637	12	42	7.9579	12	40	0.9801	983.1489	979.3819	1.579	.6328	
Irish3Culv	92.2134	5.7633	24.0000	-118.803	13	46	-7.3772	13	46	-1.2883	987.1918	986.9404	3.095	3.320	
RR_S3Culv	256.8162	17.1211	60.0000	44.5661	13	44	10.2767	13	25	0.1735	916.4024	912.4865	.2805	.4973	
Irish0Culv	1.9395	0.0000	24.0000	40.7610	12	55	3.3010	12	54	21.0159	910.4247	910.1501	1.462	1.325	
SyeneN1_Cu	45.5304	6.5043	31.0000	53.7663	12	38	7.9136	12	38	1.1809	901.1823	900.1901	1.889	1.776	
LacyN2_Cul	41.4675	5.9239	31.0000	89.2804	12	54	13.2726	12	45	2.1530	900.1758	896.7477	1.887	.8701	
SyeneN2_Cu	259.2403	7.8124	78.0000	171.0378	14	27	5.2646	14	32	0.6598	894.1758	893.4525	1.104	1.146	
SyeneN1_C	253.8520	7.9329	48.0000	85.3066	12	50	5.3003	12	51	0.3360	896.3676	895.7025	.6069	.5231	
JonesFrm_C	443.6945	13.8655	48.0000	262.3466	13	7	11.2724	13	7	0.5913	911.4535	906.7689	1.313	.3922	
592.1	21.8107	12.3423	18.0000	44.3168	12	27	25.2070	12	23	2.0319	1022.474	1020.501	1.982	1.000	
SwnCrNout	0.0000	0.0000	48.0000	19.0000	17	22	10.0000	17	22	0.0000	895.6970	895.6775	.9243	.9194	
SwnCkSout	0.0000	0.0000	36.0000	7.0000	12	28	4.0000	12	28	0.0000	895.7736	895.6775	.9245	.8925	
NW1_vweir	0.0000	0.0000	0.0000	68.7389	13	17	18.2599	13	17	0.0000	977.0000	977.0000	.0000	.0000	
N1_vweir	0.0000	0.0000	0.0000	116.7091	13	8	25.0864	13	8	0.0000	944.0000	944.0000	.0000	.0000	
N2_vweir	0.0000	0.0000	0.0000	113.5814	12	45	24.6809	12	45	0.0000	941.3000	941.3000	.0000	.0000	

SW2_vweir	0.0000	0.0000	0.0000	76.6913	13	0	19.4995	13	0	0.0000	981.3000	981.3000	.0000	.0000
SW1_vweir	0.0000	0.0000	0.0000	47.5808	12	39	14.6432	12	39	0.0000	980.2000	980.2000	.0000	.0000
SE2_vweir	0.0000	0.0000	0.0000	159.6471	12	49	187128.9	12	58	0.0000	913.8000	913.8000	.0000	.0000
SE1_vweir	0.0000	0.0000	0.0000	100.0799	12	53	22.8762	12	53	0.0000	889.0000	889.0000	.0000	.0000
E1_vweir	0.0000	0.0000	0.0000	88.9944	12	51	21.3203	12	51	0.0000	881.0000	881.0000	.0000	.0000
NE1_vweir	0.0000	0.0000	0.0000	33.5157	12	55	11.8666	12	55	0.0000	869.3000	869.3000	.0000	.0000
NE3_vweir	0.0000	0.0000	0.0000	110.6378	12	50	24.2951	12	50	0.0000	897.3000	897.3000	.0000	.0000
NE2_vweir	0.0000	0.0000	0.0000	51.4289	13	18	15.3427	13	18	0.0000	896.6000	896.6000	.0000	.0000
1.25in	0.0221	0.8025	1.2498	0.1175	12	27	12.3015	12	26	5.3263	1003.963	1001.923	33.25	13.76
3.25in	0.2405	0.8025	3.2497	0.7082	12	33	19.6236	12	29	2.9440	1003.963	1001.923	9.096	1.598
USH14_NOvr	Undefnd	Undefnd	Undefn	0.0000	0	0								
LacyN1_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
PrivateDr	Undefnd	Undefnd	Undefn	951.4748	14	59								
Lacy_MOvr	Undefnd	Undefnd	Undefn	54.3116	14	9								
MM_ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
USH14_SOvr	Undefnd	Undefnd	Undefn	273.4026	13	57								
EHill_Ovr.1	Undefnd	Undefnd	Undefn	500.1437	12	57								
SyeneS1_Ovr	Undefnd	Undefnd	Undefn	553.9607	13	1								
irish1_Ovr.1	Undefnd	Undefnd	Undefn	618.1586	13	3								
Irish2Ovr	Undefnd	Undefnd	Undefn	78.1965	12	40								
Irish3Ovr	Undefnd	Undefnd	Undefn	199.7083	13	5								
RR_S3_Ovr	Undefnd	Undefnd	Undefn	0.0000	0	0								
irish0_Ovr.1	Undefnd	Undefnd	Undefn	71.2592	13	24								
SyeneN1_Ov	Undefnd	Undefnd	Undefn	98.7101	12	51								
LacyN2_Ovr	Undefnd	Undefnd	Undefn	72.2289	12	55								
SyeneN2_Ov	Undefnd	Undefnd	Undefn	325.3231	13	31								
SyeneN1_Ov.1	Undefnd	Undefnd	Undefn	0.0000	0	0								
JonesFrm_O	Undefnd	Undefnd	Undefn	0.0000	0	0								
Lacy_N3_Ov.1	Undefnd	Undefnd	Undefn	279.5504	12	58								
StandPipe	Undefnd	Undefnd	Undefn	43.3562	12	39								
QuarryOvr	Undefnd	Undefnd	Undefn	41.0035	12	39								
NobelWeir	Undefnd	Undefnd	Undefn	79.1295	12	34								
SwnCrWeirN	Undefnd	Undefnd	Undefn	166.3266	13	56								
SwanCkSout.1	Undefnd	Undefnd	Undefn	517.0107	13	5								
Weir10	Undefnd	Undefnd	Undefn	403.2302	13	31								
weir11	Undefnd	Undefnd	Undefn	21.7648	13	31								
weir14	Undefnd	Undefnd	Undefn	31.7389	13	31								
weirtop	Undefnd	Undefnd	Undefn	165.9336	13	31								
RR_S4out	Undefnd	Undefnd	Undefn	5.8209	18	27								
NW1_Iweir	Undefnd	Undefnd	Undefn	124.6252	12	42								
NW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
N1_Iweir	Undefnd	Undefnd	Undefn	256.0171	12	44								
N1_ovrweir	Undefnd	Undefnd	Undefn	27.3939	13	8								
N2_Iweir	Undefnd	Undefnd	Undefn	179.3322	12	37								
N2_ovrweir	Undefnd	Undefnd	Undefn	24.2886	12	45								
SW2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SW2_Iweir	Undefnd	Undefnd	Undefn	192.8928	12	36								
SW1_Iweir	Undefnd	Undefnd	Undefn	56.1484	12	34								
SW1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
SE2_Iweir	Undefnd	Undefnd	Undefn	364.4795	12	37								
SE2_ovweir	Undefnd	Undefnd	Undefn	67.6127	12	49								
SE1_Iweir	Undefnd	Undefnd	Undefn	128.6665	12	45								
SE1_ovweir	Undefnd	Undefnd	Undefn	11.9339	12	53								
E1_Iweir	Undefnd	Undefnd	Undefn	202.3626	12	36								
E1_ovrweir	Undefnd	Undefnd	Undefn	3.7794	12	51								
NE1_Iweir	Undefnd	Undefnd	Undefn	88.1407	12	35								
NE1_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NE3_Iweir	Undefnd	Undefnd	Undefn	256.3343	12	36								
NE2_Iweir	Undefnd	Undefnd	Undefn	133.7121	12	44								
NE3_ovweir	Undefnd	Undefnd	Undefn	21.4375	12	50								
NE2_ovweir	Undefnd	Undefnd	Undefn	0.0000	0	0								
NW1_inf	Undefnd	Undefnd	Undefn	1.5300	2	39								
N1_inf	Undefnd	Undefnd	Undefn	1.9500	2	37								
N2_inf	Undefnd	Undefnd	Undefn	1.3040	2	55								
SW2_inf	Undefnd	Undefnd	Undefn	1.2800	2	35								
SW1_inf	Undefnd	Undefnd	Undefn	0.5700	3	53								
SE2_inf	Undefnd	Undefnd	Undefn	0.9800	1	51								
SE1_inf	Undefnd	Undefnd	Undefn	0.0600	1	44								
E1_inf	Undefnd	Undefnd	Undefn	1.7600	3	41								
NE1_inf	Undefnd	Undefnd	Undefn	1.1600	4	40								
NE3_inf	Undefnd	Undefnd	Undefn	1.8300	2	47								
NE2_inf	Undefnd	Undefnd	Undefn	2.4100	4	48								
FREE # 1	Undefnd	Undefnd	Undefn	1046.988	14	11								

Table E12. Mean Conduit Flow Information								
	Mean	Total	Mean	Low	Mean	Mean	Mean	Mean

Conduit Name	Flow (cfs)	Flow (ft^3)	Percent Change	Flow Weightng	Froude Number	Hydraulic Radius	Cross Area	Conduit Roughness
N_Link2	62.3349	10771467.	0.0010	0.9760	0.3526	1.4891	47.9479	0.0500
N_Link1	74.0023	12787597.	0.0019	0.9941	0.1866	1.9028	70.9249	0.0500
M_Link3	152.0224	26269463.	0.0025	0.9857	0.2207	2.1973	87.9405	0.0500
M_Link2	156.7532	27086953.	0.0022	0.9466	0.2020	2.2644	92.5511	0.0500
M_Link1	156.6809	27074465.	0.0023	0.8886	0.4086	1.6492	54.7462	0.0500
M_Link0	157.6304	27238525.	0.0024	0.9974	0.7238	1.3433	36.2779	0.0500
Runoff_N1	10.9907	1899190.4	0.0008	0.9937	0.2534	0.7632	23.2739	0.0500
Runoff_M2	4.7555	821756.27	0.0006	0.6827	0.0185	1.1610	38.5039	0.0500
S_Link5	10.9831	1897876.5	0.0002	0.9980	0.1196	0.7354	17.9240	0.0300
S_Link4	68.9042	11906649.	0.0015	0.9975	0.1585	0.8206	108.8686	0.0500
S_Link3	72.8505	12588565.	0.0016	0.9965	0.1637	0.9067	71.9463	0.0500
S_Link2	76.6985	13253503.	0.0023	0.9953	0.4653	0.9585	44.2080	0.0500
S_Link1	78.0518	13487358.	0.0020	0.9756	0.2207	1.6889	60.4869	0.0500
S_Link6	37.0408	6400654.8	0.0009	0.9985	0.1982	0.5573	38.6436	0.0500
Runoff_S1	3.3619	580944.46	0.0007	0.8048	0.0103	1.2699	40.8646	0.0500
Runoff_S2	6.1826	1068352.5	0.0006	0.8965	0.0343	1.0076	27.1334	0.0500
Runoff_S3	2.4162	417511.29	0.0003	0.9985	0.1306	0.6592	14.3245	0.0500
S_Link10	31.4992	5443068.6	0.0012	0.9904	0.4128	0.7050	13.8874	0.0500
S_Link9	34.6365	5985193.1	0.0008	0.9978	0.3997	0.8004	17.5809	0.0500
S_Link8	34.6427	5986258.4	0.0013	0.9934	0.3812	0.8489	19.1768	0.0500
S_Link7	34.5852	5976322.8	0.0012	0.9759	0.4828	0.8688	18.5920	0.0500
Runoff_S4	3.1359	541888.47	0.0002	0.9910	0.2099	0.4340	8.3901	0.0500
S_Link12	2.8696	495870.06	0.0001	0.7970	0.2544	0.2766	3.5306	0.0300
S_Link11	31.5150	5445785.0	0.0182	0.9985	0.5699	0.6343	14.2061	0.0300
S_Link14	21.1761	3659227.3	0.0008	0.9984	0.5973	0.5068	8.9949	0.0300
S_Link13	21.1322	3651638.7	0.0008	0.9883	0.7521	0.4270	6.5983	0.0300
Runoff_S6	4.9687	858587.89	0.0003	0.7867	0.1253	0.4250	7.7800	0.0500
Runoff_S5	7.4833	1293116.1	0.0004	0.9846	0.3095	0.4018	5.8076	0.0500
Runoff_S8	4.9819	860866.60	0.0003	0.9960	0.2145	0.4400	7.8393	0.0500
Runoff_S7	6.6201	1143957.9	0.0004	0.7831	0.0556	0.7158	15.6357	0.0500
Runoff_S9	1.7257	298198.43	0.0002	0.9305	0.1368	0.3279	5.7826	0.0500
Runoff_US1	2.0426	352955.74	0.0001	0.9985	0.6184	0.1967	2.0321	0.0500
S_Link15	10.6772	1845026.3	0.0002	0.7491	0.0974	0.7776	18.7798	0.0300
S_link16	1.7346	299735.12	0.0000	0.5908	0.0957	0.3841	5.7230	0.0300
Runoff_S10	8.9731	1550545.9	0.0004	0.9984	0.5954	0.3559	5.2531	0.0500
Runoff_S11	3.7919	655246.82	0.0002	0.9750	0.4604	0.2773	3.0052	0.0500
N_Link6	8.8888	1535978.3	0.0004	0.8235	0.3497	0.4696	10.0623	0.0300
N_Link5	8.8914	1536439.8	0.0002	0.8088	0.3042	0.4655	8.8360	0.0300
N_Link3	52.6219	9093065.9	0.0014	0.9985	0.3891	1.2613	34.4164	0.0500
N_Link7	5.3106	917672.75	0.0003	0.8761	0.0304	0.9847	43.6809	0.0300
N_Link9	30.9969	5356264.3	0.0007	0.9973	0.2071	0.8226	64.4713	0.0500
N_Link8	5.3171	918786.55	0.0003	0.9980	0.3545	0.3112	13.0820	0.0300
Runoff_N2	9.8878	1708615.0	0.0008	0.8041	0.2744	0.8277	24.8902	0.0500
Runoff_N3	5.3153	918485.34	0.0003	0.9695	0.5805	0.2577	3.3381	0.0500
Runoff_N8	6.6081	1141885.6	0.0002	0.8657	0.2869	0.7987	17.4114	0.0500
Runoff_N5	3.4042	588245.37	0.0003	0.9920	0.2789	0.4302	8.2687	0.0500
NonameRd	22.9154	3959788.7	0.0002	0.9978	1.6647	0.2857	1.9860	0.0140
N_Link11.1	22.8914	3955627.1	0.0003	0.9928	1.4240	0.3579	2.2803	0.0140
N_Link11	26.9226	4652216.9	0.0008	0.9838	1.0067	0.4866	7.6691	0.0500
LacyRd_N3b	19.7123	3406280.1	0.0004	0.9980	0.9646	0.5224	4.1654	0.0140
LacyRd_N3a	19.7100	3405887.3	0.0002	0.9979	1.0890	0.4413	2.3673	0.0140
N_Link10	27.5820	4766170.2	0.0005	0.9633	0.3300	0.5295	28.4712	0.0500
Runoff_N6	1.8312	316428.86	0.0001	0.9748	0.3361	0.2214	2.0723	0.0500
Roff_US_N1	2.3145	399940.74	0.0001	0.9986	0.5506	0.2275	2.1166	0.0500
N_Link14	2.1321	368431.84	0.0002	0.9414	0.1783	0.3275	4.0969	0.0300
Roff_US_N2	3.2224	556833.78	0.0002	0.9986	0.5464	0.2648	2.6669	0.0500
N_Link16	3.2364	559251.46	0.0001	0.9984	0.3345	0.3430	4.2203	0.0300
Runoff_N7	0.6616	114331.42	0.0001	0.9761	0.1304	0.2808	3.9295	0.0500
N_Link12	9.6768	1672153.4	0.0004	0.9954	0.6400	0.3442	4.3194	0.0500
N_Link12.1	13.6640	2361132.6	0.0006	0.9986	0.4517	0.2251	14.4432	0.0500
Runoff_N2.	1.0214	176503.58	0.0004	0.7932	0.1640	0.6845	16.0693	0.0500
Runoff_N1.	0.9555	165118.21	0.0001	0.9939	0.1816	0.7234	20.6109	0.0500
N_Link4	51.5689	8911101.5	0.0018	0.9207	0.3154	1.0557	24.0259	0.0500
RR_br	51.5652	8910473.7	0.0078	0.9209	0.4115	0.9671	24.5452	0.0300
Link120	5.7028	985446.27	0.0005	0.9986	0.4634	0.3884	4.6870	0.0500
N_Combine	7.4363	1284990.5	0.0002	0.7749	0.5162	0.3289	4.4055	0.0500
Link124	9.2840	1604283.3	0.0007	0.9986	0.5506	0.4306	5.6768	0.0500
Link128	4.8438	837012.19	0.0004	0.9986	0.4670	0.3322	3.6861	0.0500
N_Combine.	4.0293	696268.23	0.0002	0.8173	0.2212	0.3401	4.3657	0.0500
Link156	5.7803	998829.52	0.0003	0.9986	0.4769	0.3639	4.1787	0.0500
Link160	1.4597	252242.96	0.0001	0.9986	0.3878	0.2394	2.1258	0.0500
Link152	9.9671	1722315.4	0.0007	0.9986	0.4376	0.4443	5.9659	0.0500
SE2_Link	8.9195	1541285.0	0.0004	0.8486	0.4807	0.3785	5.2142	0.0500
Link148	3.9196	677313.43	0.0002	0.9985	0.2571	0.3466	3.8022	0.0500
Link144	5.4372	939551.46	0.0004	0.9986	0.4817	0.3437	3.9468	0.0500
Link140	2.4598	425061.63	0.0002	0.9986	0.3751	0.2774	2.7258	0.0500
Link132	6.9198	1195745.3	0.0005	0.9986	0.4574	0.3787	4.6337	0.0500

Link136	4.7458	820082.61	0.0003	0.9986	0.4992	0.3346	3.8802	0.0500
Link166	4.3172	746007.55	0.0001	0.7530	0.1812	0.4001	5.3236	0.0500
Link167	5.6622	978432.32	0.0002	0.8370	0.2453	0.4543	9.4591	0.0500
Link169	3.2317	558443.99	0.0001	0.7409	0.2015	0.3709	7.4880	0.0500
Link170	1.7385	300416.89	0.0002	0.7499	0.0539	0.7489	22.3647	0.0500
Link171	4.2795	739490.55	0.0002	0.8556	0.0145	1.2260	38.8792	0.0500
Link172	3.8255	661050.65	0.0002	0.9377	0.0249	1.0110	27.0225	0.0500
Link174	1.1303	195308.14	0.0002	0.7727	0.0978	0.3131	5.6275	0.0500
Link175	4.5645	788749.94	0.0004	0.7743	0.0521	0.7207	15.5934	0.0500
USH14_NCul	62.3515	10774334.	0.0005	0.9931	0.1354	1.2559	32.8552	0.0140
LacyN1_Cul	74.0038	12787861.	0.0010	0.9972	0.3584	0.9951	25.2900	0.0140
280.1	47.6532	8234469.5	0.0010	0.9536	0.3293	1.0874	18.4373	0.0500
Lacy_MCulv	155.4028	26853603.	0.0022	0.9054	0.3070	1.4434	48.2309	0.0240
284.1	157.6344	27239219.	0.0024	0.9980	0.5342	1.3748	39.9582	0.0240
USH14_SCul	73.9314	12775349.	0.0009	0.9939	0.4271	0.8469	15.3364	0.0140
EHill_Culv	22.1774	3832248.2	0.0004	0.9968	1.2983	0.5882	4.8655	0.0240
SyeneS1Cul	25.6020	4424025.5	0.0006	0.9941	0.9196	0.5904	5.2172	0.0240
Irish1Culv	23.7952	4111811.9	0.0004	0.9801	0.6263	0.4959	4.6592	0.0240
Irish2Culv	2.0595	355875.18	0.0001	0.9500	1.3346	0.2112	0.7464	0.0240
Irish3Culv	-8.6490	-1494550.	0.0003	0.9984	0.0076	0.6731	8.9303	0.0240
RR_S3Culv	3.7898	654877.55	0.0001	0.9973	0.9542	0.4120	2.6201	0.0240
Irish0Culv	9.2135	1592085.7	0.0001	0.9984	0.1384	0.6171	5.9405	0.0240
SyeneN1_Cu	4.1736	721202.81	0.0001	0.8257	0.6808	0.3411	1.8150	0.0240
LacyN2_Cul	7.8295	1352935.1	0.0002	0.8188	0.9770	0.3518	1.7189	0.0240
SyeneN2_Cu	35.7975	6185806.0	0.0005	0.9928	0.1895	1.1836	12.1530	0.0240
SyeneN1_C	5.3062	916913.88	0.0002	0.9329	0.7452	0.4433	4.6738	0.0140
JonesFrm_C	31.0033	5357368.5	0.0008	0.9985	1.4510	0.3777	4.4488	0.0140
592.1	2.5051	432879.84	0.0001	0.9984	3.4863	0.1725	0.3372	0.0140
SwnCrNout	5.9788	1033130.6	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
SwnCkSout	3.9374	680374.14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW1_vweir	4.3177	746091.14	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
N1_vweir	7.1401	1233813.3	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
N2_vweir	3.9085	675389.44	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
SW2_vweir	4.5617	788262.93	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
SW1_vweir	1.1290	195092.59	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
SE2_vweir	8.2504	1425673.2	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
SE1_vweir	3.7723	651858.94	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
E1_vweir	4.2713	738083.03	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
NE1_vweir	1.7384	300396.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE3_vweir	5.5178	953474.13	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
NE2_vweir	3.2293	558019.70	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
1.25in	0.0746	12895.777	0.0000	0.9978	4.9387	0.0250	0.0079	0.0009
3.25in	0.2533	43766.673	0.0000	0.7945	1.8066	0.0541	0.0444	0.0018
USH14_NOvr	0.0000	0.0000						
LacyN1_Ovr	0.0000	0.0000						
PrivateDr	109.1061	18853533.						
Lacy_MOvr	1.3073	225893.23						
MM_ovr	0.0000	0.0000						
USH14_SOvr	4.1277	713259.28						
EHill_Ovr.1	9.3045	1607819.4						
SyeneS1_Ovr	9.0341	1561099.0						
irish1_Ovr.1	10.8509	1875040.5						
Irish2Ovr	0.7994	138138.41						
Irish3Ovr	2.5393	438791.24						
RR_S3_Ovr	0.0000	0.0000						
irish0_Ovr.1	1.5176	262247.14						
SyeneN1_Ov	1.4889	257287.84						
LacyN2_Ovr	1.0595	183087.88						
SyeneN2_Ov	6.8745	1187909.9						
SyeneN1_Ov.1	0.0000	0.0000						
JonesFrm_O	0.0000	0.0000						
Lacy_N3_Ov.1	7.8687	1359705.1						
StandPipe	1.5238	263314.26						
QuarryOvr	0.2795	48296.316						
NobelWeir	0.7174	123971.19						
SwnCrWeirN	5.7797	998724.59						
SwanCkSout.1	26.7187	4616990.0						
Weir10	37.3781	6458935.1						
weir11	0.8771	151566.60						
weir14	0.9227	159448.16						
weirtop	3.4961	604130.09						
RR_S4out	1.7403	300731.40						
NW1_Iweir	4.4461	768291.67						
NW1_ovweir	0.0000	0.0000						
N1_Iweir	7.7050	1331427.2						
N1_ovrweir	0.2986	51600.355						
N2_Iweir	4.0991	708322.75						
N2_ovrweir	0.1204	20797.575						
SW2_ovweir	0.0000	0.0000						
SW2_Iweir	4.7569	821984.15						

```
 SW1_Iweir    1.1396 196917.70
SW1_ovweir    0.0000    0.0000
 SE2_Iweir    9.1760 1585607.1
SE2_ovweir    0.6632 114607.71
 SE1_Iweir    3.8700 668735.16
SE1_ovweir    0.0562 9708.2000
  E1_Iweir    4.4398 767200.63
E1_ovrweir    0.0145 2506.0381
 NE1_Iweir    1.8126 313219.41
NE1_ovweir    0.0000    0.0000
 NE3_Iweir    5.8711 1014517.7
 NE2_Iweir    3.3959 586804.05
NE3_ovweir    0.1448 25019.908
NE2_ovweir    0.0000    0.0000
   NW1_inf    1.2581 217392.72
    N1_inf    1.5849 273862.34
    N2_inf    0.7457 128851.73
   SW2_inf    1.0268 177435.17
   SW1_inf    0.3205 55388.447
   SE2_inf    0.7963 137600.25
   SE1_inf    0.0494 8530.1751
    E1_inf    1.0003 172850.00
   NE1_inf    0.6470 111805.86
   NE3_inf    1.0514 181686.22
   NE2_inf    1.3488 233071.87
  FREE # 1  157.6317 27238760.
```

Appendix 8A

Conservation Design Incentive System

At the March 17 McGaw Neighborhood Steering Committee, a system for providing incentives for conservation design was discussed. The Steering Committee recommends creating a system that provides an incentive for developments that:

- Protect natural features, viewsheds, and access to environmental resources
- Allow smaller lot size in exchange for larger common open spaces
- Provide a long-term land management plan
- Provide natural stormwater design wherever possible
- Utilize native landscaping
- Design shorter, narrower residential streets to minimize infrastructure and impervious surfaces
- Utilize pervious pavers and green roofs to minimize impact of development footprint

One important metric for conservation design principles is impervious surface ratios (ISRs). ISRs are included in the Plan as Table 5.9. In this table, conventional development is shown to range from 62% impervious surfaces in conventional , Residential 1 land uses, to 90% for Business Park. ISRs using conservation design principles are lower, ranging from 42% to 75%. These lower ratios are based on building over a smaller portion of the lot, such as 2-3 story residential buildings, rather than single-story ranch homes, and substituting pervious materials (such as pervious pavers) for asphalt and concrete.

Table 5.9: Typical Impervious Surface Ratios

Land Use Type	Percent Impervious Area (Conventional Development)	Percent Impervious Area (Conservation Development)
Residential (R1)	62%	42%
Residential (R2)	68%	42%
Transit-Oriented Development (TOD)	84%	68%
Mixed Use (MU)	85%	69%
Business Park (BP)	90%	75%

A system was developed by the Consultant Team to provide an incentive to those developments that meet the Conservation Development ISRs. Under this proposal, minimum and maximum Floor Area Ratios (FARs) would be designated in the Plan. Maximum FARs would apply to all conventional development. Those developments that met the lower, Conservation Development ISRs, however, would be waived from the maximum FARs. See table A-8,.1 below.

Table A-8.1

Area	Min. FAR	Max. FAR (waived if meets Conservation Design ISR)
R1 (min. ave. 5 du/acre)	.34	.46
R2 or MU residential (min. ave. 10 du/acre)	.57	.69
TOD Residential (min. ave. 18 du/acre)	.62	.83
TOD and MU Office and Retail	.5	None, but must meet ISR

The Steering Committee voted to recommend that a system of incentives be created to reward Conservation Developments, but did not want to impose a maximum FAR within the Plan. It recommended that the issue of incentives be taken up in by Zoning after adoption of the Plan.

Options include:

- Reduction in Open Space Ratios on lots in exchange for common open space
- Height bonuses for buildings meeting Conservation Development ISRs
- Continuing to work on a system of additional FAR in exchange for Conservation Development ISRs

Appendix 9A

TRAFFIC IMPACT ANALYSIS FOR:

THE MCGAW PARK NEIGHBORHOOD PLAN

CITY OF FITCHBURG, DANE COUNTY, WISCONSIN

DATE SUBMITTED: May 8, 2009

PREPARED FOR:
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"I certify that this Traffic Impact Analysis has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering."

_____
Michael May, P.E., PTOE
Wisconsin Registration #37622-006
Traffic Analysis & Design, Inc.

McGaw Park Neighborhood Plan
Traffic Impact Analysis
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CHAPTER I – INTRODUCTION & EXECUTIVE SUMMARY

PART A – PURPOSE OF REPORT AND STUDY OBJECTIVES

The McGaw Park Neighborhood (MPN) is comprised of a large area of land within the south side of the City of Fitchburg urban boundary in Dane County, Wisconsin. Based on a traffic impact analysis (TIA) scope outlined by the City of Fitchburg, Traffic Analysis & Design, Inc. has conducted this TIA to determine the expected weekday morning and weekday evening peak hour operating conditions and recommendations at identified study area intersections.

This report documents the procedures, findings and conclusions of the TIA. The analysis identifies recommended improvements based on existing intersection geometrics, background traffic volumes, and additional traffic expected to be generated by the MPN.

PART B – BASE INFORMATION

B1. Location of Study Site with Respect to Area Roadway Network

The MPN comprises the majority of land west of United States Highway (USH) 14, east of Fish Hatchery Road, south of Lacy Road and north of Irish Lane. A copy of the MPN growth model is shown in Exhibit 1-1 at the end of this chapter.

A diagram illustrating the study area roadway network and intersections is shown in Exhibit 1-2. The following is an outline of the existing and proposed intersections included in this TIA. An asterisk (*) next to an existing intersection indicates that turning movement counts were not conducted at the intersection.

Existing Intersections for Study:

- Fish Hatchery Road & East Cheryl Parkway (traffic signal control)
- East Cheryl Parkway & Research Park Drive (two-way stop control)
- East Cheryl Parkway & Syene Road (two-way stop control) *
- Fish Hatchery Road & Lacy Road (traffic signal control)
- Lacy Road & Research Park Drive (two-way stop control)
- Lacy Road & Mica Road (two-way stop control)
- Lacy Road & Fahey Glen (two-way stop control)
- Lacy Road & Notre Dame Drive (two-way stop control) *
- Lacy Road & Jones Farm Drive (two-way stop control) *
- Lacy Road & Syene Road (two-way stop control)
- Fish Hatchery Road & Nobel Drive (two-way stop control)
- Nobel Drive & Research Park Drive (two-way stop control)
- Fish Hatchery Road & Irish Lane (two-way stop control)
- Irish Lane & East Hill Drive (two-way stop control)
- Irish Lane & Syene Road (two-way stop control).

Future Intersections for Study:

- East Cheryl Parkway & Fahey Glen (roundabout footprint exists)

- Interchange Road (a.k.a. New Lacy Road) & East Cheryl Parkway
- Interchange Road & USH 14 Southbound Ramps
- Interchange Road & USH 14 Northbound Ramps
- Lacy Road & Interchange Road/Nobel Drive
- Nobel Drive & Mica Road
- Nobel Drive & Fahey Glen
- Nobel Drive & Notre Dame Drive
- Nobel Drive & Syene Road.

The City of Fitchburg is planning to have several roadway projects undertaken within the study area regardless of the development of the MPN.

1. *Improvement of Fish Hatchery Road*. Fish Hatchery Road, also designated as County Trunk Highway (CTH) D, has a four lane divided cross-section north of Lacy Road, then tapers to a two-lane undivided facility south of Lacy Road. Fish Hatchery Road is planned for improvement to a two-lane divided cross-section to south of Nobel Drive in the Year 2009. A multi-use trail will be provided along the west side of the highway, and turn lanes will be added at the Fish Hatchery Road intersection with Irish Lane.
2. *Improvement of Lacy Road*. The City of Fitchburg plans to redesign Lacy Road from the City Community Center east to Fahey Glen in the Year 2011. Design has not yet begun, but the City indicates that the intent at this time is to design an improved two-lane cross-section similar to that which exists in front of City Hall with a center turn lane only at Mica Road. The intent is to construct a roundabout at the Lacy Road intersection with Fahey Glen.
3. *Construction of New USH 14 Interchange*: A new USH 14 interchange is being planned by the City of Fitchburg. The plan is to maintain the existing Syene Road intersection with Lacy Road. East of the intersection, the plan is to realign Lacy Road north to the new diamond interchange approximately 3,200-feet north of the existing Lacy Road overpass. This new roadway is referred to as both "New Lacy Road" and "Interchange Road." Due to spacing constraints, the plan is to eliminate the USH 14 northbound off-ramp and USH 14 southbound on-ramp at the existing McCoy Road interchange further north. Construction is anticipated in Year 2010.

The City of Fitchburg plans to connect Fahey Glen from Lacy Road to an existing roundabout footprint located along East Cheryl Parkway, as well as connect Notre Dame Drive from Lacy Road north to East Cheryl Parkway, at a future date.

B2. On-Site MPN Growth Model Description

According to Teska Associates, Inc., the following development is anticipated within the MPN. The numbers listed match the area numbers shown in the MPN growth model (Exhibit 1-1). The *italicized* land uses are land uses which are assumed to generate negligible volumes of traffic to/from the MPN. Note that all figures are approximate based on long-term planning assumptions. Actual densities may change for individual areas based on market forces and future implementation.

1. Business Park, 51 acres (approx. 788,653.8 square feet (sf));
2. *Environmentally Sensitive Area, 8 acres;*

3. Mixed Use, 57 acres (approx. 440,718.3-sf of office and 202 multi-family units);
4. Residential with 5 to 10 du/acre, 14 acres (approx. 99 multi-family units);
5. Institutional, 10 acres (assumed elementary school with approx. 625 students);
6. Residential with below 5 du/acre, 53 acres (approx. 188 single-family units);
7. *Parks & Open Space, 6 acres;*
8. Residential with below 5 du/acre, 35 acres (approx. 124 single-family units);
9. *Environmentally Sensitive Area, 9 acres;*
10. *Environmentally Sensitive Area, 67 acres;*
11. Business Park, 36 acres (approx. 556,696.8 sf);
12. Transit Oriented Development, 57 acres (approx. 270,616.5 sf office, 69,587.1 sf retail, and 447 multi-family units);
13. Transit Station, 5 acres (approx. 128 parking spaces per acre on 3 of the available 5 acres);
14. *Environmentally Sensitive Area, 3 acres;*
15. Transit Oriented Development, 19 acres (approx. 90,205.5 sf office, 23,195.7 sf retail, and 149 multi-family units);
16. Residential with 5 to 10 du/acre, 10 acres (approx. 71 multi-family units);
17. *Environmentally Sensitive Area, 8 acres;*
18. Residential with below 5 du/acre, 22 acres (approx. 78 single-family units);
19. *Environmentally Sensitive Area, 5 acres;*
20. Mixed Use, 4 acres (approx. 30,927.6-sf of office and 15 multi-family units);
21. Residential with below 5 du/acre, 13 acres (approx. 47 single-family units);
22. Residential with 5 to 10 du/acre, 66 acres (approx. 469 multi-family units);
23. *Parks & Open Space, 49 acres;*
24. *Parks & Open Space, 32 acres.*

In total, including approximately 73 acres of land assumed for right-of-way, the MPN has a planned area of approximately 712 acres.

The MPN developable area has been divided into three phases:

- Phase One, assumed to be complete around Year 2015, is to include the following build-out: 40-percent of area 1 and 15; 30-percent of areas 11 and 12; 60-percent of area 16; 100-percent of areas 17, 18, 20 and 21; 15-percent of area 22; 80-percent of area 23; and 20-percent of area 24.
- Phase One PLUS Phase Two, assumed to be complete around Year 2025, is to include the following buildout: 100-percent of areas 1, 2, 5, 7, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 23; 80-percent of areas 3, 12 and 24; 30-percent of area 6; 40-percent of area 8; and 60-percent of areas 11 and 22.

- Phase One PLUS Phase Two PLUS Phase Three, assumed to be complete around Year 2035, is to include the full build-out of the entire MPN.

The years shown are approximate for the purpose of the traffic analysis. Year 2025 and Year 2035 traffic analyses have been included in this TIA along with an analysis of Year 2008 existing traffic per the project scope. Year 2015 phase one traffic has not been analyzed.

B3. Off-Site Development Description

All off-site developments identified by the City of Fitchburg to the Madison Area Metropolitan Planning Organization (MPO) were included in the Year 2025 and Year 2035 background traffic volumes (i.e. volumes without the MPN). These developments include, but are not limited to, GreenTech Village and the Northeast Neighborhood located to the north and northeast of the MPN, and further development along Research Park Drive and East Cheryl Parkway.

B4. Site Generated Traffic

The traffic volumes expected to be generated by the MPN are based on the type and density of the proposed land uses, and on trip rates as published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 7th Edition, 2003*. The total trips documented below include linked trips, or trips within or between areas of the MPN. The actual traffic volumes in and out of the MPN area, less linked trips and multi-modal trips, are expected to be approximately 25-percent less than documented below.

Phase One PLUS Phase Two Generated Traffic

With the completion of phase one and phase two, the MPN is anticipated to generate approximately 3,465 new trips during a typical weekday morning peak hour (2,530 in/935 out) and 3,555 new trips during a typical weekday evening peak hour (1,155 in/2,400 out). On a typical weekday (24 hour period), phase one and phase two are anticipated to generate approximately 31,040 new trips (15,520 in/15,520 out).

Phase One PLUS Phase Two PLUS Phase Three Generated Traffic

Under full build-out, the MPN is anticipated to generate approximately 4,245 new trips during a typical weekday morning peak hour (3,010 in/1,235 out) and 4,400 new trips during a typical weekday evening peak hour (1,500 in/2,900 out). On a typical weekday (24 hour period), the full build-out of the MPN is anticipated to generate approximately 38,980 new trips (19,490 in/19,490 out).

B5. Access to MPN

Several new access points and roadways are proposed throughout the MPN. The following roadways have been studied as part of this TIA. Reference Exhibit 1-2 which illustrates the primary study area roadway network and intersections.

- Nobel Drive, which currently terminates east of Research Park Drive, is planned to continue east to Syene Road, then north-northeast to Lacy Road.
- Research Park Drive, which currently terminates south of Nobel Drive, is planned to continue south and eventually intersect with a future east-west road along a utility line at the south MPN boundary ("Monks Road").
- Mica Road, which currently terminates south of Lacy Road, is planned to continue south beyond Nobel Drive and eventually intersect with "Monks Road".

- Fahey Glen, which currently terminates south of Lacy Road, is planned to continue south to Nobel Drive. A roadway on the south side of Nobel Drive ("Mixed Use Road") will align with Fahey Glen and continue west to intersect with Research Park Drive. Though not planned as part of the MPN, the City is considering extending Fahey Glen north of Lacy Road to East Cheryl Parkway as part of the Phase One plan.
- Notre Dame Drive, which currently terminates south of Lacy Road, is planned to continue south beyond Nobel Drive and eventually intersect with "Monks Road". Though not planned as part of the MPN, the City is considering extending Notre Dame Drive north of Lacy Road to East Cheryl Parkway.
- Jones Farm Drive, which currently intersects Lacy Road as a tee-intersection from the north, is planned to extend from Lacy Road south-southeast to the existing dead-end of Tarpleywick Drive, which services land use area 18.
- "Parks Road" is planned to be an east-west road along the east-west border of land use areas 22 and 24. The road is planned to intersect Notre Dame Drive from the west, then, approximately 850-feet east of Notre Dame Drive become a north-south two-lane undivided local road that continues south across Nobel Drive and terminates at "Monks Road". The potential exists to connect "Parks Road" from "Monks Road" to Irish Lane in the future, though such a connection was not assumed to occur as part of this study.
- "Muriel Lane" is planned to be a north-south undivided road connecting Nobel Drive to "Monks Road" southwest of the Syene Road intersection with Nobel Drive. "Muriel Lane" will pass along and service residential land use. The potential exists to connect "Muriel Lane" from "Monks Road" to Irish Lane in the future, though such a connection was not assumed to occur as part of this study.
- "Monks Road" is planned to run east-west along the MPN south boundary and north of existing overhead utilities. The road will connect from the Research Park Drive extension to "Muriel Lane."

The City of Fitchburg has recently completed a bicycle and pedestrian plan that includes several improvements for the study area. Maps taken from the bicycle and pedestrian plan are included in Appendix A.

Additional pedestrian and bicycle facilities are recommended throughout the MPN as a means to reduce motorized vehicle traffic, provide alternative means of transportation, and provide for recreation. More specifically, sidewalks are recommended along all roadways in the plan area, multi-use trails traverse on and off-road in the plan, and on-street bicycle lanes are recommended in select areas. See Exhibit 1-3 for a diagram of proposed roadway cross-sections. See Exhibit 1-4 for a diagram of potential multi-use trails.

Madison Metro operates on-street bus routes 44 and 48 between the Fish Hatchery Road intersection with Nobel Drive in Fitchburg, through the South Transfer Station of Madison, and north through the University of Wisconsin-Madison campus. In combination there are 5 departures/4 arrivals during the weekday morning hours and 4 departures/5 arrivals during the weekday evening hours. This equates to 9 complete trips during weekdays and no trips during weekends. Strong consideration is being given to expanding transit service in the area. See Exhibit 1-5 for the paths of existing routes 44 and 48 and potential future bus routing. A dormant rail corridor along the east side of Syene Road is also being considered for future light rail transit or bus rapid transit. The MPN specifically focuses transit oriented land uses along this rail corridor.

PART C – RECOMMENDED IMPROVEMENTS

C1. Year 2008 Existing Traffic Recommended Improvements

The study area intersections were analyzed based on the procedures set forth in the *2000 Highway Capacity Manual* (HCM). Intersection operation is defined by "level of service". Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. LOS E represents the capacity of an intersection movement. For the purpose of this study, LOS D was used to define desirable peak hour operating conditions.

Year 2008 existing traffic volumes do not include any MPN development. The Year 2008 analysis was conducted using intersection geometrics and traffic signal sequencing anticipated upon completion of the Fish Hatchery Road improvements in the Year 2009. The following improvements, shown in Exhibit 1-6, are recommended to accommodate Year 2008 existing traffic.

Fish Hatchery Road & East Cheryl Parkway

- Extend the Fish Hatchery Road southbound left-turn lane.

Lacy Road & Syene Road

- Provide a Syene Road southbound channelized right-turn lane.

C2. Year 2025 Background Traffic Recommended Improvements

Year 2025 background traffic volumes assume growth within the study area, but do not include any MPN development. The Year 2025 background traffic analysis was conducted using intersection geometrics and traffic signal sequencing anticipated upon the completion of planned projects in the Year 2012, which include improvements to Fish Hatchery Road, improvements to Lacy Road, and construction of Interchange Road and the USH 14 interchange.

The following improvements, shown in Exhibit 1-7, are recommended to accommodate Year 2025 background traffic and are in addition to already planned improvements.

General Improvements

- Interchange Road is being planned as a four-lane roadway north of East Cheryl Parkway to CTH MM. Initially the roadway will be constructed as a two-lane facility east of USH 14. To accommodate Year 2025 background traffic, Interchange Road should be continued as a four-lane facility east of USH 14.
- East Cheryl Parkway should be widened to a four-lane roadway east of Fish Hatchery Road to east of Research Park Drive. The roadway should also be constructed/widened to a four-lane facility from Interchange Road to west of Syene Road. Note that Madison Area MPO daily traffic forecasts indicate that the stretch of roadway between these two widened areas will operate at the threshold between widening from a two-lane to four-lane roadway. That is, this section of roadway may operate as a two-lane roadway but may also require widening to four-lanes with or without the MPN.
- Widen Fish Hatchery Road to a four-lane divided highway south through Irish Lane.
- Coordinate traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Fish Hatchery Road & East Cheryl Parkway

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section east of Fish Hatchery Road to east of Research Park Drive.
- Provide dual left-turn lanes and an exclusive right-turn lane on the Fish Hatchery Road southbound approach.
- Provide a right-turn lane on the Fish Hatchery Road northbound approach.
- Provide a left-turn lane on the Cheryl Drive eastbound approach.
- Provide a left-turn lane on the East Cheryl Parkway westbound approach. Extend the existing westbound right-turn lane to a continuous lane, which will serve as a lane drop of the upstream outside through lane.
- Modify the traffic signals to include northbound/southbound protected-only left-turn signal heads and westbound to northbound permitted-overlap right-turn signal heads.

East Cheryl Parkway & Research Park Drive

- Construct the intersection with a two-lane modern roundabout, including two lane entries eastbound and westbound on East Cheryl Parkway, and one-lane entries northbound and southbound on Research Park Drive.

East Cheryl Parkway & Fahey Glen

- Recall that the City of Fitchburg plans to connect Fahey Glen from Lacy Road to an existing roundabout footprint located along East Cheryl Parkway at an unspecified future date. When this connection occurs, geometric modifications to the intersection design may be necessary so that the roundabout operates safely and efficiently as a modern roundabout.

East Cheryl Parkway & Syene Road

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section west of Interchange Road to west of Syene Road.
- Reconstruct the intersection with a two-lane modern roundabout, including two-lane entries eastbound and westbound on East Cheryl Parkway and one-lane entries northbound and southbound on Syene Road.

Interchange Road & East Cheryl Parkway

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section west of Interchange Road to west of Syene Road.
- It was assumed that, when constructed, the intersection will operate as a two-lane modern roundabout, including a two lane entry eastbound on East Cheryl Parkway, a one-lane entry plus right-turn bypass lane southbound on Interchange Road, and a one-lane entry northbound on Interchange Road.

Interchange Road & USH 14 Ramps

- Provide an additional left-turn lane (i.e. dual left-turn lanes) and extend the planned dual right-turn lanes on the USH 14 southbound off-ramp.

- Provide an additional eastbound through lane on Interchange Road over USH 14 and east through the USH 14 northbound ramps to receive traffic from the recommended southbound dual left-turn lanes.
- Extend the right-turn lane on the Interchange Road eastbound approach to the USH 14 southbound ramps.
- Extend the right-turn lane on the Interchange Road westbound approach to the USH 14 northbound ramps.
- Ensure traffic signal plans include westbound protected-permitted left-turn signal heads at the USH 14 southbound ramps and eastbound protected-only left-turn signal heads at the USH 14 northbound ramps.

Fish Hatchery Road & Lacy Road

- Provide an exclusive right-turn lane on the Fish Hatchery Road southbound approach.
- Extend the Fish Hatchery Road northbound left-turn lane.
- Extend the Lacy Road eastbound left-turn lane.
- Provide an exclusive right-turn lane on the Lacy Road westbound approach.
- Modify the traffic signals to include northbound protected-permitted left-turn signal heads.

Lacy Road & Research Park Drive

- Install stop signs on all approaches to the intersection, resulting in all-way stop control.

Lacy Road & Mica Road

- The City plans to design Lacy Road from city hall to Fahey Glen in the Year 2011 to include left-turn lanes at Mica Road. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Fahey Glen

- The City plans to design a one-lane modern roundabout at this intersection in the Year 2011. Further, recall that the City plans to connect Fahey Glen from Lacy Road to East Cheryl Parkway at a future date. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Notre Dame Drive

- Recall that the City of Fitchburg plans to connect Notre Dame Drive from Lacy Road to East Cheryl Parkway at a future date. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Syene Road

- Install traffic signals at the intersection.
- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road southbound approach.

- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road northbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Lacy Road westbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Lacy Road eastbound approach.
- Provide railroad preemption if the dormant rail corridor that lays immediately east of the intersection becomes active.

Lacy Road & Interchange Road

- Tee Interchange Road into Lacy Road from the north.
- Provide a left-turn lane on the Lacy Road eastbound approach.
- Provide a left-turn lane and a right-turn lane on the Interchange Road southbound approach.
- Install a stop sign to control the Interchange Road approach to Lacy Road.
- Note that if the east leg of Lacy Road would tee into west leg of Lacy Road and Interchange Road (i.e. if the west leg of Lacy Road would align with Interchange Road as a curve), the westbound left-turn volume would be such that intersection delay would increase, a wider cross-section would be necessary on Interchange Road, and in turn a wider crossing of the wetland north of the intersection could be necessary.

Fish Hatchery Road & Irish Lane

- As previously mentioned, widen Fish Hatchery Road to a four-lane cross-section south through Irish Lane.
- Provide a median of sufficient width to accommodate two-stage left-turn maneuvers from the Irish Lane approach (desirable width of 25-feet or greater).
- Extend the Fish Hatchery Road southbound left-turn lane.

Irish Lane & Syene Road

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

C3. Year 2035 Background Traffic Recommended Improvements

Year 2035 background traffic volumes assume growth within the study area, but do not include any MPN development. The following improvements, shown in Exhibit 1-8, are recommended to accommodate Year 2035 background traffic and are in addition to the Year 2025 background traffic recommended improvements (Exhibit 1-7).

Lacy Road & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

Lacy Road & Syene Road

- Install eastbound and westbound protected-permitted left-turn traffic signal heads.

Lacy Road & Interchange Road

- Provide a median of sufficient width to accommodate two-stage left-turn maneuvers from the Interchange Road approach (desirable width of 25-feet or greater).

Fish Hatchery Road & Nobel Drive

- Note that the eastbound left-turn and through movements may operate at LOS E/F conditions during the weekday peak hours. Volumes are not high enough to consider traffic signals. *No additional improvements are recommended at this intersection under Year 2035 background traffic volumes.*

C4. Year 2025 Build Traffic Recommended Improvements

Year 2025 build traffic volumes include Year 2025 background traffic plus traffic generated by phase one plus phase two of the MPN. The following improvements, shown in Exhibit 1-9, are recommended to accommodate Year 2025 build traffic and are in addition to the Year 2025 background traffic recommended improvements (Exhibit 1-7).

General Improvements

- Improve Lacy Road east of Fahey Glen to a similar cross-section to that which exists in front of city hall, with center left-turn lanes at Notre Dame Drive and Jones Farm Drive.

Interchange Road & East Cheryl Parkway

- Modify the roundabout to include two northbound and two southbound entries. Taper the resulting two southbound receiving lanes to one lane prior to crossing the wetland that exists north of Lacy Road.

Fish Hatchery Road & Lacy Road

- Extend the Fish Hatchery Road southbound left-turn lane.
- Extend the Fish Hatchery Road northbound left-turn lane.
- Provide an exclusive right-turn lane on the Lacy Road eastbound approach.

Lacy Road & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

Lacy Road & Notre Dame Drive

- Provide a left-turn lane on the westbound Lacy Road approach.
- Provide a left-turn lane on the eastbound Lacy Road approach.

Lacy Road & Jones Farm Drive

- Provide a left-turn lane on the westbound Lacy Road approach.
- Provide a left-turn lane on the eastbound Lacy Road approach.

Lacy Road & Interchange Road/Nobel Drive

- Construct Nobel Drive to align with Interchange Road.

- Construct a one-lane modern roundabout with one-lane entries on the northbound, westbound and eastbound approaches, and a two-lane entry on the southbound approach.

Fish Hatchery Road & Nobel Drive

- Install traffic signals at the intersection, including southbound protected-permitted left-turn signal heads.
- Extend the Fish Hatchery Road southbound left-turn lane.
- Extend the Fish Hatchery Road northbound right-turn lane.
- Extend the Nobel Drive westbound right-turn lane.
- Coordinate the traffic signal with other traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Nobel Drive & Mica Road

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Mica Road approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through lane and an exclusive right-turn lane on the Mica Road southbound approach.
- Provide a shared left-turn/through lane and an exclusive right-turn lane on the Mica Road northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Fahey Glen/"Mixed Use" Road

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Fahey Glen approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through/right-turn lane on the Fahey Glen southbound approach.
- Provide a shared left-turn/through/right-turn lane on the "Mixed Use Road" northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Notre Dame Drive

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Notre Dame Drive approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through/right-turn lane on the Notre Dame Drive southbound approach.
- Provide a shared left-turn/through/right-turn lane on the Notre Dame Drive northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Syene Road

- Install traffic signals at the intersection, including westbound protected-permitted left-turn signal heads.
- Provide a left-turn lane and a shared through/right-turn lane on the Syene Road southbound approach.
- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road northbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide a left-turn lane, a through lane and a right-turn lane on the Nobel Drive eastbound approach.
- Provide railroad preemption if the dormant rail corridor that lays immediately east of the intersection becomes active.

C5. Year 2035 Build Traffic Recommended Improvements

Year 2035 build traffic volumes include Year 2035 background traffic plus traffic generated by the full build-out of the MPN. The following improvements, shown in Exhibit 1-10, are recommended to accommodate Year 2025 build traffic and are in addition to the Year 2025 build traffic recommended improvements (Exhibit 1-8).

General Improvements

- Reserve right-of-way within the MPN boundaries along Syene Road, south of Nobel Drive, to accommodate a potential future four-lane facility.
- Widen Lacy Road to a four-lane facility west of Research Park Drive to west of Fish Hatchery Road.

East Cheryl Parkway & Syene Road

- Provide a flared right-turn on the Syene Road southbound approach.

Interchange Road & USH 14 Ramps

- Modify the traffic signal sequence of operations at the USH 14 southbound ramps to include a southbound right-turn only phase that will operate with the southbound left-turn phase as well as independently prior to the westbound through phase.
- Extend the Interchange Road eastbound pre-left-turn lane.

Fish Hatchery Road & Lacy Road

- As previously mentioned, widen Lacy Road to a four-lane facility west of Research Park Drive to west of Fish Hatchery Road.
- Provide an additional westbound through lane on Lacy Road through Fish Hatchery Road, then taper back to one lane west of the intersection.
- Provide an additional eastbound through lane on Lacy Road. An exclusive eastbound right-turn lane is no longer necessary

Lacy Road & Research Park Drive

- Modify the roundabout to accommodate an eastbound right-turn lane in the roundabout. The right-turn lane will serve as a lane drop of the upstream outside through lane.

Lacy Road & Jones Farm Drive

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Jones Farm Drive approaches (minimum width of 22-feet).

Lacy Road & Syene Road

- Install eastbound protected-permitted left-turn signal heads.

Lacy Road & Interchange Road/Nobel Drive

- Widen the roundabout to accommodate two entry lanes on the Lacy Road eastbound approach.

Fish Hatchery Road & Nobel Drive

- Extend the Nobel Drive westbound right-turn lane.

Nobel Drive & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one lane entries on each approach.

Nobel Drive & Mica Road

- Install stop signs to control the eastbound and westbound approaches, resulting in all-way stop control. A one-lane modern roundabout with one-lane entries on each approach can also be considered as an alternative.

Fish Hatchery Road & Irish Lane

- Install traffic signals at the intersection.

- Coordinate the traffic signal with other traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Irish Lane & Syene Road

- Reconstruct the roundabout to accommodate flared entries (i.e. two-lane entries) northbound and southbound on Syene Road. Taper the two-lanes back to one-lane in each direction downstream of the roundabout.

C6. Other Considerations

Syene Road intersection with Nobel Drive

As a guideline, all roadways within the MPNP should intersect between 75 and 105 degrees of each other – the closer to perpendicular the better. Further, the curb-to-curb area of the roadways should be located outside the drip lines of identified heritage trees and potential tree specimens, or a distance of approximately 30-feet. Meeting these constraints poses an issue for the Syene Road intersection with Nobel Drive.

Due to the proximity of an existing neighborhood to the northwest of the intersection, environmentally sensitive areas to the west and south of the intersection, and wetland corridors and tree specimens east of the intersection, the 100-foot ROW of Nobel Drive (66-feet curb to curb) cannot intersect Syene Road at an angle between 75 and 100 degrees.

With superelevation, which is recommended for its ability to reduce curve radii and thus reduce intersection skew, the closest intersection angle to perpendicular at the Nobel Drive crossing of Syene Road is 65 degrees. The corner of a residential lot in the northwest corner of the intersection may be clipped by the road making it necessary for a land purchase to accommodate the 100-foot ROW. Nobel Drive will also pass through the 300-foot environmental corridor, but not the 75-foot corridor, of a wetland on the east side of Syene Road.

While a skew is not ideal, the recommended placement of a traffic signal at this location in the future minimizes safety concerns typically found at skewed intersections. According to the American Association of State Highway and Transportation Officials' *Geometric Design of Highways and Streets 2004 (GDHS),* "an angle of at least 60 degrees provides most of the benefits of a 90-degree intersection while reducing right-of-way takings and construction costs often associated with providing a right-angle intersection." (GDHS, 581)

Syene Road intersection with Wildheather Drive

Wildheather Drive is an existing residential street that intersects Syene Road approximately 350-feet north of the proposed Syene Road intersection with Nobel Drive. Every effort should be made to maintain full access at the intersection in the future. Future access to the neighborhood can be made via Jones Farm Drive, or via a connection to Syene Road from the western TOD area.

Construction Phasing

The costs associated with providing infrastructure prior to development may make constructing the entire extent of Nobel Drive at one time unfeasible. Construction will most likely need to be performed as development occurs. The initial phasing of the MPN includes development west of Fahey Glen and east of Syene Road. To accommodate this phasing:

- It is recommended to construct Nobel Drive to Fahey Glen and Fahey Glen to Nobel Drive as part of the initial development of the western portion of the plan. This construction will provide development on the western portion of the MPN at least two

points of access to the existing roadway system, which is desirable for emergency operations. The MPN Steering Committee further recommends that Fahey Glen be extended north to East Cheryl Parkway under phase one as well, to draw traffic away from Mica Road and Lacy Road.

- It is recommended to construct Nobel Drive between Syene Road and Lacy Road as part of the initial development of the eastern portion of the plan. Blaney Road should be removed when this construction occurs. Note that the existing processing facility (Hartung property) east of Syene Road at the proposed Nobel Drive crossing may not be relocated in time. If this relocation is not performed in time, it is recommended to construct a secondary access to Lacy Road approximately half the distance between the proposed Nobel Drive intersection and USH 14.
- Construction of the remaining extent of Nobel Drive, from Fahey Glen to Syene Road, can be phased in over time as development plans come to fruition in the middle of the Neighborhood.

PART D – CONCLUSION

All movements at the study area intersections are expected to operate safely and efficiently with the recommended improvements.

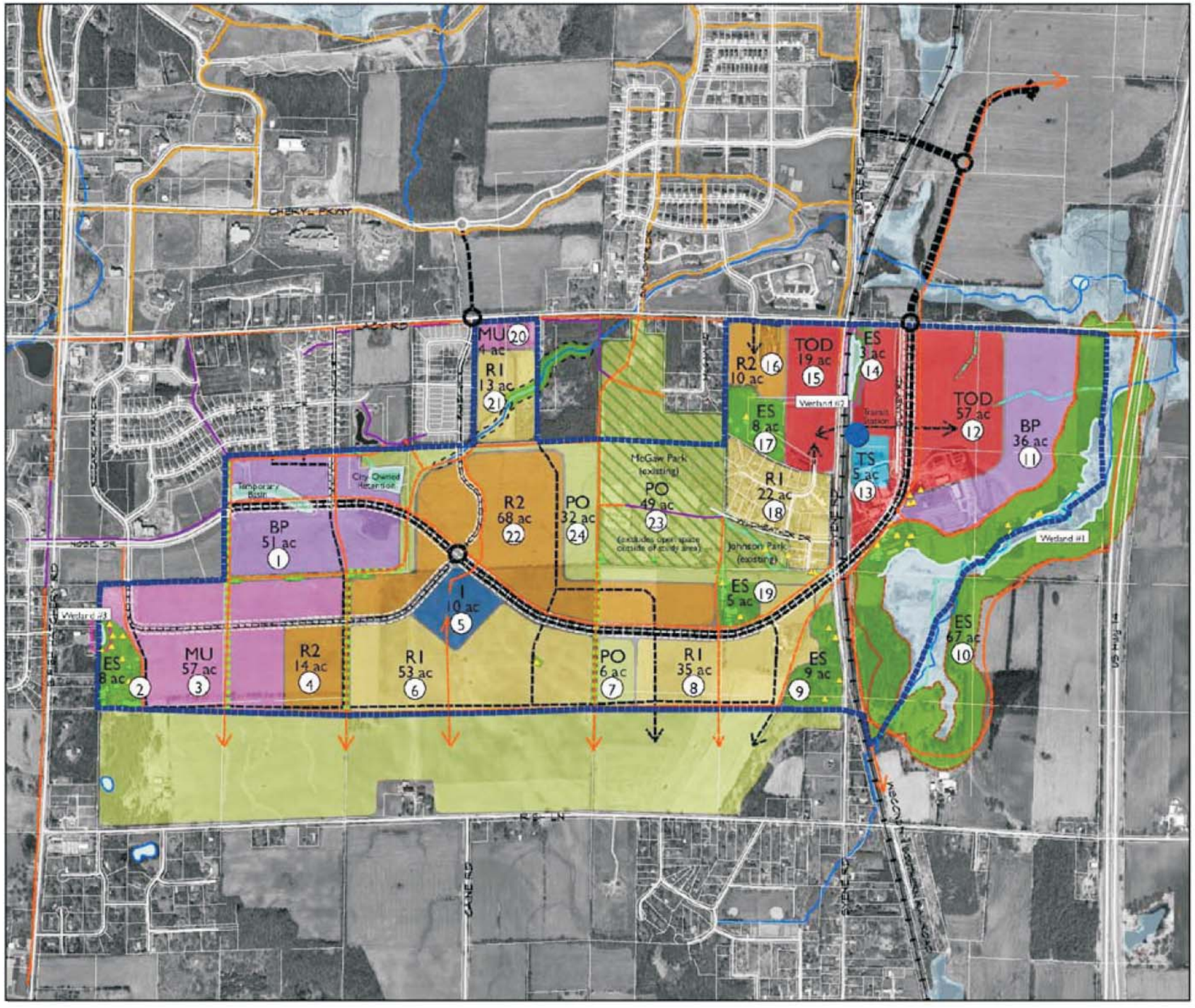
It is important to note that this TIA analyzes traffic estimates sixteen to twenty-six years into the future and has been done as a planning study rather than for specifically-known development end users. The years shown are approximate for the purpose of the traffic analysis. The further into the future a forecast is carried the greater the opportunity for error. Implementation of the land use plan may also result in end users with greater or lesser trip intensities than those reflected by ITE trip rates and this TIA. Caution should be taken to implement phased improvements in a manner that minimizes impacts to the motoring public and the surrounding environment, but that does not result in a system that is overbuilt. On that same note, caution should be given to preserving and dedicating right-of-way for future improvements should they be needed as outlined in this study. It is recommended to perform updated traffic impact analyses as development occurs to validate the findings of this TIA.

McGAW PARK
Neighborhood Plan

City of Fitchburg, WI

Growth Model

DRAFT



LEGEND

- Study Area Boundary
- TS — Transit Station
- R2 — Residential (minimum average density of 10 du/ac)
- R1 — Residential (minimum average density of 5 du/ac)
- MU — Mixed Use (Office/Residential)
- TOD — Transit Oriented Development
- PO — Parks & Open Space
- Existing Parks
- ES — Environmentally Sensitive Areas
- BP — Business Park
- I — Institutional
- Proposed Roads
- Existing Path (RPC)
- Existing Path
- Proposed Path
- Greenway/Pedestrian Trail
- Heritage Trees
- Specimen *
- Wetlands
- Wetland Buffer (75 ft)
- Wetland Buffer (300 ft)
- Creek/Waterway
- Drainageway
- Non-Navigable Drainageway

Last Revised: February 3, 2009

GIS map files provided by City of Fitchburg & Capital Area RPC
Maps prepared by TAI | MARS | NRC | TAD

0 — 750 — 1,500 — 3,000 Feet

THIS IS THE DRAFT GROWTH MODEL. *See Exhibits 1-2 through 1-5 for more accurate locations of roadways, intersections, trails, and potential transit routes.*

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-1
MPN GROWTH MODEL
FITCHBURG, WISCONSIN

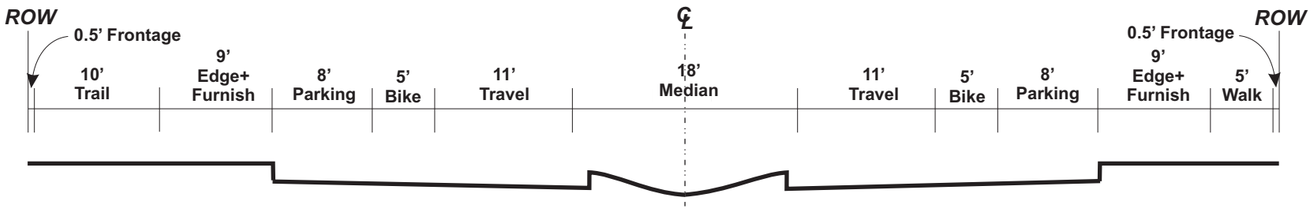
NORTH
NOT TO SCALE

EAST CHERYL PKWY
EAST CHERYL PKWY
LACY RD
LACY RD
FISH HATCHERY RD
MICA RD
FAHEY GLEN
NOTRE DAME
JONES FARM
SYENE RD
INTERCHANGE RD
NOBEL DR
NOBEL DR
"MIXED USE" RD
"MONKS" RD
"PARKS"
"MURIEL"
IRISH LANE
SYENE RD
RAILROAD R.O.W.
EAST HILL
USH 14

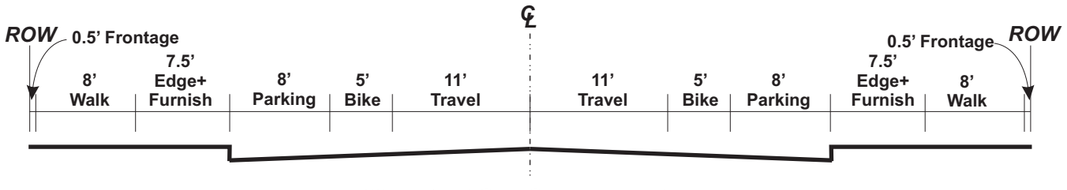
TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

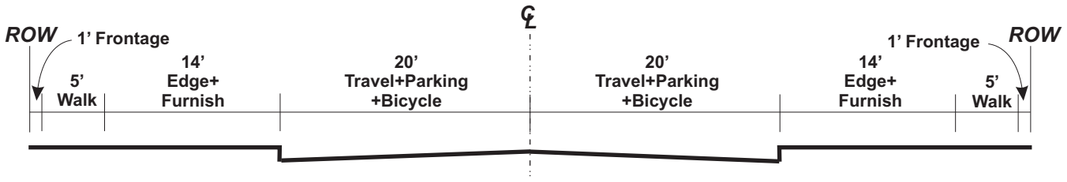
EXHIBIT 1-2
MPN STUDY AREA ROADWAYS & INTERSECTIONS
FITCHBURG, WISCONSIN



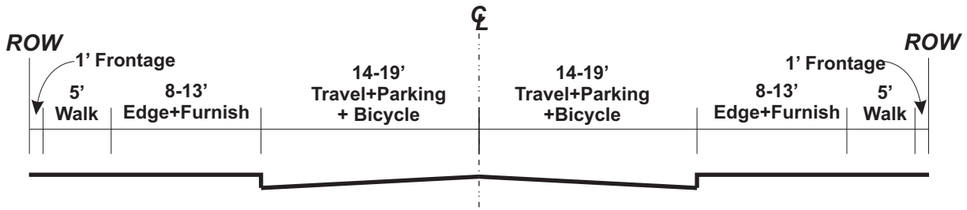
100' WIDE RIGHT-OF-WAY
Nobel Drive Extended



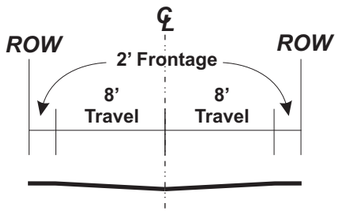
80' WIDE RIGHT-OF-WAY - TYPE A
Research Park Drive Extended to "Mixed Use Road", "Mixed Use Road", & Primary TOD Roadways



80' WIDE RIGHT-OF-WAY - TYPE B
Fahey Glen Extended



66' WIDE RIGHT-OF-WAY
Other roadways within the McGaw Park Neighborhood Plan; Reduced ROW may be considered on a case by case basis on local residential streets as development occurs



20' WIDE RIGHT-OF-WAY
Alleys

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-3
PROPOSED ROADWAY CROSS-SECTIONS
FITCHBURG, WISCONSIN

NORTH
NOT TO SCALE

EAST CHERYL PKWY
EAST CHERYL PKWY
JONES FARM
SYENE RD
INTERCHANGE RD
LACY RD
LACY RD
FISH HATCHERY RD
MICA RD
FAHEY GLEN
NOBEL DR
NOTRE DAME
NOBEL DR
"MIXED USE" RD
"PARKS"
"MURIEL"
USH 14
"MONKS" RD
SYENE RD
RAILROAD R.O.W.
IRISH LANE

EXISTING OR RPC PROPOSED MULTI-USE TRAIL
MPNP PROPOSED MULTI-USE TRAIL

TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09

EXHIBIT 1-4
PROPOSED MULTI-USE TRAILS
FITCHBURG, WISCONSIN

NORTH
NOT TO SCALE

EAST CHERYL PKWY
EAST CHERYL PKWY
JONES FARM
SYENE RD
INTERCHANGE RD
LACY RD
LACY RD
FISH HATCHERY RD
MICA RD
FAHEY GLEN
NOBEL DR
NOTRE DAME
NOBEL DR
"MIXED USE" RD
"PARKS"
"MURIEL"
USH 14
"MONKS" RD
SYENE RD
RAILROAD R.O.W.
IRISH LANE

EXISTING TRANSIT ROUTES 44 & 48
POTENTIAL TRANSIT ROUTE A1
POTENTIAL TRANSIT ROUTE A2

TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09

EXHIBIT 1-5
POTENTIAL TRANSIT IMPROVEMENTS
FITCHBURG, WISCONSIN

(IN ADDITION TO CITY PLANS TO IMPROVE FISH HATCHERY ROAD)

LEGEND:

- TRAFFIC SIGNAL
- ® ROUNDABOUT
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
EAST CHERYL PARKWAY
JONES FARM DRIVE
CHERYL DRIVE
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE

200' (+70')
50' (NC)
(N/C) 110'
150' (NC)
155' (NC)
50' (NC)
(NC) 130'
(N/C) 100'
(NC) 175'
(NC) CONT
(NC) 125'
(NC) 125'
200' (NC)
(NC) 175'
125' (NC)
150'
100' (NC)
150' (NC)
150' (NC)
100' (NC)
(NC) CONT
(NC) 150'
(N/C) 100'
(NC) 100'
100' (NC)
50' (NC)
(NC) 150'

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-6
YEAR 2008 EXISTING TRAFFIC
RECOMMENDED IMPROVEMENTS
FITCHBURG, WISCONSIN

(IN ADDITION TO IMPROVEMENT PLANS ANTICIPATED PRIOR TO YEAR 2025)

LEGEND:

- TRAFFIC SIGNAL
- ROUNDABOUT
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
EAST CHERYL PARKWAY
JONES FARM DRIVE
INTERCHANGE ROAD
CHERYL DRIVE
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE

200' 350' CONT 200' 150' (N/C) 110' 200'
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(+170') 300' (+50') 150' (NC) 175' (NC) CONT 200' 150' 150' (NC) 150'
350' (+100') 225' 225' (+75') 225' (NC) (NC) 250' PRE-LEFT (NC)CONT (+75') 200' (NC) 150'
100' (NC) 150' (NC) 150' (NC) 100' (NC) (NC) 100' (NC) CONT (NC) 150' (N/C) 100'
200' (+100') 50' (NC) (NC) 150'

EXHIBIT DATE: 05-08-09

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT 1-7
YEAR 2025 BACKGROUND TRAFFIC
RECOMMENDED IMPROVEMENTS
FITCHBURG, WISCONSIN

(IN ADDITION TO YEAR 2025 BACKGROUND RECOMMENDED IMPROVEMENTS, EXHIBIT 1-7)

LEGEND:

- TRAFFIC SIGNAL
- ROUNDABOUT
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)

RESEARCH PARK DRIVE

SYENE ROAD

USH 14 SB RAMPS

USH 14 NB RAMPS

EAST CHERYL PARKWAY

JONES FARM DRIVE

INTERCHANGE ROAD

CHERYL DRIVE

LACY ROAD

MICA ROAD

FAHEY GLEN

NOTRE DAME

NOBEL DRIVE

IRISH LANE

EAST HILL DRIVE

200' (NC)
350' (NC)
CONT (NC)
200' (NC)
(NC) 150'
(N/C) 110'
(NC) 200'
200' (NC)
150' (NC)
200' (NC)
155' (NC)
(NC) 300'
(NC) 150'
(NC) 175'
125' (NC)
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125' (NC)
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150' (NC)
200' (NC)
(NC) 200'
75' (NC)
(NC) 150'
(NC) 150'
(NC) 150'
350' (NC)
225' (NC)
225' (NC)
225' (NC)
(NC) 250' PRE-LEFT
(NC)CONT
(NC) 200'
(NC) 150'
100' (NC)
150' (NC)
150' (NC)
100' (NC)
(NC) CONT
(NC) 150'
(N/C) 100'
(NC) 100'
200' (NC)
50' (NC)
(NC) 150'

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-8
YEAR 2035 BACKGROUND TRAFFIC
RECOMMENDED IMPROVEMENTS
FITCHBURG, WISCONSIN

(IN ADDITION TO YEAR 2025 BACKGROUND RECOMMENDED IMPROVEMENTS, EXHIBIT 1-7)

LEGEND:

- TRAFFIC SIGNAL
- ROUNDABOUT
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
EAST CHERYL PARKWAY
JONES FARM DRIVE
INTERCHANGE ROAD
CHERYL DRIVE
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
"MIXED USE ROAD"
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE

200' (NC)
350' (NC)
CONT (NC)
200' (NC)
(NC) 150'
(N/C) 110'
(NC) 200'
200' (NC)
200' (+50')
200' (NC)
155' (NC)
(NC) 300'
150'
(+50') 200'
(NC) 175'
(NC) 125'
125' (NC)
125'
125'
(NC) 125'
125' (NC)
125'
125' (NC)
150' (NC)
150' (NC)
200' (NC)
(NC) 200'
FLARE
(NC) 150'
(NC) 150'
350' (NC)
225' (NC)
225' (NC)
225' (NC)
(NC) 250' PRE-LEFT
(NC)CONT
(NC) 200'
(NC) 150'
100' (NC)
500' (+350')
200' (+50')
100' (NC)
(NC) 100'
(NC) CONT
(NC) 150'
(+100') 200'
75'
125'
125'
75'
125'
125'
125'
125'
125'
150'
300'
150'
150'
150'
200'
200' (NC)
50' (NC)
(NC) 150'

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-9
YEAR 2025 BUILD TRAFFIC
RECOMMENDED IMPROVEMENTS
FITCHBURG, WISCONSIN

(IN ADDITION TO YEAR 2025 BUILD RECOMMENDED IMPROVEMENTS, EXHIBIT 1-9)

LEGEND:

- TRAFFIC SIGNAL
- Ⓡ ROUNDABOUT
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
EAST CHERYL PARKWAY
JONES FARM DRIVE
INTERCHANGE ROAD
CHERYL DRIVE
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
"MIXED USE ROAD"
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE

200' (NC) 350' (NC) CONT (NC) 200' (NC)
(NC) 150' (N/C) 110' (NC) 200'
200' (NC) 200' (NC) 200' (NC) 155' (NC)
(NC) 300' (NC) 200' (NC) 175'
CONT 125' (NC) (NC) 125' (NC) 125' (NC)
(NC) 125' (NC) 125' (NC) 125' (NC) 125' (NC)
(NC) 125' (NC) 125' (NC) 150' (NC) 150' (NC)
(NC) 200' 200' (NC) FLARE (NC) FLARE
(NC) 150' (NC) 150' FLARE
350' (NC) 225' (NC) 225' (NC)
(+100') 350' PRE-LEFT (NC)CONT
(NC) 200' (NC) 150'
100' (NC) 500' (NC) 300' (+100')
(NC) CONT (NC) 150' (NC) 200'
75' (NC) 125' (NC) (NC) 125' (NC) 75'
(NC) 125' 125' (NC) (NC) 125' 125' (NC)
150' (NC) 300' (NC) (NC) 150' (N/C) 200'
(NC) 150' (NC) 150'
200' (NC) 125' (+75') FLARE FLARE
(NC) 150'

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 1-10
YEAR 2035 BUILD TRAFFIC RECOMMENDED IMPROVEMENTS
FITCHBURG, WISCONSIN

CHAPTER II – PROPOSED DEVELOPMENT

PART A – ON-SITE DEVELOPMENT

A1. Development Description and Site Location

The McGaw Park Neighborhood (MPN) comprises the majority of land west of United States Highway (USH) 14, east of Fish Hatchery Road, south of Lacy Road and north of Irish Lane. A site location map illustrating the MPN study area roadways and intersections is shown in Exhibit 2-1. A copy of the MPN growth model is shown in Exhibit 2-2. A more detailed description of development is presented in *A2. Land Use and Intensity*.

A2. Land Use and Intensity

According to Teska Associates, Inc., the following development is anticipated within the MPN. The numbers listed match the area numbers shown in the MPN growth model (Exhibit 2-2). The *italicized* land uses are land uses which are assumed to generate negligible volumes of traffic to/from the MPN. Note that all figures are approximate based on long-term planning assumptions. Actual densities may change for individual areas based on market forces and future implementation.

1. Business Park, 51 acres (approx. 788,653.8 square feet (sf));
2. *Environmentally Sensitive Area, 8 acres;*
3. Mixed Use, 57 acres (approx. 440,718.3-sf of office and 202 multi-family units);
4. Residential with 5 to 10 du/acre, 14 acres (approx. 99 multi-family units);
5. Institutional, 10 acres (assumed elementary school with approx. 625 students);
6. Residential with below 5 du/acre, 53 acres (approx. 188 single-family units);
7. *Parks & Open Space, 6 acres;*
8. Residential with below 5 du/acre, 35 acres (approx. 124 single-family units);
9. *Environmentally Sensitive Area, 9 acres;*
10. *Environmentally Sensitive Area, 67 acres;*
11. Business Park, 36 acres (approx. 556,696.8 sf);
12. Transit Oriented Development, 57 acres (approx. 270,616.5 sf office, 69,587.1 sf retail, and 447 multi-family units);
13. Transit Station, 5 acres (approx. 128 parking spaces per acre on 3 of the available 5 acres);
14. *Environmentally Sensitive Area, 3 acres;*
15. Transit Oriented Development, 19 acres (approx. 90,205.5 sf office, 23,195.7 sf retail, and 149 multi-family units);
16. Residential with 5 to 10 du/acre, 10 acres (approx. 71 multi-family units);
17. *Environmentally Sensitive Area, 8 acres;*
18. Residential with below 5 du/acre, 22 acres (approx. 78 single-family units);
19. *Environmentally Sensitive Area, 5 acres;*

20. Mixed Use, 4 acres (approx. 30,927.6-sf of office and 15 multi-family units);
21. Residential with below 5 du/acre, 13 acres (approx. 47 single-family units);
22. Residential with 5 to 10 du/acre, 66 acres (approx. 469 multi-family units);
23. *Parks & Open Space, 49 acres;*
24. *Parks & Open Space, 32 acres.*

In total, including approximately 73 acres of land assumed for right-of-way, the MPN has a planned area of approximately 712 acres.

A3. Site Plan

Several new access points and roadways are proposed throughout the MPN. The following roadways have been studied as part of this TIA. Reference Exhibit 2-1 which illustrates the primary study area roadway network and intersections.

- Nobel Drive, which currently terminates east of Research Park Drive, is planned to continue east to Syene Road, then north-northeast to Lacy Road.
- Research Park Drive, which currently terminates south of Nobel Drive, is planned to continue south and eventually intersect with a future east-west road along a utility line at the south MPN boundary ("Monks Road").
- Mica Road, which currently terminates south of Lacy Road, is planned to continue south beyond Nobel Drive and eventually intersect with "Monks Road".
- Fahey Glen, which currently terminates south of Lacy Road, is planned to continue south to Nobel Drive. A roadway on the south side of Nobel Drive ("Mixed Use Road") will align with Fahey Glen and continue west to intersect with Research Park Drive. Though not planned as part of the MPN, the City is considering extending Fahey Glen north of Lacy Road to East Cheryl Parkway as part of the Phase One plan.
- Notre Dame Drive, which currently terminates south of Lacy Road, is planned to continue south beyond Nobel Drive and eventually intersect with "Monks Road". Though not planned as part of the MPN, the City is considering extending Notre Dame Drive north of Lacy Road to East Cheryl Parkway.
- Jones Farm Drive, which currently intersects Lacy Road as a tee-intersection from the north, is planned to extend from Lacy Road south-southeast to the existing dead-end of Tarpleywick Drive, which services land use area 18.
- "Parks Road" is planned to be an east-west road along the east-west border of land use areas 22 and 24. The road is planned to intersect Notre Dame Drive from the west, then, approximately 850-feet east of Notre Dame Drive become a north-south two-lane undivided local road that continues south across Nobel Drive and terminates at "Monks Road". The potential exists to connect "Parks Road" from "Monks Road" to Irish Lane in the future, though such a connection was not assumed to occur as part of this study.
- "Muriel Lane" is planned to be a north-south undivided road connecting Nobel Drive to "Monks Road" southwest of the Syene Road intersection with Nobel Drive. "Muriel Lane" will pass along and service residential land use. The potential exists to connect "Muriel Lane" from "Monks Road" to Irish Lane in the future, though such a connection was not assumed to occur as part of this study.

- "Monks Road" is planned to run east-west along the MPN south boundary and north of existing overhead utilities. The road will connect from the Research Park Drive extension to "Muriel Lane."

A4. Development Phasing and Timing

The MPN developable area has been divided into three phases:

- Phase One, assumed to be complete around Year 2015, is to include the following build-out: 40-percent of area 1 and 15; 30-percent of areas 11 and 12; 60-percent of area 16; 100-percent of areas 17, 18, 20 and 21; 15-percent of area 22; 80-percent of area 23; and 20-percent of area 24.
- Phase One PLUS Phase Two, assumed to be complete around Year 2025, is to include the following buildout: 100-percent of areas 1, 2, 5, 7, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 23; 80-percent of areas 3, 12 and 24; 30-percent of area 6; 40-percent of area 8; and 60-percent of areas 11 and 22.
- Phase One PLUS Phase Two PLUS Phase Three, assumed to be complete around Year 2035, is to include the full build-out of the entire MPN.

The years shown are approximate for the purpose of the traffic analysis. Year 2025 and Year 2035 traffic analyses have been included in this TIA along with an analysis of Year 2008 existing traffic per the project scope. Year 2015 phase one traffic has not been analyzed.

PART B – STUDY AREA

B1. Influence Area

The proposed development is expected to draw trips both locally and regionally. The areas of significant influence include the City of Fitchburg, City of Madison, City of Verona, Village of Oregon, and other surrounding cities, villages and towns in the Madison Urbanized Area.

B2. Area of Significant Traffic Impact

The following is an outline of the existing and proposed intersections included in this TIA. An asterisk (*) next to an existing intersection indicates that turning movement counts were not conducted at the intersection.

The following is an outline of the existing and proposed intersections included in this TIA. An asterisk (*) next to an existing intersection indicates that turning movement counts were not conducted at the intersection.

Existing Intersections for Study:

- Fish Hatchery Road & East Cheryl Parkway (traffic signal control)
- East Cheryl Parkway & Research Park Drive (two-way stop control)
- East Cheryl Parkway & Syene Road (two-way stop control) *
- Fish Hatchery Road & Lacy Road (traffic signal control)
- Lacy Road & Research Park Drive (two-way stop control)
- Lacy Road & Mica Road (two-way stop control)
- Lacy Road & Fahey Glen (two-way stop control)
- Lacy Road & Notre Dame Drive (two-way stop control) *

- Lacy Road & Jones Farm Drive (two-way stop control) *
- Lacy Road & Syene Road (two-way stop control)
- Fish Hatchery Road & Nobel Drive (two-way stop control)
- Nobel Drive & Research Park Drive (two-way stop control)
- Fish Hatchery Road & Irish Lane (two-way stop control)
- Irish Lane & East Hill Drive (two-way stop control)
- Irish Lane & Syene Road (two-way stop control).

Future Intersections for Study:

- East Cheryl Parkway & Fahey Glen (roundabout footprint exists)
- Interchange Road (a.k.a. New Lacy Road) & East Cheryl Parkway
- Interchange Road & USH 14 Southbound Ramps
- Interchange Road & USH 14 Northbound Ramps
- Lacy Road & Interchange Road/Nobel Drive
- Nobel Drive & Mica Road
- Nobel Drive & Fahey Glen
- Nobel Drive & Notre Dame Drive
- Nobel Drive & Syene Road.

The City of Fitchburg is planning to have several roadway projects undertaken within the study area regardless of the development of the MPN.

1. *Improvement of Fish Hatchery Road*. Fish Hatchery Road, also designated as County Trunk Highway (CTH) D, has a four lane divided cross-section north of Lacy Road, then tapers to a two-lane undivided facility south of Lacy Road. Fish Hatchery Road is planned for improvement to a two-lane divided cross-section to south of Nobel Drive in the Year 2009. A multi-use trail will be provided along the west side of the highway, and turn lanes will be added at the Fish Hatchery Road intersection with Irish Lane.
2. *Improvement of Lacy Road*. The City of Fitchburg plans to redesign Lacy Road from the City Community Center east to Fahey Glen in the Year 2011. Design has not yet begun, but the City indicates that the intent at this time is to design an improved two-lane cross-section similar to that which exists in front of City Hall with a center turn lane only at Mica Road. The intent is to construct a roundabout at the Lacy Road intersection with Fahey Glen.
3. *Construction of New USH 14 Interchange*: A new USH 14 interchange is being planned by the City of Fitchburg. The plan is to maintain the existing Syene Road intersection with Lacy Road. East of the intersection, the plan is to realign Lacy Road north to the new diamond interchange approximately 3,200-feet north of the existing Lacy Road overpass. This new roadway is referred to as both "New Lacy Road" and "Interchange Road." Due to spacing constraints, the plan is to eliminate the USH 14 northbound off-ramp and USH 14 southbound on-ramp at the existing McCoy Road interchange further north. Construction is anticipated in Year 2010.

The City of Fitchburg plans to connect Fahey Glen from Lacy Road to an existing roundabout footprint located along East Cheryl Parkway, as well as connect Notre Dame Drive from Lacy Road north to East Cheryl Parkway, at a future date.

PART C – OFF-SITE LAND USE AND DEVELOPMENT

All off-site developments identified by the City of Fitchburg to the Madison Area Metropolitan Planning Organization (MPO) were included in the Year 2025 and Year 2035 background traffic volumes (i.e. volumes without the MPN). These developments include, but are not limited to, GreenTech Village and the Northeast Neighborhood located to the north and northeast of the MPN, and further development along Research Park Drive and East Cheryl Parkway.

Exhibit 2-3 shows the City of Fitchburg Year 2007 existing land use map and the City's DRAFT future urban growth area neighborhoods under consideration.

PART D – SITE ACCESSIBILITY

D1. Study Area Roadways

USH 14 borders the MPN on the east is classified by the City of Fitchburg as a north-south primary arterial freeway connecting the City of Fitchburg to Madison (north), Oregon (south), and Janesville (southeast). The MPO functional classification is the same. The speed limit on the four-lane divided facility is 65 mph. USH 14 is expected to be a heavily utilized route for the MPN, especially for commuters to/from the City of Madison.

Fish Hatchery Road, also known as County Trunk Highway (CTH) D, borders the MPN on the west and is classified by the City of Fitchburg and the MPO as a north-south minor arterial facility connecting the City of Fitchburg to Madison. Fish Hatchery Road is posted at 40 mph from north of Lacy Road to north of Sparkle Stone Crescent, then transitions to a 50 mph speed limit to the south. It is a four-lane divided facility north of Lacy Road, will be improved in Year 2009 to a two-lane divided facility with a 40 mph speed limit from Lacy Road to south of Nobel Drive, and will remain a two-lane undivided facility to the south. While USH 14 is expected to be a commuter route to/from the City of Madison, Fish Hatchery Road is expected to be used primarily for local north-south trips in the City of Fitchburg.

Lacy Road borders the MPN on the north and is classified by the City of Fitchburg as a major collector connecting the City of Fitchburg to USH 14 on the east and indirectly to USH 18/151 and Verona to the west. Note that the MPO classifies the facility as a minor arterial. Lacy Road, posted at 35 mph from the west to Syene Road and 50-mph east of Syene Road, is a two-lane divided facility from Fish Hatchery Road to Research Park Drive, transitions to a two-lane facility with center turn lanes in front of Fitchburg City Hall, then transitions to a two-lane undivided facility to the east. Design has not yet begun, but the City of Fitchburg indicates that the intent at this time is to design an improved two-lane cross-section similar to that which exists in front of City Hall, but with a center turn lane only at Mica Road, east to Fahey Glen in the Year 2011. The intent is to construct a roundabout at the Lacy Road intersection with Fahey Glen.

Irish Lane exists approximately one-quarter mile south and about parallel to the MPN south border. The road, which is located south of the existing Fitchburg urban growth boundary, is classified by the City of Fitchburg as an east-west minor collector facility connecting Fish Hatchery Road on the west to CTH MM on the east. The MPO classifies Irish Lane as a collector facility, but only between Fish Hatchery Road and Syene Road. The speed limit on the two-lane undivided facility is 45 mph in the vicinity of Fish Hatchery Road and 35-mph in the vicinity of Syene Road. No direct connections are planned between the MPN and Irish Lane

and, therefore, Irish Lane is not anticipated to be a heavily utilized route to/from the Neighborhood. Future connections between Nobel Drive and Irish Lane may be considered via extensions of "Parks Road" and "Muriel Lane" south of the MPN boundary.

Syene Road passes through the eastern portion of the MPN and is classified by the City of Fitchburg and MPO as a north-south major collector facility connecting Irish Lane on the south to the USH 12/14/18/151 Beltline (via McCoy Road) on the north. The speed limit is 35-mph south of Irish Lane and 45-mph north of Irish Lane. With the construction of a USH 14/Lacy Road interchange, the USH 14/McCoy Road interchange to the north, and thus Syene Road north of Lacy Road, is not expected to be heavily utilized by the MPN. Note that a dormant rail corridor right-of-way abuts the east side of the Syene Road right-of-way. When the rail corridor is returned for transit, the Syene Road intersections with Lacy Road, the future Nobel Drive-Extended, and Irish Lane will need to be properly designed for safe rail crossings.

Nobel Drive, located approximately half the distance between Lacy Road and Irish Lane, is an east-west facility that currently terminates east of Research Park Drive. The speed limit is 35-mph on this existing stretch of roadway. The plan is to extend Nobel Drive east through the MPN to Syene Road, then continue the route north-northeast to intersect with Lacy Road. The City of Fitchburg identifies Nobel Drive as a future minor collector route between Fish Hatchery Road and Lacy Road, while the MPO shows the route as a collector route between Fish Hatchery Road and Syene Road. MPO mapping should be updated to show Nobel Drive as a collector roadway to its intersection with Lacy Road. Nobel Drive will serve as the primary route to and through the MPN. The intersection of Syene Road with Nobel Drive will need to be carefully designed and constructed to minimize impacts to an existing neighborhood to the northwest of the intersection, environmentally sensitive areas to the west and south of the intersection, wetland corridors and tree specimens east of the intersection, and the rail crossing along the east side of Syene Road.

Fahey Glen is a north-south street that currently terminates south of Lacy Road and has a speed limit of 35-mph. The plan is to extend Fahey Glen south into the MPN where it will intersect Nobel Drive from the north. The City of Fitchburg is planning to eventually make a connection of Fahey Glen between Lacy Road and East Cheryl Parkway – likely with phase one of the MPN. A two-leg roundabout is currently in place along East Cheryl Parkway where this connection would occur. The City of Fitchburg identifies the future Fahey Glen as a minor collector roadway between East Cheryl Parkway and the MPN area. The MPO identifies the route as a collector roadway between East Cheryl Parkway and Irish Lane. Note that the MPN does not include a connection between the MPN south boundary and Irish Lane due to the Steering Committee desire to minimize connections between urban Fitchburg and rural Fitchburg. MPO mapping should to be updated to show Fahey Glen as a minor collector roadway between East Cheryl Parkway and Nobel Drive.

East Cheryl Parkway is a two-lane east-west undivided collector street from west of Fish Hatchery Road to approximately 450-feet west of the future East Cheryl Parkway intersection with Fahey Glen. It then transitions to a two-lane divided collector street east to Syene Road. When the new USH 14 interchange with Lacy Road is built, East Cheryl Parkway will be extended east of Syene Road as a major collector, continue over the rail corridor and intersect with the Lacy Road realignment as a tee-intersection from the west.

Research Park Drive is an existing north-south two-lane undivided local road with on–street parking and a 30-mph posted speed limit that extends from East Cheryl Parkway on the north to approximately 435-feet south of Nobel Drive. The plan is to extend Research Park Drive south

to a future roadway, herein called "Monks Road", that will run east-west along the MPN south boundary.

Mica Road is an existing north-south two-lane undivided local road that extends south from Lacy Road approximately 1,320-feet. The speed limit is currently unposted, but is assumed to be 25-mph due to the existing residential nature of the surrounding land use. The plan is to extend Mica Road south to the future "Monks Road" that will run east-west along the MPN south boundary. Approximately two-thirds of the road will pass through residential neighborhoods, with the middle one-third passing through a business park land use.

Notre Dame Drive is an existing north-south two-lane undivided local road that extends south from Lacy Road approximately 100-feet. The plan is to extend Notre Dame Drive south to Nobel Drive and southwest to the future "Monks Road" that will run east-west along the MPN south boundary. This stretch of roadway will accommodate residential land uses. The MPN assumes the City will extend Notre Dame Drive north of Lacy Road to East Cheryl Parkway at a future date, but the connection north of Lacy Drive is not driven by the MPN. Consideration should be given to classifying Notre Dame Drive as a minor collector facility in the future.

Jones Farm Drive, a two-lane undivided north-south road that currently intersects Lacy Road as a tee-intersection from the north, is planned to extend from Lacy Road south-southeast to the existing dead-end of Tarpleywick Drive. Tarpleywick Drive services land use area 18, an existing neighborhood immediately west of Syene Road approximately half-way between Lacy Road and Irish Lane. The Jones Farm Drive/Tarpleywick Drive extensions will service residential and transit-oriented development in the southwest corner of Lacy Road and Syene Road.

D2. Alternative Modes of Transportation

The City of Fitchburg has recently completed a bicycle and pedestrian plan that includes several improvements for the study area. Maps taken from the bicycle and pedestrian plan are included in Appendix A.

Additional pedestrian and bicycle facilities are recommended throughout the MPN as a means to reduce motorized vehicle traffic, provide alternative means of transportation, and provide for recreation. More specifically, sidewalks are recommended along all roadways in the plan area, multi-use trails traverse on and off-road in the plan, and on-street bicycle lanes are recommended in select areas. See Exhibit 2-4 for a diagram of proposed roadway cross-sections. See Exhibit 2-5 for a diagram of potential multi-use trails.

Madison Metro operates on-street bus routes 44 and 48 between the Fish Hatchery Road intersection with Nobel Drive in Fitchburg, through the South Transfer Station of Madison, and north through the University of Wisconsin-Madison campus. In combination there are 5 departures/4 arrivals during the weekday morning hours and 4 departures/5 arrivals during the weekday evening hours. This equates to 9 complete trips during weekdays and no trips during weekends. Strong consideration is being given to expanding transit service in the area. See Exhibit 2-6 for the paths of existing routes 44 and 48 and potential future bus routing. A dormant rail corridor along the east side of Syene Road is also being considered for future light rail transit or bus rapid transit. The MPN specifically focuses transit oriented land uses along this rail corridor.

NORTH
NOT TO SCALE

EAST CHERYL PKWY
EAST CHERYL PKWY
LACY RD
LACY RD
FISH HATCHERY RD
MICA RD
FAHEY GLEN
NOTRE DAME
JONES FARM
SYENE RD
INTERCHANGE RD
NOBEL DR
NOBEL DR
"MIXED USE" RD
"MONKS" RD
"PARKS"
"MURIEL"
IRISH LANE
SYENE RD
RAILROAD R.O.W.
EAST HILL
USH 14

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 2-1
MPN STUDY AREA ROADWAYS & INTERSECTIONS
FITCHBURG, WISCONSIN

McGAW PARK
Neighborhood Plan

City of Fitchburg, WI

Growth Model

DRAFT

LEGEND

- Study Area Boundary
- TS — Transit Station
- R2 — Residential (minimum average density of 10 du/ac)
- R1 — Residential (minimum average density of 5 du/ac)
- MU — Mixed Use (Office/Residential)
- TOD — Transit Oriented Development
- PO — Parks & Open Space
- Existing Parks
- ES — Environmentally Sensitive Areas
- BP — Business Park
- I — Institutional
- Proposed Roads
- Existing Path (RPC)
- Existing Path
- Proposed Path
- Greenway/Pedestrian Trail
- Heritage Trees
- Specimen *
- Wetlands
- Wetland Buffer (75 ft)
- Wetland Buffer (300 ft)
- Creek/Waterway
- Drainageway
- Non-Navigable Drainageway

Last Revised: February 3, 2009

GIS map files provided by City of Fitchburg & Capital Area RPC
Maps prepared by TAI | MARS | NRC | TAD

0 750 1,500 3,000 Feet

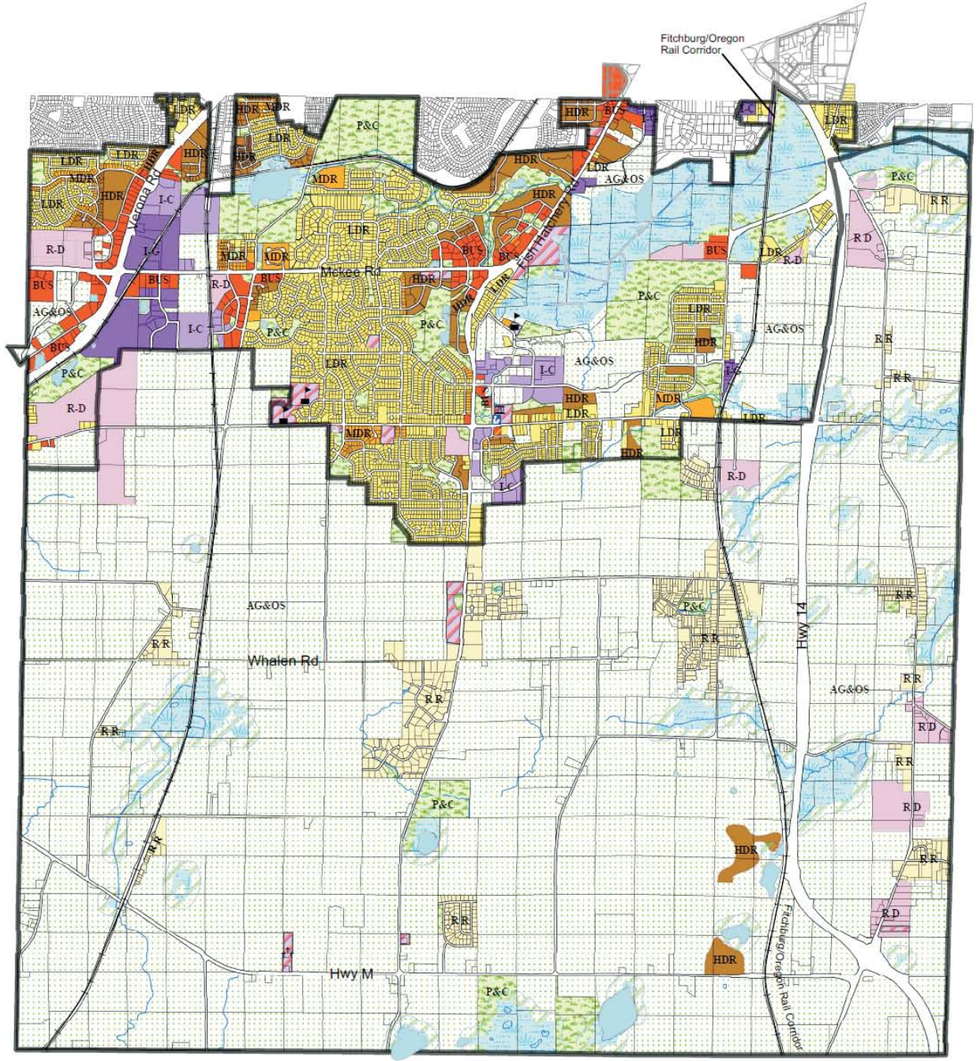
THIS IS THE DRAFT GROWTH MODEL. *See Exhibits 2-1 and 2-4 to 2-6 for more accurate locations of roadways, intersections, trails, and potential transit routes.*

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 2-2
MPN GROWTH MODEL
FITCHBURG, WISCONSIN

2007 EXISTING LAND USE MAP



P&C - PARK & CONSERVANCY
R-R - RURAL RESIDENTIAL
LDR - LOW DENSITY RESIDENTIAL
MDR - MEDIUM DENSITY RESIDENTIAL
HDR - HIGH DENSITY RESIDENTIAL
M-U - MIXED-USE
G / I - GOVERNMENT / INSTITUTIONAL

I-G - INDUSTRIAL-GENERAL
I-C - INDUSTRIAL-COMMERCIAL
BUS - BUSINESS
R-D - RURAL DEVELOPMENT
AG&OS - AGRICULTURE & OPEN SPACE
OPEN WATER
WETLANDS W/ 300 FT BUFFER

PARCELS
STREAMS
CITY HALL
SCHOOL

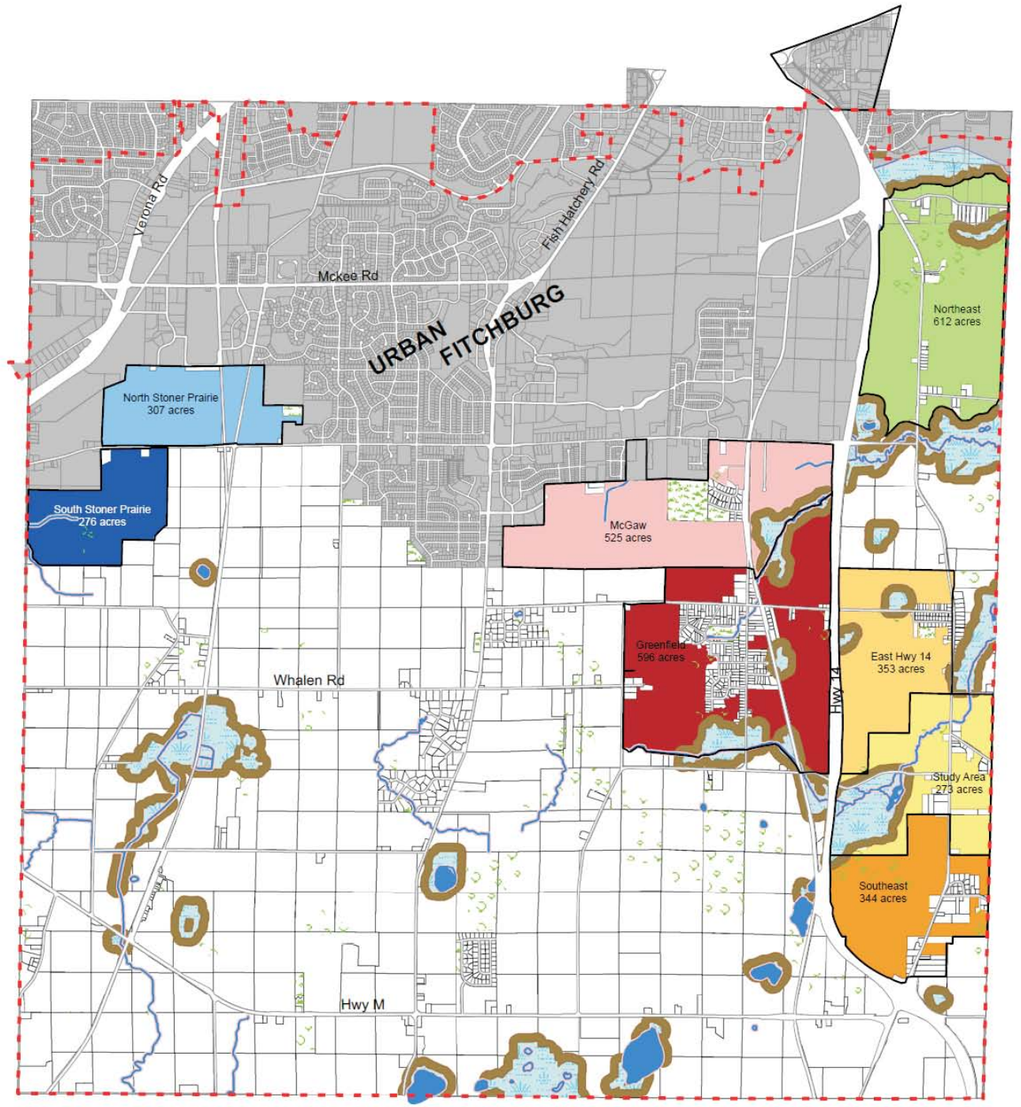
FIRE STATION
LIBRARY
CEMETERY

N

PREPARED BY: PLANNING/ZONING
SOURCE: PLANNING/ZONING
REVISED: 12/2008

FITCHBURG Planning/Zoning

FUTURE URBAN GROWTH AREA NEIGHBORHOODS



Wetlands
Wetland Buffer - 300'
Parks
Streams
Open Water
Water Buffer - 75'
Woods
City Boundary

Prepared by: Planning/Zoning
Source: Planning/Zoning & Dane County LIO
Revised: 2/2008

N

* Acreage is exclusive of mapped natural resources, buffers and parcels less than 5 acres.

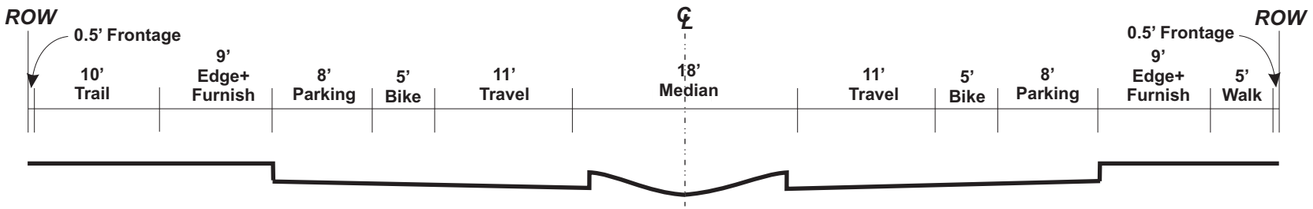
FITCHBURG Planning/Zoning

TRAFFIC ANALYSIS & DESIGN, INC.

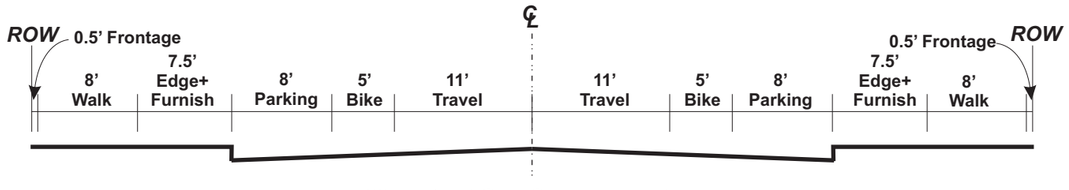
EXHIBIT DATE: 05-08-09

Source: DRAFT Fitchburg Comprehensive Plan, downloaded December 10, 2008 (http://www.city.fitchburg.wi.us/)

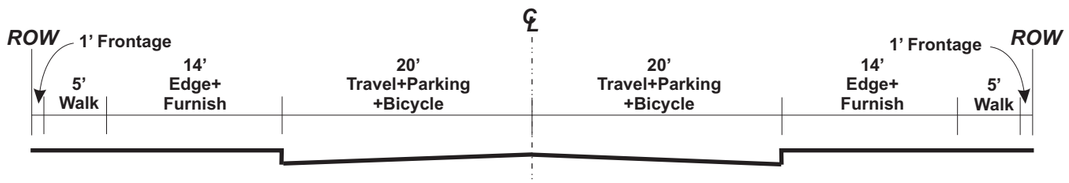
EXHIBIT 2-3
FITCHBURG YEAR 2007 EXISTING LAND USE MAP &
DRAFT FUTURE URBAN GROWTH AREA NEIGHBORHOODS
FITCHBURG, WISCONSIN



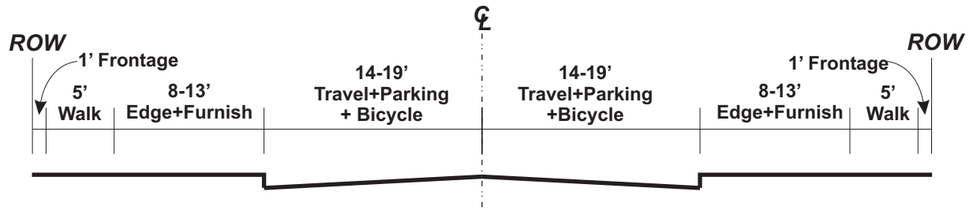
100' WIDE RIGHT-OF-WAY
Nobel Drive Extended



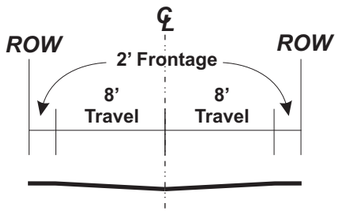
80' WIDE RIGHT-OF-WAY - TYPE A
Research Park Drive Extended to "Mixed Use Road", "Mixed Use Road", & Primary TOD Roadways



80' WIDE RIGHT-OF-WAY - TYPE B
Fahey Glen Extended



66' WIDE RIGHT-OF-WAY
Other roadways within the McGaw Park Neighborhood Plan; Reduced ROW may be considered on a case by case basis on local residential streets as development occurs



20' WIDE RIGHT-OF-WAY
Alleys

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 2-4
PROPOSED ROADWAY CROSS-SECTIONS
FITCHBURG, WISCONSIN

NORTH
NOT TO SCALE

EAST CHERYL PKWY
EAST CHERYL PKWY
LACY RD
LACY RD
FISH HATCHERY RD
MICA RD
FAHEY GLEN
JONES FARM
SYENE RD
INTERCHANGE RD
NOBEL DR
NOBEL DR
NOTRE DAME
"MIXED USE" RD
"MONKS" RD
"PARKS"
"MURIEL"
SYENE RD
RAILROAD R.O.W.
USH 14
IRISH LANE

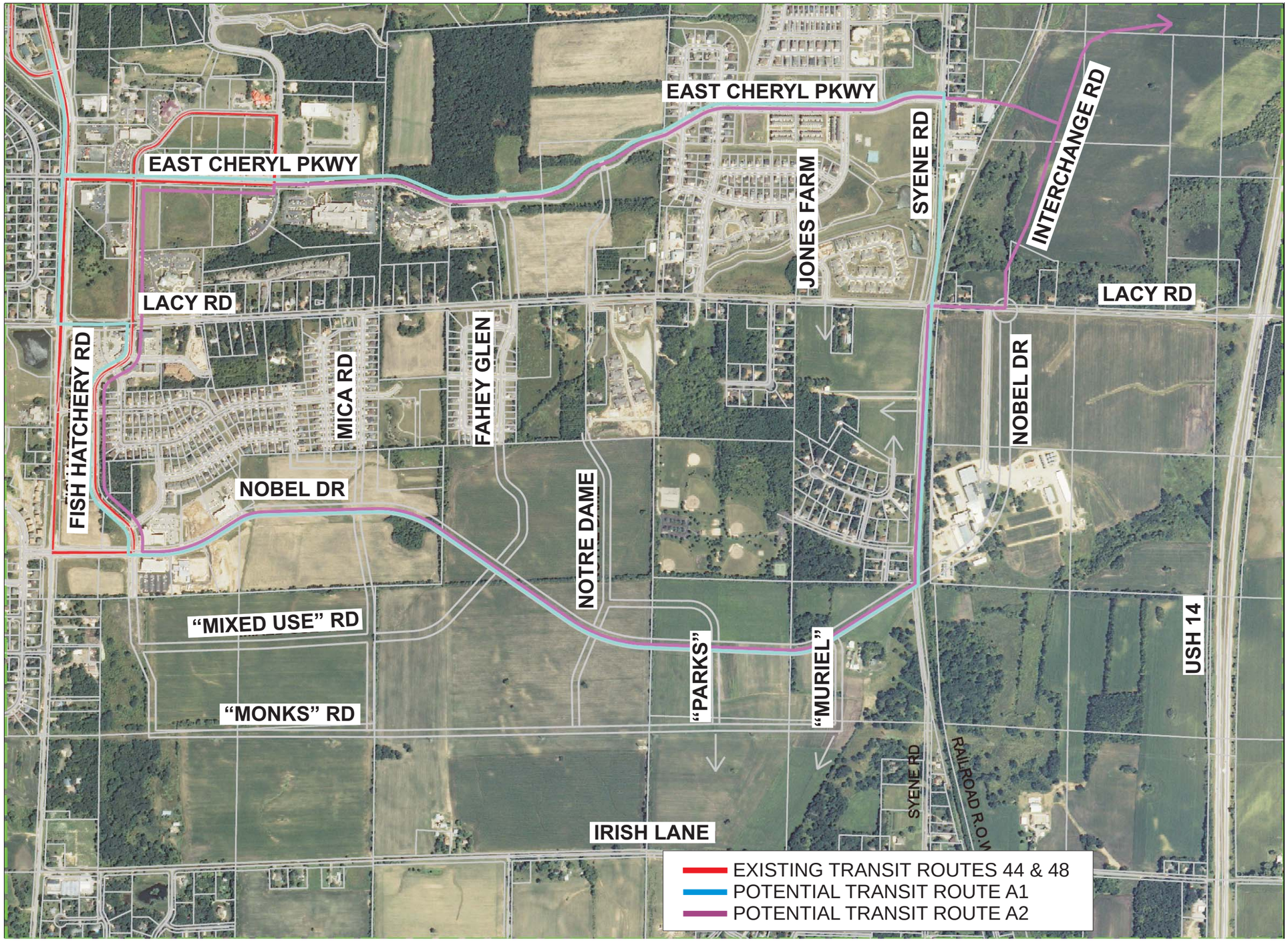
EXISTING OR RPC PROPOSED MULTI-USE TRAIL
MPNP PROPOSED MULTI-USE TRAIL

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 2-5
PROPOSED MULTI-USE TRAILS
FITCHBURG, WISCONSIN

NORTH
NOT TO SCALE



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 2-6
POTENTIAL TRANSIT IMPROVEMENTS
FITCHBURG, WISCONSIN

CHAPTER III – ANALYSIS OF EXISTING CONDITIONS

PART A – PHYSICAL CHARACTERISTICS

Exhibit 3-1a shows the Year 2009 anticipated transportation detail for the study area intersections and roadways, which assumes completion of the planned improvement to Fish Hatchery Road. Exhibit 3-1b shows the future anticipated transportation detail after the planned improvement to Fish Hatchery Road, planned improvements to the Lacy Road corridor, construction of a USH 14/Lacy Road interchange, and connections between Lacy Road and East Cheryl Parkway. Reference Chapter II, Part B, Section B2 for further discussion relating to these planned projects.

PART B – TRAFFIC VOLUMES

Weekday morning and weekday evening peak hour turning movement counts were conducted by Traffic Analysis & Design, Inc. in late spring of 2008, while school was still in session, at the following intersections:

- Fish Hatchery Road & East Cheryl Parkway
- East Cheryl Parkway & Research Park Drive
- Fish Hatchery Road & Lacy Road
- Lacy Road & Research Park Drive
- Lacy Road & Mica Road
- Lacy Road & Fahey Glen
- Lacy Road & Syene Road
- Fish Hatchery Road & Nobel Drive
- Nobel Drive & Research Park Drive
- Fish Hatchery Road & Irish Lane
- Irish Lane & East Hill Drive
- Irish Lane & Syene Road.

Based on the turning movement counts, the weekday morning and weekday evening peak hours were identified as being 7:00 to 8:00am and 4:15 to 5:15pm. The calculation of peak hour factors and truck percents for each intersection have been included in Appendix A following this report. The Year 2008 existing traffic volumes are shown in Exhibit 3-2.

PART C – CAPACITY LEVEL OF SERVICE

C1. Level of Service Definitions

The study area intersections were analyzed based on the procedures set forth in the *2000 Highway Capacity Manual* (HCM). Intersection operation is defined by "level of service". Level of service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. For the purpose of this study, LOS D was used to define desirable peak hour operating conditions. Descriptions of the various levels of service are as follows:

LOS A is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. At signalized and unsignalized intersections, average delays are less than 10 seconds.

LOS B represents stable operation. At signalized intersections, average vehicle delays are 10 to 20 seconds. At unsignalized intersections, average delays are 10 to 15 seconds.

LOS C still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not objectionably so. At signalized intersections, average vehicle delays are 20 to 35 seconds. At unsignalized intersections, average delays are 15 to 25 seconds.

LOS D represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups. At signalized intersections, average vehicle delays are 35 to 55 seconds. At unsignalized intersections, average delays are 25 to 35 seconds.

LOS E represents the capacity of the intersection. At signalized intersections, average vehicle delays are 55 to 80 seconds. At unsignalized intersections, average delays are 35 to 50 seconds.

LOS F represents jammed conditions where the intersection is over capacity and acceptable gaps for unsignalized intersections in the mainline traffic flow are minimal. At signalized intersections, average vehicle delays exceed 80 seconds. At unsignalized intersections, average delays exceed 50 seconds.

C2. Year 2008 Existing Traffic Operating Conditions

Exhibit 3-3 shows the Year 2008 existing traffic (no MPN) peak hour operating conditions at the study area intersections. The analysis was conducted using intersection geometrics and traffic signal sequencing anticipated upon completion of the Fish Hatchery Road improvements in the Year 2009 (see Exhibit 3-1a).

As Exhibit 3-3 shows, Lacy Road eastbound movements at Syene Road currently operate at LOS E/F conditions during the peak hours analyzed.

PART D – SOURCES OF DATA

The following sources of data were obtained for use in conducting this traffic study.

- Transportation details – Traffic Analysis & Design, Inc.
- Turning movement traffic counts – Traffic Analysis & Design, Inc.
- Traffic forecast information – Madison Area MPO
- Traffic signal sequencing & timing – City of Madison
- MPN Growth Model – Teska Associates, Inc.
- Non-MPN related bicycle & pedestrian planning information – City of Fitchburg Bicycle & Pedestrian Plan, adopted July 22, 2008 and downloaded December 10, 2008 (http://www.city.fitchburg.wi.us/)
- Non-MPN related transit information – Madison Metro *Ride Guide*, effective Oct. 5, 2008

- Existing and future land use maps – Land use element of the DRAFT Fitchburg Comprehensive Plan, downloaded December 10, 2008 (http://www.city.fitchburg.wi.us/)

LEGEND:

- TRAFFIC SIGNAL
- STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- XX' ANTICIPATED TURN-BAY LENGTH (IN FEET)
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION

NORTH
NOT TO SCALE

FISH HATCHERY ROAD (CTH D)

RESEARCH PARK DRIVE

SYENE ROAD

EAST CHERYL PARKWAY

JONES FARM DRIVE

CHERYL DRIVE

LACY ROAD

LACY ROAD

MICA ROAD

FAHEY GLEN

NOTRE DAME

NOBEL DRIVE

IRISH LANE

EAST HILL DRIVE

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 3-1A
ANTICIPATED TRANSPORTATION DETAIL
AFTER FISH HATCHERY ROAD RECONSTRUCTION
FITCHBURG, WISCONSIN

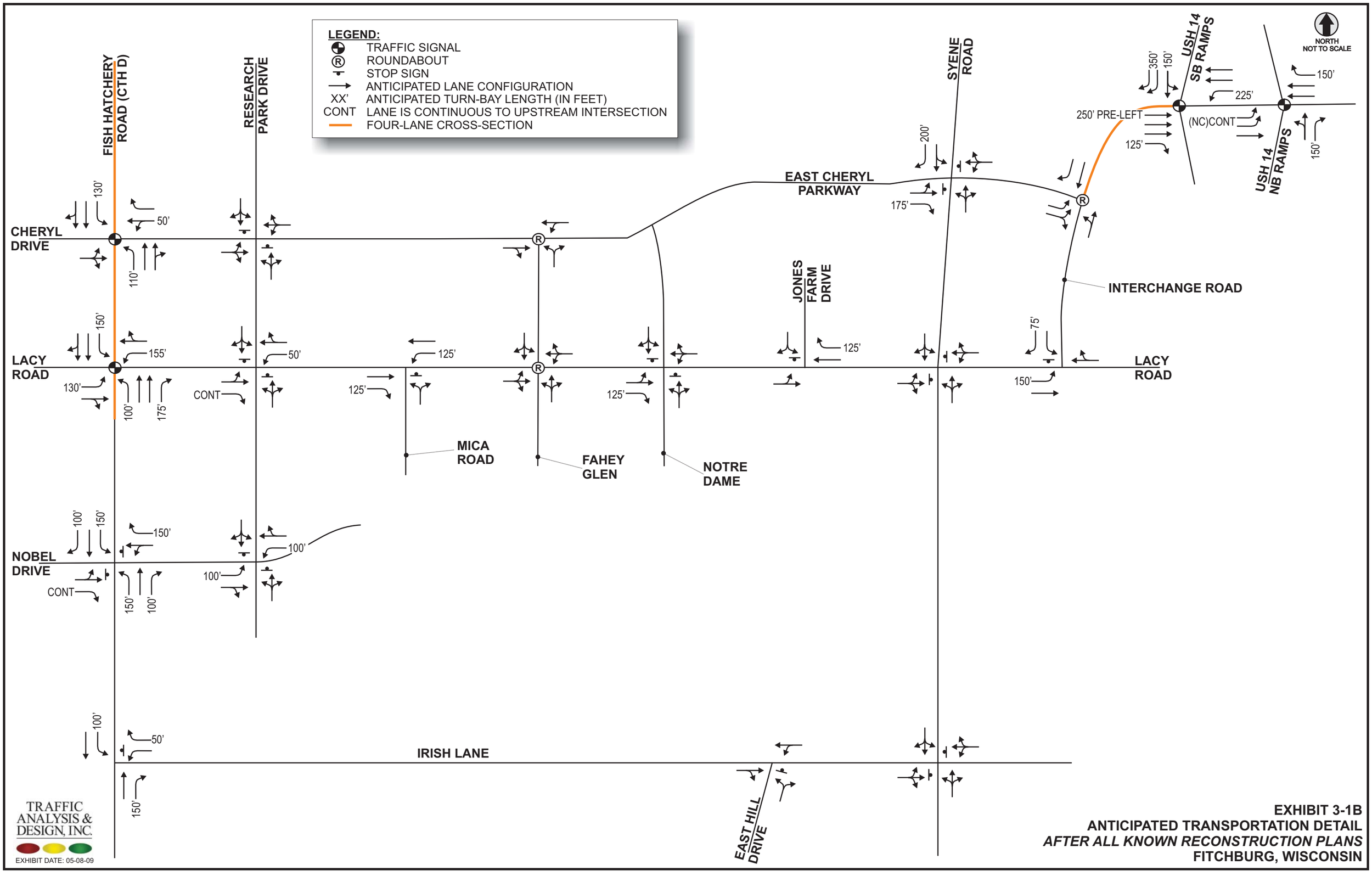
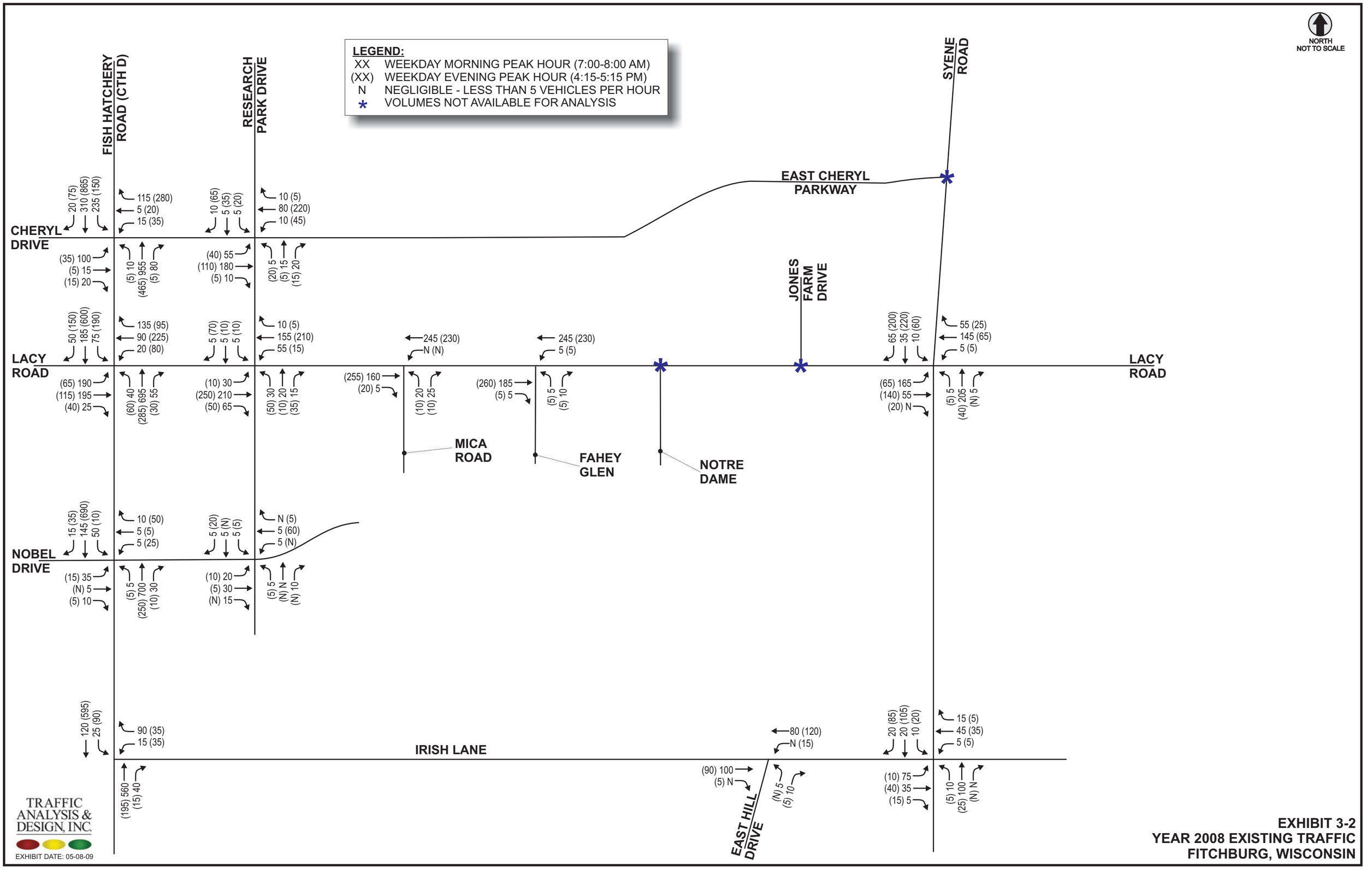


EXHIBIT 3-1B
ANTICIPATED TRANSPORTATION DETAIL
AFTER ALL KNOWN RECONSTRUCTION PLANS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 3-2
YEAR 2008 EXISTING TRAFFIC
FITCHBURG, WISCONSIN

Year 2008 Existing Traffic Peak Hour Operating Conditions
Anticipated Geometrics, After Fish Hatchery Road Reconstruction

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & EastCheryl Parkway	Traffic Signal	AM	C	C	C	C	C	C	B	C	C	D	A	A
		PM	B	B	B	B	B	C	B	B	B	A	A	A
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	B	B	B	C	D	D	C	C	B	B	B	B
		PM	B	B	B	C	D	D	C	C	C	B	B	B
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	D	D	D	B	B	B
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Syene Road	Two-Way Stop	AM	**E**	**E**	**E**	C	C	C	A	A	A	A	A	A
		PM	**F**	**F**	**F**	C	C	C	A	A	A	A	A	A
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	C	C	A	C	C	C	A	A	A	B	A	A
		PM	C	C	B	C	C	B	A	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	A	A	A
		PM	A	A	A	A	A	A	A	A	A	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	C	-	A	A	A	A	-
		PM	-	-	-	D	-	A	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	A	-	A	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	B	B	B	B	B	B	A	A	A	A	A	A
		PM	B	B	B	B	B	B	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 3-3
YEAR 2008 EXISTING TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *NO IMPROVEMENTS*
FITCHBURG, WISCONSIN

CHAPTER IV – FORECASTED TRAFFIC

PART A – BACKGROUND TRAFFIC FORECASTING

ADT turning movement forecasts were completed by the Madison Area MPO to identify expected Year 2025 and Year 2035 background traffic volumes (no MPN) at the study area intersections. The Year 2025 background traffic forecasts were based on the MPO's Year 2030 model, which reflects development anticipated by the MPO by Year 2030. The Year 2035 background traffic forecasts were based on the MPO's "ultimate" model, which assumes complete potential build-out of the Madison Urbanized Area. All MPO forecasts are included in Appendix A.

This TIA utilizes weekday morning and evening peak hour analysis to determine improvements. The following steps were taken to determine peak hour volumes from the MPO ADT turning movement forecasts:

1. Comparing existing traffic counts to existing daily traffic counts, it was determined that approximately 11-percent and 12-percent of daily traffic occurs during the weekday morning and evening peak hours, respectively. That is, approximately 23-percent of the daily traffic occurs during these two peak hours combined.
2. Using the existing traffic turning movement counts, an existing ADT was approximated for each movement by dividing the sum of the morning and evening volumes for the particular movement by 23-percent.
3. The Year 2025 and Year 2035 background traffic peak hour volumes were determined by multiplying each existing peak hour turning volume by the MPO turning movement ADT, then dividing the result by the approximated existing turning movement ADT.
4. Movements not included in the MPO forecasts were determined by utilizing a 1.5-percent annual growth rate applied to the existing turning movement volume. These movements were typically low volume under existing conditions.

Steps 1 through 4 above only apply to intersections where existing counts are available. The following additional steps were taken where no counts are available or where the intersections themselves are not yet constructed (e.g. the USH 14 ramps).

5. At the remaining intersections, peak hour volumes were balanced from upstream/downstream intersections and assigned based on the proportion of MPO provided ADTs. For example, if the MPO forecast shows an approach with 10-percent left-turns, 75-percent throughs, and 15 percent right-turns, the volumes entering from the upstream intersection were assigned based on those percentages.
6. In cases where no upstream or downstream balancing is possible (e.g. southbound left-turn traffic from the USH 14 ramps), volumes were determined by using ratios to other approach volumes calculated in step 5.

The resulting Year 2025 background traffic volumes are shown in Exhibit 4-1. The resulting Year 2035 background traffic volumes are shown in Exhibit 4-2.

PART B – DEVELOPMENT TRAFFIC FORECASTING

B1. Trip Generation

The traffic volumes expected to be generated by the development are based on the type and density of the proposed land uses, and on trip rates as published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 7th Edition, 2003*.

Total Traffic Trip Generation Tables

The full build total traffic trip generation tables for the MPN are shown in Exhibit 4-3a. ITE provides fitted curve equations (FCE) that can be used to account for linking within a specific land use when the land use density is relatively large. To aid the user of this TIA, a second trip generation table is shown in Exhibit 4-3a to illustrate the project specific trip rate that is realized by using the FCE. Exhibit 4-3a also shows trip generation total traffic volumes broken down by the MPN land use areas.

Trip Generation Tables by TAZ, Including Residential to Non-Residential Linked Trips

To aid in the trip assignment procedure, the MPN was divided into eight traffic analysis zones (TAZ), lettered A through H. A map of the TAZs is shown in Exhibit 4-3b. The following MPN land use areas are included in each TAZ:

- TAZ A: Area 1
- TAZ B: Areas 2, 3 & 4
- TAZ C: Areas 5, 6 & 7
- TAZ D: Areas 8, 9 & 19
- TAZ E: Areas 10, 11, 12, 13 & 14
- TAZ F: Areas 15, 16, 17 & 18
- TAZ G: Areas 20 & 21
- TAZ H: Areas 22, 23 & 24

The Year 2025 (MPN phase one plus phase two) trip generation tables broken out by phase are shown in Exhibits 4-3c and 4-3d. These tables show linked trips within each TAZ and between TAZ. It was assumed that approximately 15-percent of the residential trips would be linked to non-residential uses.

The Year 2035 (MPN full build) trip generation tables broken out by phase are shown in Exhibits 4-3e and 4-3f. These tables also show linked trips within each TAZ and between TAZ. It was again assumed that approximately 15-percent of the residential trips would be linked to non-residential uses.

B2. Trip Distribution

The MPO provided Year 2025 and Year 2035 build traffic ADTs (with MPN), which are included in Appendix A. A clear cut trip distribution could not be determined based on the MPO forecasts, since subtracting the MPO background traffic forecasts from their build traffic forecasts in some cases yielded negative results. Therefore, a method of trial-and-error was used to distribute traffic to the study area to determine reasonable results. The following trip distributions, shown in Exhibit 4-4, were utilized.

TAZ A, B, C, G & H

- 20-percent to/from the north on Fish Hatchery Road
- 15-percent to/from the south on Fish Hatchery Road
- 5-percent to/from the north on Syene Road
- 5-percent to/from the south on Syene Road
- 5-percent to/from the north on USH 14 at Interchange Road
- 10-percent to/from the east on Interchange Road
- 10-percent to/from the west on Lacy Road
- 5-percent to/from the east on Lacy Road
- 5-percent to/from the east on Irish Lane.
- 20-percent linked to/from bordering growth areas and multi-modal trips combined**.**

TAZ D, E & F

- 5-percent to/from the north on Fish Hatchery Road
- 5-percent to/from the south on Fish Hatchery Road
- 5-percent to/from the north on Syene Road
- 10-percent to/from the south on Syene Road
- 20-percent to/from the north on USH 14 at Interchange Road
- 10-percent to/from the east on Interchange Road
- 10-percent to/from the west on Lacy Road
- 10-percent to/from the east on Lacy Road
- 5-percent to/from the east on Irish Lane.
- 20-percent linked to/from bordering growth areas and multi-modal trips combined**.**

As shown above, to obtain trip assignments that reasonable reflect MPO model forecasts, approximately 20-percent of the development new trips were assumed to link to/from bordering growth areas and/or be multi-modal trips.

In total, with the 15-percent residential to non-residential linked trips, and with the 20-percent linked to/from bordering growth areas and multi-modal trips, the math works out such that approximately a 25-percent reduction of the total trip generation is realized.

B3. Trip Assignment

New trips were assigned to the study area intersections based on trip distributions as previously described. The residential to non-residential linked trips were assigned based on their respective origins and destinations. The MPN Year 2025 trip assignment is shown in Exhibit 4-5. The MPN Year 2035 trip assignment is shown in Exhibit 4-6.

PART C – BUILD TRAFFIC

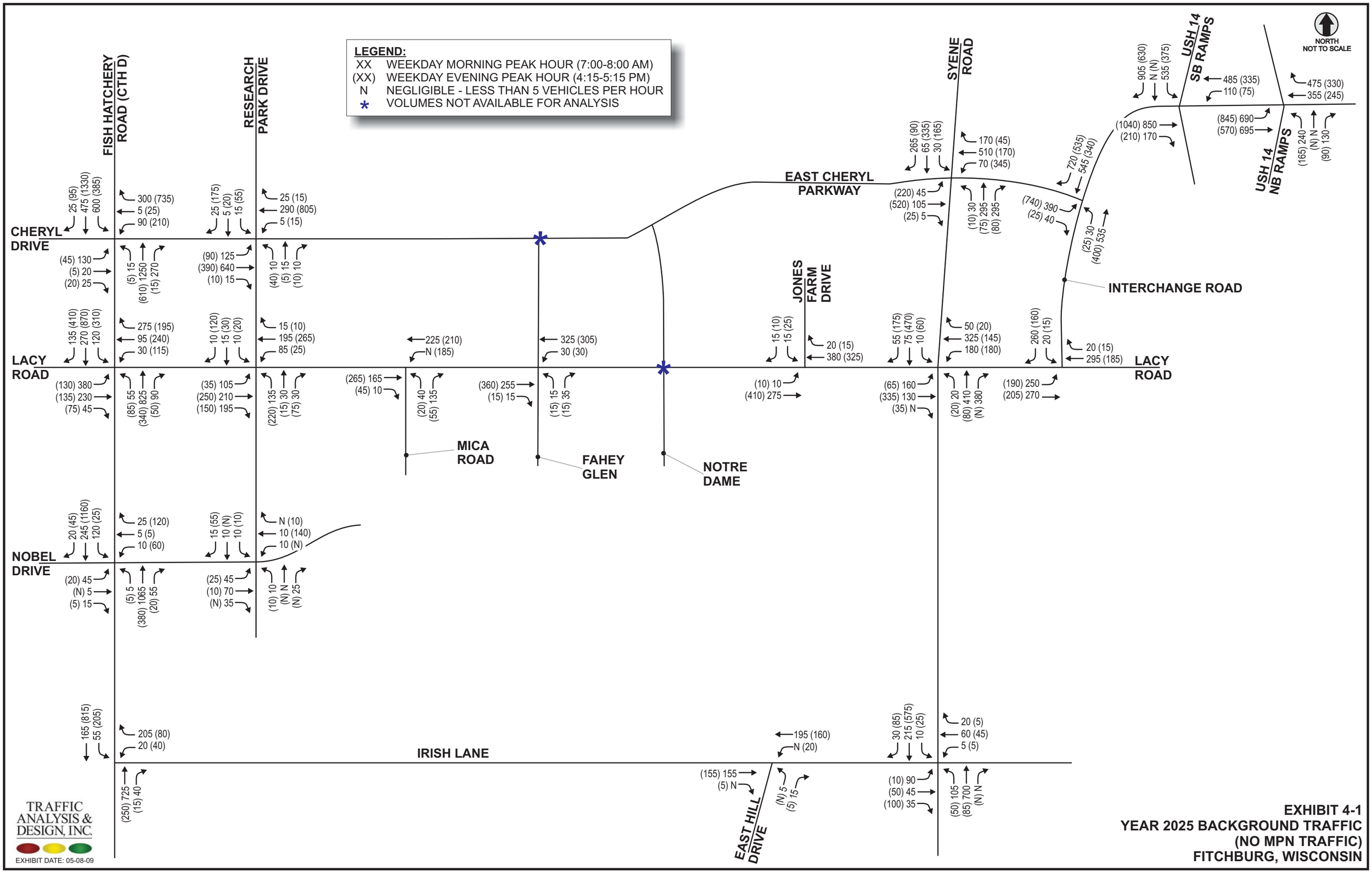
Easier travel paths for non-MPN related traffic present themselves with new roadways and new traffic demands created by the MPN. For example, instead of making a westbound left-turn at

the Lacy Road intersection with Syene Road, some traffic from Interchange Road and Lacy Road were assumed reassign to southbound on Nobel Drive to make a westbound left-turn at the Nobel Drive intersection with Syene Road. As another example, to obtain volumes that more closely resemble MPO volumes, some background traffic was assumed to relocate from Fish Hatchery Road and Syene Road to USH 14. The Year 2025 background traffic and Year 2035 background traffic with trip diversions are shown in Exhibits 4-7 and 4-8, respectively.

Year 2025 build traffic volumes, which include phase one plus phase two of the MPN, were determined by adding the Year 2025 background traffic with trip diversions (Exhibit 4-7) to the MPN Year 2025 trip assignment (Exhibit 4-5). The Year 2025 build traffic volumes are shown in Exhibit 4-9.

Year 2035 build traffic volumes, which include full build of the MPN, were determined by adding the Year 2035 background traffic with trip diversions (Exhibit 4-8) to the MPN Year 2025 trip assignment (Exhibit 4-6). The Year 2035 build traffic volumes are shown in Exhibit 4-10.

MPO ADT forecasts are shown in Exhibit 4-11 with more details provided in Appendix A.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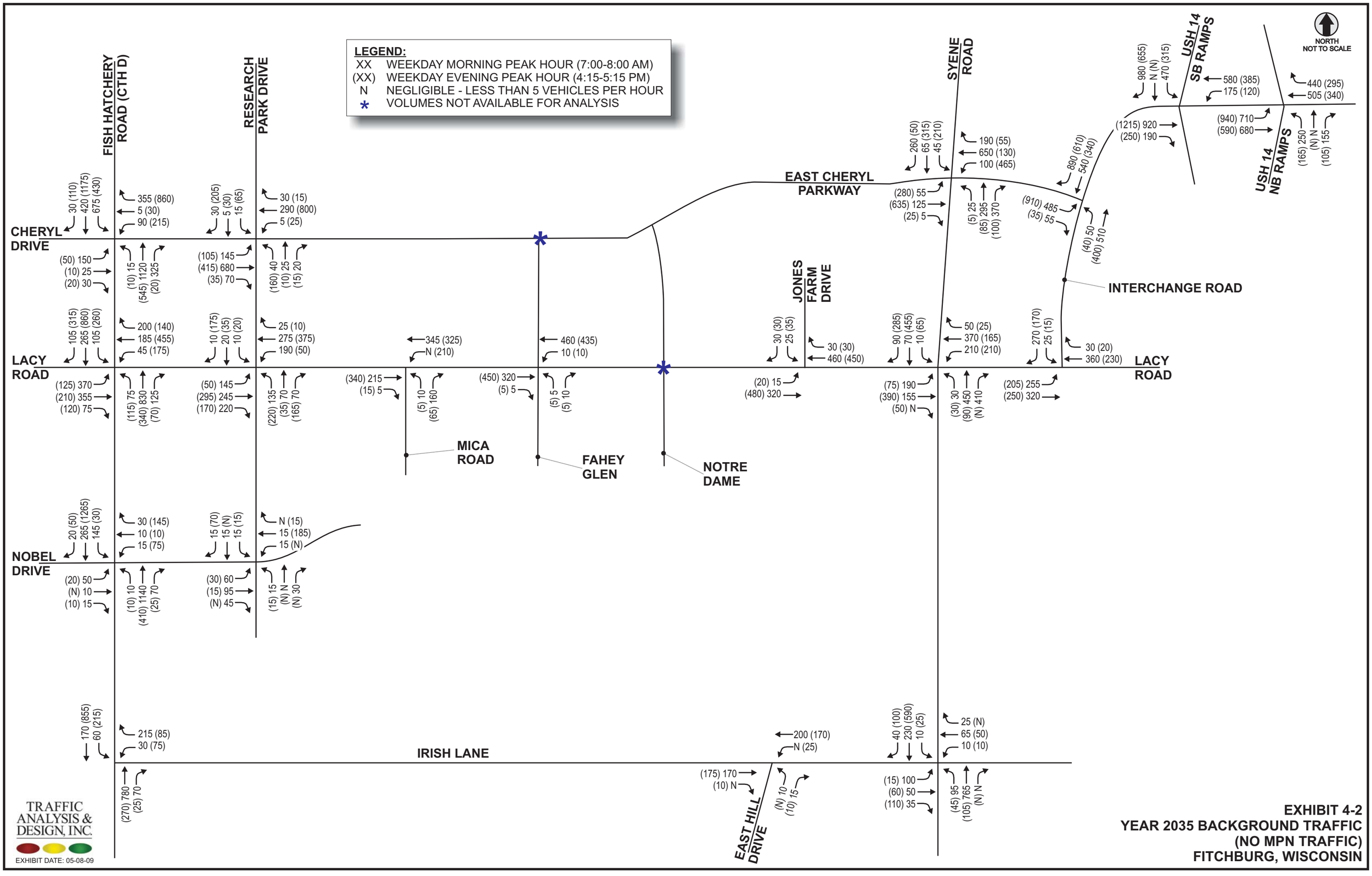
(XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR
* VOLUMES NOT AVAILABLE FOR ANALYSIS
NORTH
NOT TO SCALE
FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
EAST CHERYL PARKWAY
JONES FARM DRIVE
INTERCHANGE ROAD
CHERYL DRIVE
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE
TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09
EXHIBIT 4-1
YEAR 2025 BACKGROUND TRAFFIC
(NO MPN TRAFFIC)
FITCHBURG, WISCONSIN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(XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR
* VOLUMES NOT AVAILABLE FOR ANALYSIS
NORTH
NOT TO SCALE
FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
EAST CHERYL PARKWAY
JONES FARM DRIVE
INTERCHANGE ROAD
CHERYL DRIVE
LACY ROAD
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE
MICA ROAD
FAHEY GLEN
NOTRE DAME
30 (110) 420 (1175) 675 (430)
355 (860) 5 (30) 90 (215)
30 (205) 5 (30) 15 (65)
30 (15) 290 (800) 5 (25)
260 (50) 65 (315) 45 (210)
190 (55) 650 (130) 100 (465)
980 (655) N (N) 470 (315)
580 (385) 175 (120)
440 (295) 505 (340)
(1215) 920 (250) 190
(940) 710 (590) 680
(165) 250 (N) N (105) 155
890 (610) 540 (340)
(910) 485 (35) 55
(40) 50 (400) 510
(280) 55 (635) 125 (25) 5
(5) 25 (85) 295 (100) 370
(50) 150 (10) 25 (20) 30
(10) 15 (545) 1120 (20) 325
(105) 145 (415) 680 (35) 70
(160) 40 (10) 25 (15) 20
105 (315) 265 (860) 105 (260)
200 (140) 185 (455) 45 (175)
10 (175) 20 (35) 10 (20)
25 (10) 275 (375) 190 (50)
345 (325) N (210)
460 (435) 10 (10)
30 (30) 25 (35)
30 (30) 460 (450)
90 (285) 70 (455) 10 (65)
50 (25) 370 (165) 210 (210)
270 (170) 25 (15)
30 (20) 360 (230)
(125) 370 (210) 355 (120) 75
(115) 75 (340) 830 (70) 125
(50) 145 (295) 245 (170) 220
(220) 135 (35) 70 (165) 70
(340) 215 (15) 5
(5) 10 (65) 160
(450) 320 (5) 5
(5) 5 (5) 10
(20) 15 (480) 320
(75) 190 (390) 155 (50) N
(30) 30 (90) 450 (N) 410
(205) 255 (250) 320
20 (50) 265 (1265) 145 (30)
30 (145) 10 (10) 15 (75)
15 (70) 15 (N) 15 (15)
N (15) 15 (185) 15 (N)
(20) 50 (N) 10 (10) 15
(10) 10 (410) 1140 (25) 70
(30) 60 (15) 95 (N) 45
(15) 15 (N) N (N) 30
170 (855) 60 (215)
215 (85) 30 (75)
200 (170) N (25)
40 (100) 230 (590) 10 (25)
25 (N) 65 (50) 10 (10)
(270) 780 (25) 70
(175) 170 (10) N
(N) 10 (10) 15
(15) 100 (60) 50 (110) 35
(45) 95 (105) 765 (N) N
TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09
EXHIBIT 4-2
YEAR 2035 BACKGROUND TRAFFIC
(NO MPN TRAFFIC)
FITCHBURG, WISCONSIN

(1)

Full Build MPN Trip Generation Table - Total Trips with ITE FCE

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	1345.4 x 1,000 SF	15,210 FCE	1,535 (84%)	290 (16%)	1,825 FCE	380 (23%)	1,270 (77%)	1,650 FCE
General Office	710	832.5 x 1,000 SF	6,820 FCE	900 (88%)	120 (12%)	1,020 FCE	170 (17%)	840 (83%)	1,010 FCE
Retail	820	92.8 x 1,000 SF	3,980 (42.94)	60 (61%)	35 (39%)	95 (1.03)	170 (48%)	180 (52%)	350 (3.75)
Single-Family Housing (R-1)	210	175 Units	1,670 (9.57)	35 (25%)	95 (75%)	130 (0.75)	110 (63%)	65 (37%)	175 (1.01)
Townhomes (R-1)	230	262 Units	1,460 FCE	20 (17%)	90 (83%)	110 FCE	85 (67%)	45 (33%)	130 FCE
Apartments/Rental (R-2)	220	581 Units	3,640 FCE	60 (20%)	230 (80%)	290 FCE	220 (65%)	115 (35%)	335 FCE
Condominiums (R-2)	230	871 Units	4,040 FCE	50 (17%)	240 (83%)	290 FCE	240 (67%)	115 (33%)	355 FCE
Elementary School (I)	520	625 Students	810 (1.29)	125 (55%)	100 (45%)	225 FCE	70 (45%)	85 (55%)	155 FCE
Light Rail Transit Station	ITE Jrnl	384 Parking Spaces	1,350 (3.51)	225 (86%)	35 (14%)	260 (0.68)	55 (22%)	185 (78%)	240 (0.62)
Total Trips			**38,980**	**3,010**	**1,235**	**4,245**	**1,500**	**2,900**	**4,400**

FCE is an ITE provided fitted curve equation, which accounts for linking within a land use due to its large size.
R-1 Land use assumed to be 40% single-family housing and 60% Townhomes
R-2 Land use and other residential areas with greater than 7 du/ac assumed to be 40% apartments and 60% condominiums.
The elementary student population was assumed to be the average population given by ITE 520.
LRT lot size Assumes 128 spaces per acre on 3 of the available 5 acres. A parking space takes up about 340 sq ft, including aisle.
LRT Station rates & splits from June 1994 ITE Article "Trip Generation Rates for Light Rail Transit Park-and-Ride Lots".

(2)

Full Build MPN Trip Generation Table - Total Trips with Equivalent Trip Rates due to FCE

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	1345.4 x 1,000 SF	15,210 (11.31)	1,535 (84%)	290 (16%)	1,825 (1.36)	380 (23%)	1,270 (77%)	1,650 (1.23)
General Office	710	832.5 x 1,000 SF	6,820 (8.193)	900 (88%)	120 (12%)	1,020 (1.23)	170 (17%)	840 (83%)	1,010 (1.21)
Retail	820	92.8 x 1,000 SF	3,980 (42.94)	60 (61%)	35 (39%)	95 (1.03)	170 (48%)	180 (52%)	350 (3.75)
Single-Family Housing (R-1)	210	175 Units	1,670 (9.57)	35 (25%)	95 (75%)	130 (0.75)	110 (63%)	65 (37%)	175 (1.01)
Townhomes (R-1)	230	262 Units	1,460 (5.573)	20 (17%)	90 (83%)	110 (0.42)	85 (67%)	45 (33%)	130 (0.50)
Apartments/Rental (R-2)	220	581 Units	3,640 (6.27)	60 (20%)	230 (80%)	290 (0.50)	220 (65%)	115 (35%)	335 (0.58)
Condominiums (R-2)	230	871 Units	4,040 (4.64)	50 (17%)	240 (83%)	290 (0.33)	240 (67%)	115 (33%)	355 (0.41)
Elementary School (I)	520	625 Students	810 (1.29)	125 (55%)	100 (45%)	225 (0.36)	70 (45%)	85 (55%)	155 (0.25)
Light Rail Transit Station	ITE Jrnl	384 Parking Spaces	1,350 (3.51)	225 (86%)	35 (14%)	260 (0.68)	55 (22%)	185 (78%)	240 (0.62)
Total Trips			**38,980**	**3,010**	**1,235**	**4,245**	**1,500**	**2,900**	**4,400**

(3)

Year 2035 Full Build Total Trips by Area

Percent Complete	Parcel No.	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
100%	1 - BP	8,920	900	170	1,070	225	745	970
100%	2 - ES	0	0	0	0	0	0	0
100%	3 - MU	4,680	490	130	620	155	475	630
100%	4 - R2	520	10	30	40	30	15	45
100%	5 - I	810	125	100	225	70	85	155
100%	6 - R1	1,350	25	80	105	85	45	130
100%	7 - PO	0	0	0	0	0	0	0
100%	8 - R1	890	15	50	65	55	30	85
100%	9 - ES	0	0	0	0	0	0	0
100%	10 - ES	0	0	0	0	0	0	0
100%	11 - BP	6,290	635	120	755	155	525	680
100%	12 - TOD	7,570	370	205	575	325	480	805
100%	13 - TS	1,350	225	35	260	55	185	240
100%	14 - ES	0	0	0	0	0	0	0
100%	15 - TOD	2,520	125	75	200	110	155	265
100%	16 - R2	380	5	25	30	20	10	30
100%	17 - ES	0	0	0	0	0	0	0
100%	18 - R1	560	10	35	45	35	20	55
100%	19 - ES	0	0	0	0	0	0	0
100%	20 - MU	330	30	5	35	10	30	40
100%	21 - R1	330	5	20	25	20	15	35
100%	22 - R2	2,480	40	155	195	150	85	235
100%	23 - PO	0	0	0	0	0	0	0
100%	24 - PO	0	0	0	0	0	0	0
	TOTAL TRIPS:	**38,980**	**3,010**	**1,235**	**4,245**	**1,500**	**2,900**	**4,400**

(4)

Year 2025 Phase One & Phase Two Build-Out Total Trips by Area

Percent Complete	Area Number:	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
100%	1 - BP	8,920	900	170	1,070	225	745	970
0%	2 - ES	0	0	0	0	0	0	0
80%	3 - MU	3,750	390	100	490	120	380	500
0%	4 - R2	0	0	0	0	0	0	0
100%	5 - I	810	125	100	225	70	85	155
30%	6 - R1	410	10	25	35	25	15	40
0%	7 - PO	0	0	0	0	0	0	0
40%	8 - R1	360	5	20	25	20	10	30
0%	9 - ES	0	0	0	0	0	0	0
0%	10 - ES	0	0	0	0	0	0	0
60%	11 - BP	3,770	380	70	450	95	315	410
80%	12 - TOD	6,060	295	160	455	260	385	645
100%	13 - TS	1,350	225	35	260	55	185	240
0%	14 - ES	0	0	0	0	0	0	0
100%	15 - TOD	2,520	125	75	200	110	155	265
100%	16 - R2	380	5	25	30	20	10	30
0%	17 - ES	0	0	0	0	0	0	0
100%	18 - R1	560	10	35	45	35	20	55
0%	19 - ES	0	0	0	0	0	0	0
100%	20 - MU	330	30	5	35	10	30	40
100%	21 - R1	330	5	20	25	20	15	35
60%	22 - R2	1,490	25	95	120	90	50	140
0%	23 - PO	0	0	0	0	0	0	0
0%	24 - PO	0	0	0	0	0	0	0
	TOTAL TRIPS:	**31,040**	**2,530**	**935**	**3,465**	**1,155**	**2,400**	**3,555**

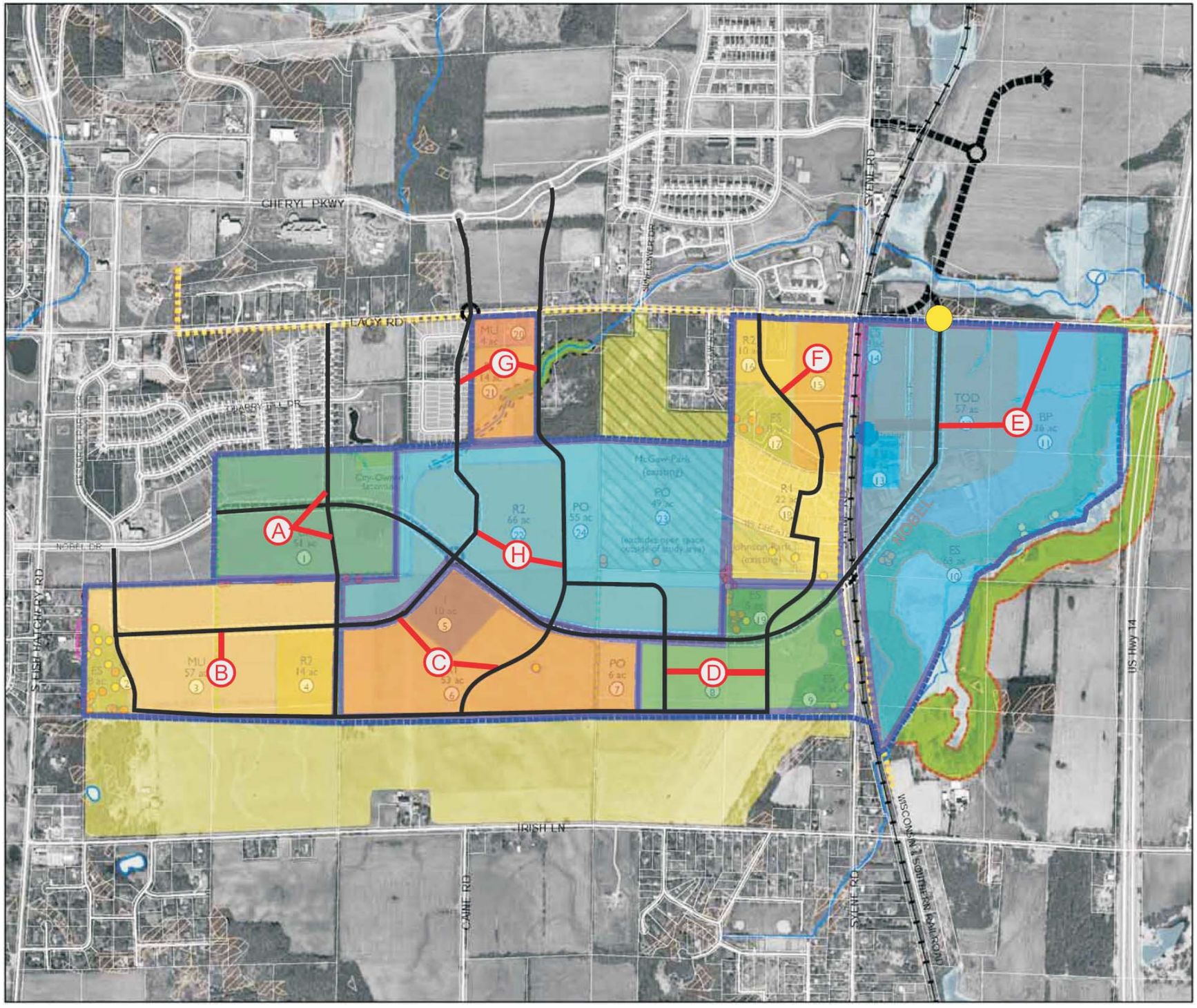
1. Full Build MPNP trip generation based on ITE rates and ITE Fitted Curve Equations (FCE)
2. FCEs converted to MPNP-specific equivalent trip rates
3. Trip Generation broken down by land use area for Year 2035 full build
4. Year 2025 Phase One & Phase Two total trips based on percent of full build that is complete
5. The total trips for each area are broken down to linked and new trips by TAZ in the next few exhibits.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3A
MPN TOTAL TRAFFIC TRIP GENERATION TABLES
FITCHBURG, WISCONSIN

NORTH
NOT TO SCALE



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3B
MPN TRAFFIC ANALYSIS ZONES (TAZ)
FITCHBURG, WISCONSIN

Year 2025 Trip Generation Table - TAZ A

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	788.7 x 1,000 SF	8,920 (11.31)	900 (84%)	170 (16%)	1,070 (1.36)	225 (23%)	745 (77%)	970 (1.23)
Total Trips			**8,920**	**900**	**170**	**1,070**	**225**	**745**	**970**
		Internally Linked:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ B:	*60*	*5*	*0*	*5*	*5*	*5*	*10*
		Linked to/from TAZ C:	*30*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ D:	*20*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ E:	*140*	*5*	*0*	*5*	*5*	*5*	*10*
		Linked to/from TAZ F:	*80*	*5*	*0*	*5*	*5*	*5*	*10*
		Linked to/from TAZ G:	*20*	*0*	*0*	*0*	*5*	*5*	*10*
		Linked to/from TAZ H:	*110*	*5*	*5*	*10*	*5*	*5*	*10*
Total Linked Trips (Minus)			**460**	**20**	**5**	**25**	**25**	**25**	**50**
Total New Trips			**8,460**	**880**	**165**	**1,045**	**200**	**720**	**920**

Year 2025 Trip Generation Table - TAZ B

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	352.6 x 1,000 SF	2,890 (8.19)	380 (88%)	50 (12%)	430 (1.23)	70 (17%)	355 (83%)	425 (1.21)
Apartments/Rental (R-2)	220	65 Units	410 (6.27)	5 (20%)	25 (80%)	30 (0.50)	25 (65%)	10 (35%)	35 (0.58)
Condominiums (R-2)	230	97 Units	450 (4.64)	5 (17%)	25 (83%)	30 (0.33)	25 (67%)	15 (33%)	40 (0.41)
Total Trips			**3,750**	**390**	**100**	**490**	**120**	**380**	**500**
		Linked to/from TAZ A:	*60*	*0*	*5*	*5*	*5*	*5*	*10*
		Internally Linked:	*40*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ C:	*20*	*0*	*0*	*0*	*0*	*5*	*5*
		Linked to/from TAZ D:	*10*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ E:	*120*	*5*	*5*	*10*	*5*	*5*	*10*
		Linked to/from TAZ F:	*40*	*5*	*0*	*5*	*0*	*5*	*5*
		Linked to/from TAZ G:	*10*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ H:	*40*	*5*	*0*	*5*	*0*	*5*	*5*
Total Linked Trips (Minus)			**340**	**15**	**10**	**25**	**10**	**25**	**35**
Total New Trips			**3,410**	**375**	**90**	**465**	**110**	**355**	**465**

Year 2025 Trip Generation Table - TAZ C

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Elementary School (I)	520	625 Students	810 (1.29)	125 (55%)	100 (45%)	225 (0.36)	70 (45%)	85 (55%)	155 (0.25)
Single-Family Housing (R-1)	210	22 Units	210 (9.57)	5 (25%)	10 (75%)	15 (0.75)	15 (63%)	5 (37%)	20 (1.01)
Townhomes (R-1)	230	34 Units	200 (5.57)	5 (17%)	15 (83%)	20 (0.42)	10 (67%)	10 (33%)	20 (0.50)
Total Trips			**1,220**	**135**	**125**	**260**	**95**	**100**	**195**
		Linked to/from TAZ A:	*30*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ B:	*20*	*0*	*0*	*0*	*5*	*0*	*5*
		Internally Linked:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ D:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ E:	*40*	*0*	*5*	*5*	*0*	*5*	*5*
		Linked to/from TAZ F:	*20*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ G:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ H:	*10*	*5*	*0*	*5*	*0*	*0*	*0*
Total Linked Trips (Minus)			**120**	**5**	**5**	**10**	**5**	**5**	**10**
Total New Trips			**1,100**	**130**	**120**	**250**	**90**	**95**	**185**

Year 2025 Trip Generation Table - TAZ D

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Single-Family Housing (R-1)	210	20 Units	190 (9.57)	5 (25%)	10 (75%)	15 (0.75)	15 (63%)	5 (37%)	20 (1.01)
Townhomes (R-1)	230	30 Units	170 (5.57)	0 (17%)	10 (83%)	10 (0.42)	5 (67%)	5 (33%)	10 (0.50)
Total Trips			**360**	**5**	**20**	**25**	**20**	**10**	**30**
		Linked to/from TAZ A:	*20*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ B:	*10*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ C:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Internally Linked:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ E:	*30*	*0*	*5*	*5*	*5*	*0*	*5*
		Linked to/from TAZ F:	*10*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ G:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Linked to/from TAZ H:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**70**	**0**	**5**	**5**	**5**	**0**	**5**
Total New Trips			**290**	**5**	**15**	**20**	**15**	**10**	**25**

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3C
MPN YEAR 2025 TRIP GENERATION TABLES PER TAZ
TAZ A THROUGH TAZ D
FITCHBURG, WISCONSIN

Year 2025 Trip Generation Table - TAZ E

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	334.0 x 1,000 SF	3,770 (11.31)	380 (84%)	70 (16%)	450 (1.36)	95 (23%)	315 (77%)	410 (1.23)
General Office	710	216.5 x 1,000 SF	1,780 (8.19)	235 (88%)	30 (12%)	265 (1.23)	45 (17%)	220 (83%)	265 (1.21)
Retail	820	55.7 x 1,000 SF	2,390 (42.94)	35 (61%)	20 (39%)	55 (1.03)	105 (48%)	110 (52%)	215 (3.75)
Apartments/Rental (R-2)	220	143 Units	900 (6.27)	15 (20%)	55 (80%)	70 (0.50)	50 (65%)	30 (35%)	80 (0.58)
Condominiums (R-2)	230	215 Units	990 (4.64)	10 (17%)	55 (83%)	65 (0.33)	60 (67%)	25 (33%)	85 (0.41)
Light Rail Transit Station	ITE Jrnl	384 Parking Spaces	1,350 (3.51)	225 (86%)	35 (14%)	260 (0.68)	55 (22%)	185 (78%)	240 (0.62)
Total Trips			**11,180**	**900**	**265**	**1,165**	**410**	**885**	**1,295**
Linked to/from TAZ A:			*140*	*0*	*5*	*5*	*5*	*5*	*10*
Linked to/from TAZ B:			*120*	*5*	*5*	*10*	*5*	*5*	*10*
Linked to/from TAZ C:			*40*	*5*	*0*	*5*	*5*	*0*	*5*
Linked to/from TAZ D:			*30*	*5*	*0*	*5*	*0*	*5*	*5*
Internally Linked:			*300*	*15*	*15*	*30*	*15*	*15*	*30*
Linked to/from TAZ F:			*110*	*5*	*5*	*10*	*5*	*10*	*15*
Linked to/from TAZ G:			*20*	*5*	*0*	*5*	*0*	*0*	*0*
Linked to/from TAZ H:			*120*	*5*	*0*	*5*	*5*	*10*	*15*
Total Linked Trips (Minus)			**880**	**45**	**30**	**75**	**40**	**50**	**90**
Total New Trips			**10,300**	**855**	**235**	**1,090**	**370**	**835**	**1,205**

Year 2025 Trip Generation Table - TAZ F

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	90.2 x 1,000 SF	740 (8.19)	100 (88%)	15 (12%)	115 (1.23)	20 (17%)	90 (83%)	110 (1.21)
Retail	820	23.2 x 1,000 SF	990 (42.94)	15 (61%)	10 (39%)	25 (1.03)	40 (48%)	45 (52%)	85 (3.75)
Single-Family Housing (R-1)	210	31 Units	300 (9.57)	5 (25%)	20 (75%)	25 (0.75)	20 (63%)	10 (37%)	30 (1.01)
Townhomes (R-1)	230	47 Units	260 (5.57)	5 (17%)	15 (83%)	20 (0.42)	15 (67%)	10 (33%)	25 (0.50)
Apartments/Rental (R-2)	220	88 Units	550 (6.27)	10 (20%)	35 (80%)	45 (0.50)	35 (65%)	15 (35%)	50 (0.58)
Condominiums (R-2)	230	132 Units	620 (4.64)	5 (17%)	40 (83%)	45 (0.33)	35 (67%)	15 (33%)	50 (0.41)
Total Trips			**3,460**	**140**	**135**	**275**	**165**	**185**	**350**
Linked to/from TAZ A:			*80*	*0*	*5*	*5*	*5*	*5*	*10*
Linked to/from TAZ B:			*40*	*0*	*5*	*5*	*5*	*0*	*5*
Linked to/from TAZ C:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ D:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*110*	*5*	*5*	*10*	*10*	*5*	*15*
Internally Linked:			*40*	*5*	*5*	*10*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**320**	**10**	**20**	**30**	**20**	**10**	**30**
Total New Trips			**3,140**	**130**	**115**	**245**	**145**	**175**	**320**

Year 2025 Trip Generation Table - TAZ G

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	30.9 x 1,000 SF	250 (8.19)	30 (88%)	0 (12%)	30 (1.23)	5 (17%)	30 (83%)	35 (1.21)
Single-Family Housing (R-1)	210	19 Units	180 (9.57)	5 (25%)	10 (75%)	15 (0.75)	15 (63%)	5 (37%)	20 (1.01)
Townhomes (R-1)	230	28 Units	150 (5.57)	0 (17%)	10 (83%)	10 (0.42)	5 (67%)	10 (33%)	15 (0.50)
Apartments/Rental (R-2)	220	6 Units	40 (6.27)	0 (20%)	5 (80%)	5 (0.50)	5 (65%)	0 (35%)	5 (0.58)
Condominiums (R-2)	230	9 Units	40 (4.64)	0 (17%)	0 (83%)	0 (0.33)	0 (67%)	0 (33%)	0 (0.41)
Total Trips			**660**	**35**	**25**	**60**	**30**	**45**	**75**
Linked to/from TAZ A:			*20*	*0*	*0*	*0*	*5*	*5*	*10*
Linked to/from TAZ B:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ C:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ D:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*20*	*0*	*5*	*5*	*0*	*0*	*0*
Linked to/from TAZ F:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**50**	**0**	**5**	**5**	**5**	**5**	**10**
Total New Trips			**610**	**35**	**20**	**55**	**25**	**40**	**65**

Year 2025 Trip Generation Table - TAZ H

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Apartments/Rental (R-2)	220	112 Units	700 (6.27)	10 (20%)	45 (80%)	55 (0.50)	40 (65%)	25 (35%)	65 (0.58)
Condominiums (R-2)	230	169 Units	790 (4.64)	15 (17%)	50 (83%)	65 (0.33)	50 (67%)	25 (33%)	75 (0.41)
Total Trips			**1,490**	**25**	**95**	**120**	**90**	**50**	**140**
Linked to/from TAZ A:			*110*	*5*	*5*	*10*	*5*	*5*	*10*
Linked to/from TAZ B:			*40*	*0*	*5*	*5*	*5*	*0*	*5*
Linked to/from TAZ C:			*10*	*0*	*5*	*5*	*0*	*0*	*0*
Linked to/from TAZ D:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*120*	*0*	*5*	*5*	*10*	*5*	*15*
Linked to/from TAZ F:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**300**	**5**	**20**	**25**	**20**	**10**	**30**
Total New Trips			**1,190**	**20**	**75**	**95**	**70**	**40**	**110**

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3D
MPN YEAR 2025 TRIP GENERATION TABLES PER TAZ
TAZ E THROUGH TAZ H
FITCHBURG, WISCONSIN

Year 2035 Trip Generation Table - TAZ A

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	788.7 x 1,000 SF	8,920 (11.31)	900 (84%)	170 (16%)	1,070 (1.36)	225 (23%)	745 (77%)	970 (1.23)
Total Trips			**8,920**	**900**	**170**	**1,070**	**225**	**745**	**970**
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ B:			*100*	*5*	*0*	*5*	*5*	*5*	*10*
Linked to/from TAZ C:			*90*	*5*	*5*	*10*	*5*	*5*	*10*
Linked to/from TAZ D:			*60*	*5*	*0*	*5*	*0*	*5*	*5*
Linked to/from TAZ E:			*150*	*10*	*0*	*10*	*5*	*10*	*15*
Linked to/from TAZ F:			*70*	*5*	*0*	*5*	*5*	*5*	*10*
Linked to/from TAZ G:			*20*	*5*	*0*	*5*	*5*	*0*	*5*
Linked to/from TAZ H:			*160*	*10*	*5*	*15*	*5*	*10*	*15*
Total Linked Trips (Minus)			**650**	**45**	**10**	**55**	**30**	**40**	**70**
Total New Trips			**8,270**	**855**	**160**	**1,015**	**195**	**705**	**900**

Year 2035 Trip Generation Table - TAZ B

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	440.7 x 1,000 SF	3,610 (8.19)	475 (88%)	65 (12%)	540 (1.23)	90 (17%)	445 (83%)	535 (1.21)
Apartments/Rental (R-2)	220	120 Units	750 (6.27)	10 (20%)	50 (80%)	60 (0.50)	45 (65%)	25 (35%)	70 (0.58)
Condominiums (R-2)	230	181 Units	840 (4.64)	15 (17%)	45 (83%)	60 (0.33)	50 (67%)	20 (33%)	70 (0.41)
Total Trips			**5,200**	**500**	**160**	**660**	**185**	**490**	**675**
Linked to/from TAZ A:			*100*	*0*	*5*	*5*	*5*	*5*	*10*
Internally Linked:			*80*	*10*	*10*	*20*	*5*	*5*	*10*
Linked to/from TAZ C:			*40*	*5*	*0*	*5*	*0*	*5*	*5*
Linked to/from TAZ D:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*210*	*5*	*10*	*15*	*15*	*10*	*25*
Linked to/from TAZ F:			*50*	*5*	*0*	*5*	*0*	*5*	*5*
Linked to/from TAZ G:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*60*	*5*	*0*	*5*	*5*	*5*	*10*
Total Linked Trips (Minus)			**570**	**30**	**25**	**55**	**30**	**35**	**65**
Total New Trips			**4,630**	**470**	**135**	**605**	**155**	**455**	**610**

Year 2035 Trip Generation Table - TAZ C

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Elementary School (I)	520	625 Students	810 (1.29)	125 (55%)	100 (45%)	225 (0.36)	70 (45%)	85 (55%)	155 (0.25)
Single-Family Housing (R-1)	210	75 Units	720 (9.57)	15 (25%)	40 (75%)	55 (0.75)	45 (63%)	30 (37%)	75 (1.01)
Townhomes (R-1)	230	113 Units	630 (5.57)	10 (17%)	40 (83%)	50 (0.42)	40 (67%)	15 (33%)	55 (0.50)
Total Trips			**2,160**	**150**	**180**	**330**	**155**	**130**	**285**
Linked to/from TAZ A:			*90*	*5*	*5*	*10*	*5*	*5*	*10*
Linked to/from TAZ B:			*40*	*0*	*5*	*5*	*5*	*0*	*5*
Internally Linked:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ D:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*130*	*0*	*5*	*5*	*5*	*5*	*10*
Linked to/from TAZ F:			*30*	*0*	*5*	*5*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**340**	**5**	**20**	**25**	**15**	**10**	**25**
Total New Trips			**1,820**	**145**	**160**	**305**	**140**	**120**	**260**

Year 2035 Trip Generation Table - TAZ D

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Single-Family Housing (R-1)	210	50 Units	480 (9.57)	10 (25%)	30 (75%)	40 (0.75)	30 (63%)	20 (37%)	50 (1.01)
Townhomes (R-1)	230	74 Units	410 (5.57)	5 (17%)	20 (83%)	25 (0.42)	25 (67%)	10 (33%)	35 (0.50)
Total Trips			**890**	**15**	**50**	**65**	**55**	**30**	**85**
Linked to/from TAZ A:			*60*	*0*	*5*	*5*	*5*	*0*	*5*
Linked to/from TAZ B:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ C:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*80*	*5*	*5*	*10*	*5*	*5*	*10*
Linked to/from TAZ F:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**180**	**5**	**10**	**15**	**10**	**5**	**15**
Total New Trips			**710**	**10**	**40**	**50**	**45**	**25**	**70**

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3E
MPN YEAR 2035 TRIP GENERATION TABLES PER TAZ
TAZ A THROUGH TAZ D
FITCHBURG, WISCONSIN

Year 2035 Trip Generation Table - TAZ E

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Business Park	770	556.7 x 1,000 SF	6,290 (11.31)	635 (84%)	120 (16%)	755 (1.36)	155 (23%)	525 (77%)	680 (1.23)
General Office	710	270.6 x 1,000 SF	2,220 (8.19)	295 (88%)	40 (12%)	335 (1.23)	55 (17%)	275 (83%)	330 (1.21)
Retail	820	69.6 x 1,000 SF	2,990 (42.94)	45 (61%)	25 (39%)	70 (1.03)	130 (48%)	135 (52%)	265 (3.75)
Apartments/Rental (R-2)	220	179 Units	1,120 (6.27)	20 (20%)	70 (80%)	90 (0.50)	70 (65%)	35 (35%)	105 (0.58)
Condominiums (R-2)	230	268 Units	1,240 (4.64)	10 (17%)	70 (83%)	80 (0.33)	70 (67%)	35 (33%)	105 (0.41)
Light Rail Transit Station	ITE Jrnl	384 Parking Spaces	1,350 (3.51)	225 (86%)	35 (14%)	260 (0.68)	55 (22%)	185 (78%)	240 (0.62)
Total Trips			**15,210**	**1,230**	**360**	**1,590**	**535**	**1,190**	**1,725**
Linked to/from TAZ A:			*150*	*0*	*10*	*10*	*10*	*5*	*15*
Linked to/from TAZ B:			*210*	*10*	*5*	*15*	*10*	*15*	*25*
Linked to/from TAZ C:			*130*	*5*	*0*	*5*	*5*	*5*	*10*
Linked to/from TAZ D:			*80*	*5*	*5*	*10*	*5*	*5*	*10*
Internally Linked:			*440*	*20*	*20*	*40*	*20*	*20*	*40*
Linked to/from TAZ F:			*130*	*10*	*0*	*10*	*5*	*10*	*15*
Linked to/from TAZ G:			*20*	*0*	*0*	*0*	*0*	*5*	*5*
Linked to/from TAZ H:			*230*	*15*	*5*	*20*	*5*	*15*	*20*
Total Linked Trips (Minus)			**1,390**	**65**	**45**	**110**	**60**	**80**	**140**
Total New Trips			**13,820**	**1,165**	**315**	**1,480**	**475**	**1,110**	**1,585**

Year 2035 Trip Generation Table - TAZ F

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	90.2 x 1,000 SF	740 (8.19)	100 (88%)	15 (12%)	115 (1.23)	20 (17%)	90 (83%)	110 (1.21)
Retail	820	23.2 x 1,000 SF	990 (42.94)	15 (61%)	10 (39%)	25 (1.03)	40 (48%)	45 (52%)	85 (3.75)
Single-Family Housing (R-1)	210	31 Units	300 (9.57)	5 (25%)	20 (75%)	25 (0.75)	20 (63%)	10 (37%)	30 (1.01)
Townhomes (R-1)	230	47 Units	260 (5.57)	5 (17%)	15 (83%)	20 (0.42)	15 (67%)	10 (33%)	25 (0.50)
Apartments/Rental (R-2)	220	88 Units	550 (6.27)	10 (20%)	35 (80%)	45 (0.50)	35 (65%)	15 (35%)	50 (0.58)
Condominiums (R-2)	230	132 Units	620 (4.64)	5 (17%)	40 (83%)	45 (0.33)	35 (67%)	15 (33%)	50 (0.41)
Total Trips			**3,460**	**140**	**135**	**275**	**165**	**185**	**350**
Linked to/from TAZ A:			*70*	*0*	*5*	*5*	*5*	*5*	*10*
Linked to/from TAZ B:			*50*	*0*	*5*	*5*	*5*	*0*	*5*
Linked to/from TAZ C:			*30*	*5*	*0*	*5*	*0*	*0*	*0*
Linked to/from TAZ D:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*130*	*0*	*10*	*10*	*10*	*5*	*15*
Internally Linked:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*30*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**340**	**5**	**20**	**25**	**20**	**10**	**30**
Total New Trips			**3,120**	**135**	**115**	**250**	**145**	**175**	**320**

Year 2035 Trip Generation Table - TAZ G

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
General Office	710	30.9 x 1,000 SF	250 (8.19)	30 (88%)	0 (12%)	30 (1.23)	5 (17%)	30 (83%)	35 (1.21)
Single-Family Housing (R-1)	210	19 Units	180 (9.57)	5 (25%)	10 (75%)	15 (0.75)	15 (63%)	5 (37%)	20 (1.01)
Townhomes (R-1)	230	28 Units	150 (5.57)	0 (17%)	10 (83%)	10 (0.42)	5 (67%)	10 (33%)	15 (0.50)
Apartments/Rental (R-2)	220	6 Units	40 (6.27)	0 (20%)	5 (80%)	5 (0.50)	5 (65%)	0 (35%)	5 (0.58)
Condominiums (R-2)	230	9 Units	40 (4.64)	0 (17%)	0 (83%)	0 (0.33)	0 (67%)	0 (33%)	0 (0.41)
Total Trips			**660**	**35**	**25**	**60**	**30**	**45**	**75**
Linked to/from TAZ A:			*20*	*0*	*5*	*5*	*0*	*5*	*5*
Linked to/from TAZ B:			*10*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ C:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ D:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*20*	*0*	*0*	*0*	*5*	*0*	*5*
Linked to/from TAZ F:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ H:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**50**	**0**	**5**	**5**	**5**	**5**	**10**
Total New Trips			**610**	**35**	**20**	**55**	**25**	**40**	**65**

Year 2035 Trip Generation Table - TAZ H

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total
Apartments/Rental (R-2)	220	188 Units	1,180 (6.27)	20 (20%)	75 (80%)	95 (0.50)	70 (65%)	40 (35%)	110 (0.58)
Condominiums (R-2)	230	281 Units	1,300 (4.64)	20 (17%)	80 (83%)	100 (0.33)	80 (67%)	45 (33%)	125 (0.41)
Total Trips			**2,480**	**40**	**155**	**195**	**150**	**85**	**235**
Linked to/from TAZ A:			*160*	*5*	*10*	*15*	*10*	*5*	*15*
Linked to/from TAZ B:			*60*	*0*	*5*	*5*	*5*	*5*	*10*
Linked to/from TAZ C:			*20*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ D:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ E:			*230*	*5*	*15*	*20*	*15*	*5*	*20*
Linked to/from TAZ F:			*30*	*0*	*0*	*0*	*0*	*0*	*0*
Linked to/from TAZ G:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Internally Linked:			*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Linked Trips (Minus)			**500**	**10**	**30**	**40**	**30**	**15**	**45**
Total New Trips			**1,980**	**30**	**125**	**155**	**120**	**70**	**190**

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-3F
MPN YEAR 2035 TRIP GENERATION TABLES PER TAZ
TAZ E THROUGH TAZ H
FITCHBURG, WISCONSIN

LEGEND:
XX% TAZ A, B, C, G & H TRIP DISTRIBUTION
(XX%) TAZ D, E & F TRIP DISTRIBUTION

IMPORTANT NOTE:

This trip distribution was determined by trial and error to reasonably fit MPO determined ADTs with the MPN build-out.

NORTH
NOT TO SCALE

20%
(5%)

FISH HATCHERY ROAD (CTH D)

RESEARCH PARK DRIVE

5%
(5%)

SYENE ROAD

USH 14 SB RAMPS

5%
(20%)

10%
(10%)

USH 14 NB RAMPS

EAST CHERYL PARKWAY

CHERYL DRIVE

JONES FARM DRIVE

INTERCHANGE ROAD

10%
(10%)

LACY ROAD

LACY ROAD

5%
(10%)

MICA ROAD

FAHEY GLEN

NOTRE DAME

NOBEL DRIVE

"MIXED USE ROAD"

Trips Linked to Bordering Growth Areas and Multi-Modal Trips Combined:

20%
(20%)

5%
(5%)

IRISH LANE

15%
(5%)

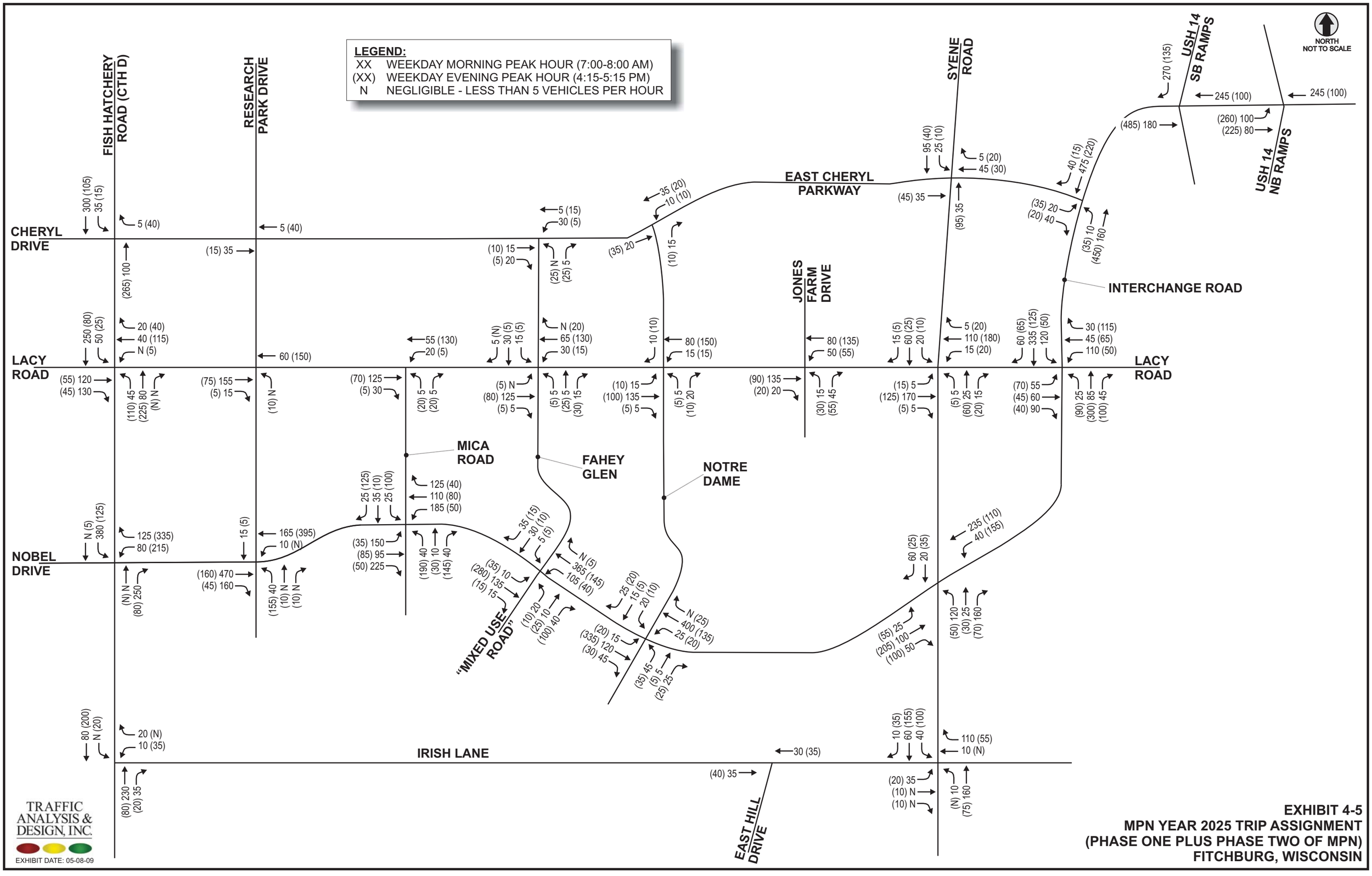
EAST HILL DRIVE

5%
(10%)

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

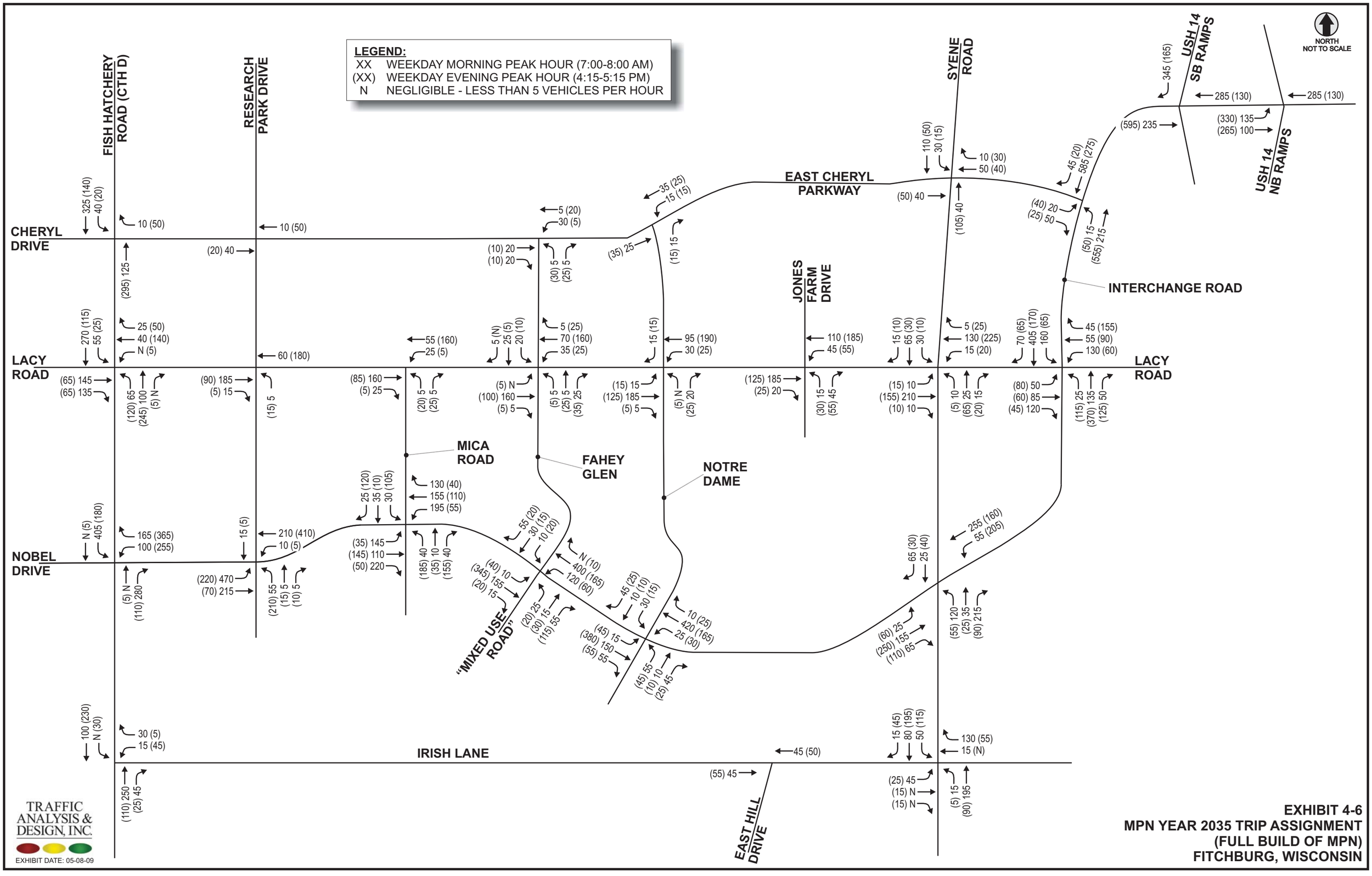
EXHIBIT 4-4
MPN ANTICIPATED TRIP DISTRIBUTIONS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

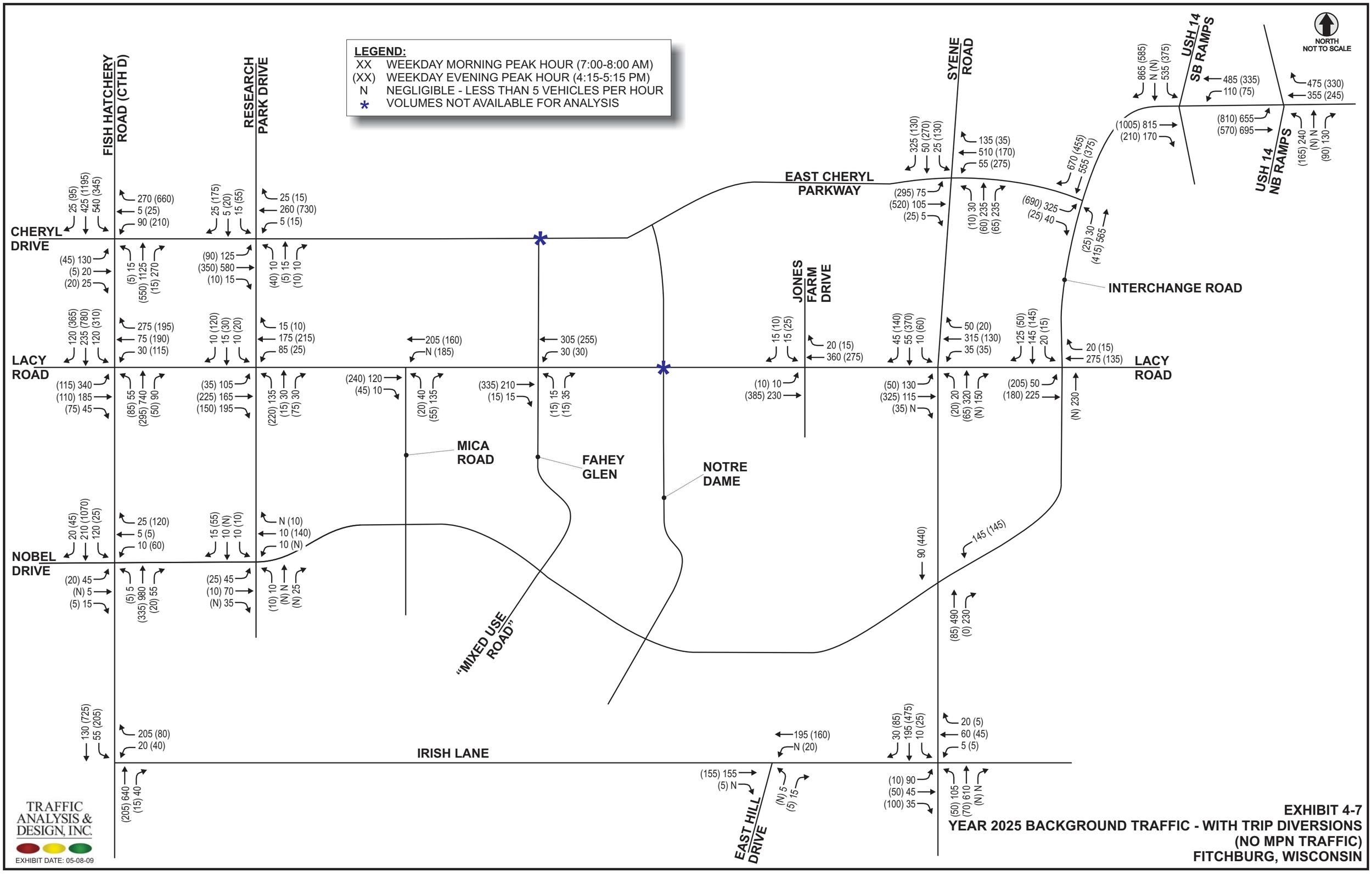
EXHIBIT 4-5
MPN YEAR 2025 TRIP ASSIGNMENT
(PHASE ONE PLUS PHASE TWO OF MPN)
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

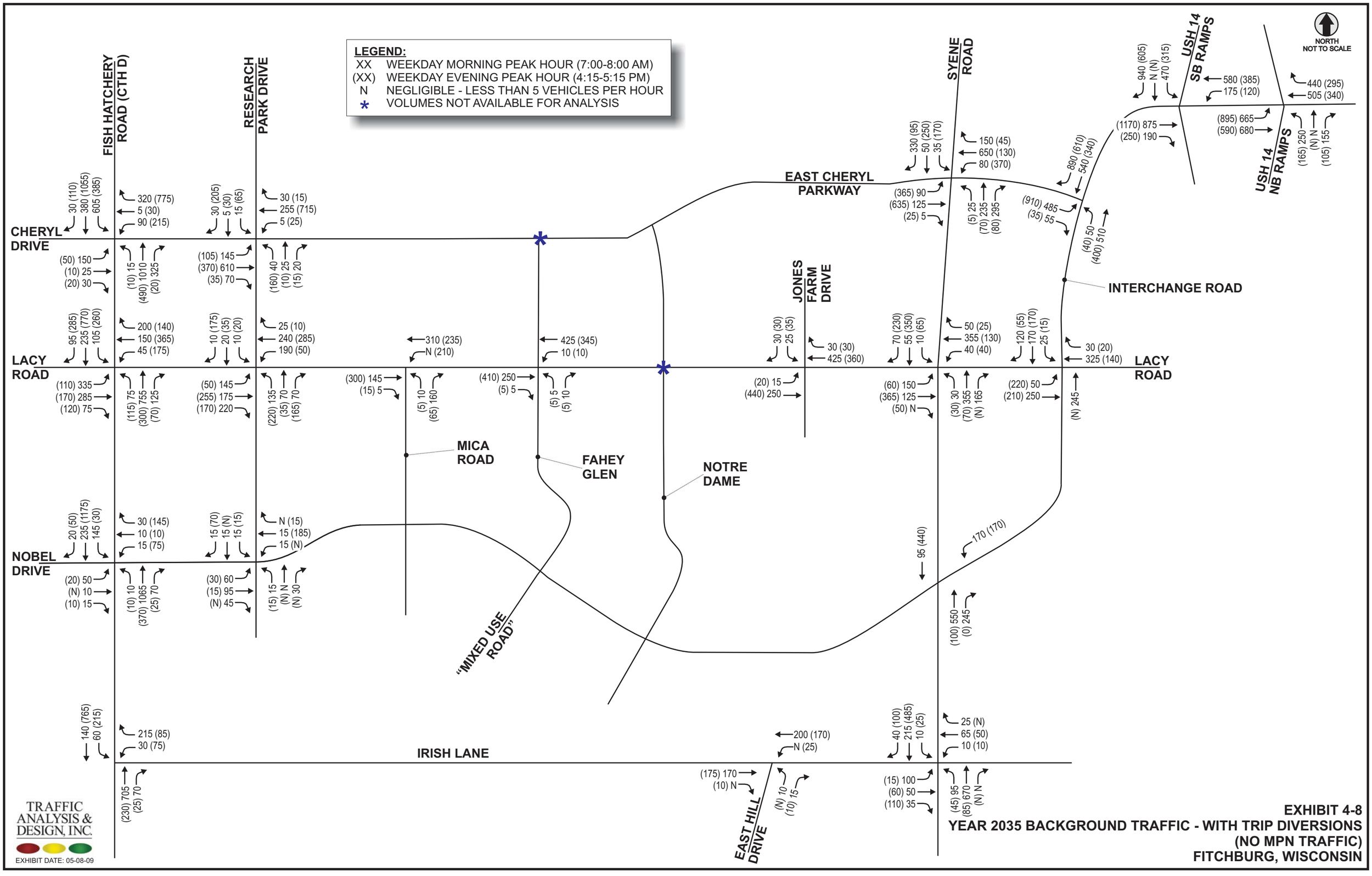
EXHIBIT 4-6
MPN YEAR 2035 TRIP ASSIGNMENT
(FULL BUILD OF MPN)
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

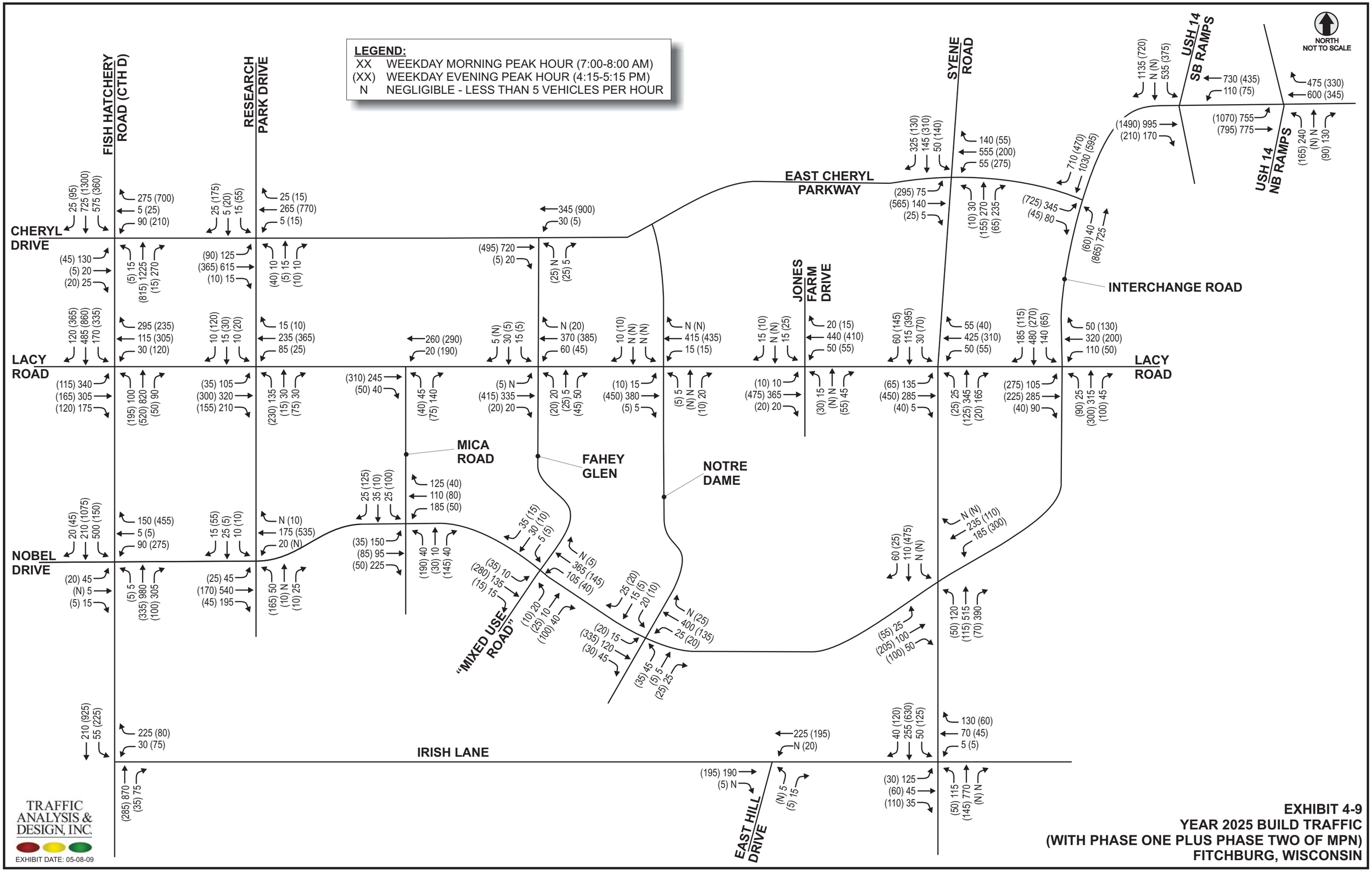
EXHIBIT 4-7
YEAR 2025 BACKGROUND TRAFFIC - WITH TRIP DIVERSIONS (NO MPN TRAFFIC)
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-8
YEAR 2035 BACKGROUND TRAFFIC - WITH TRIP DIVERSIONS (NO MPN TRAFFIC)
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-9
YEAR 2025 BUILD TRAFFIC
(WITH PHASE ONE PLUS PHASE TWO OF MPN)
FITCHBURG, WISCONSIN

LEGEND:
XX WEEKDAY MORNING PEAK HOUR (7:00-8:00 AM)
(XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR

NORTH
NOT TO SCALE

CHERYL DRIVE
LACY ROAD
NOBEL DRIVE
IRISH LANE
EAST CHERYL PARKWAY
INTERCHANGE ROAD
FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
JONES FARM DRIVE
SYENE ROAD
USH 14 SB RAMPS
USH 14 NB RAMPS
MICA ROAD
FAHEY GLEN
NOTRE DAME
"MIXED USE ROAD"
EAST HILL DRIVE

TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09

EXHIBIT 4-10
YEAR 2035 BUILD TRAFFIC
(WITH FULL BUILD OF MPN)
FITCHBURG, WISCONSIN

Average Daily Traffic Forecasts

Location	Existing	(No MPN) 2025 Back'd	(No MPN) 2035 Back'd	(With MPN) 2025 Build	(With MPN) 2035 Build
Fish Hatchery, North of East Cheryl	*unk.*	24,750	24,270	25,970	28,410
Fish Hatchery, North of Lacy	12,900[A]	18,540	17,040	18,090	19,590
Fish Hatchery, South of Lacy	10,000[A]	12,380	13,400	15,050	17,930
Fish Hatchery, South of Nobel	9,160[B]	12,990	14,180	13,360	15,250
Research Park, North of Lacy	*unk.*	1,780	2,640	1,800	1,960
Research Park, South of Lacy	*unk.*	3,470	3,960	3,110	3,580
Research Park, North of Nobel	*unk.*	610	780	640	1,020
Research Park, South of Nobel	*unk.*	*unk.*	*unk.*	1,510	3,240
Mica, South of Lacy	510[A]	2,200	2,090	5,000	4,430
Mica, North of Nobel				2,280	2,650
Mica, South of Nobel				2,420	2,660
Fahey Glen, South of East Cheryl		*unk.*	*unk.*	4,740	6,250
Fahey Glen, North of Lacy		*unk.*	*unk.*	4,650	5,300
Fahey Glen, South of Lacy	*unk.*	470	150	1,960	2,260
Fahey Glen, North of Nobel				1,250	1,970
Fahey Glen, South of Nobel				890	1,990
Notre Dame, South of East Cheryl		*unk.*	*unk.*	2,170	2,680
Notre Dame, North of Lacy		*unk.*	*unk.*	2,170	2,660
Notre Dame, South of Lacy	*unk.*	*unk.*	*unk.*	310	330
Notre Dame, North of Nobel				160	350
Notre Dame, South of Nobel				750	870
Syene, North of Cheryl	5,480[A]	7,870	8,380	8,850	9,860
Syene, North of Lacy	4,900[B]	7,110	8,100	6,770	7,920
Syene, South of Lacy	2,340[C]	7,770	8,430	3,510	4,610
Syene, North of Irish	*unk.*	7,660	8,330	9,780	10,450
Interchange Rd, North of Lacy		3,920	4,190	6,990	7,700
Interchange Rd, South of East Cheryl		8,840	9,270	9,840	10,300
Interchange Rd, West of USH 14		21,330	25,950	23,560	26,840
East Cheryl, East of Fish Hatchery	4,940[B]	11,380	12,950	11,470	12,910
East Cheryl, between Fahey Glen & Notre Dame	3,130[D]	9,990	11,240	10,090	11,350
East Cheryl, West of Syene	*unk.*	10,580	12,210	12,160	13,310
East Cheryl, East of Syene		12,840	15,750	12,990	15,150
Lacy, East of Fish Hatchery	*3550*[A]	8,210	10,100	8,340	8,900
Lacy, between Fahey Glen & Notre Dame	4,780[B]	5,880	7,410	8,690	10,140
Lacy, West of Syene	4,180[E]	6,370	7,930	7,390	8,390
Lacy, between Syene & Nobel	2,530[B]	7,640	8,690	5,980	8,070
Lacy, West of USH 14	2,530[B]	3,200	3,970	4,430	6,730
Nobel, East of Fish Hatchery	*unk.*	610	780	5,930	8,420
Nobel, West of Mica				4,000	4,810
Nobel, between Fahey Glen & Notre Dame				1,610	3,190
Nobel, West of Syene				2,590	4,530
Nobel, East of Syene				6,710	7,960
Nobel, South of Lacy				7,510	8,230
Irish, East of Fish Hatchery	1,200[F]	5,210	5,840	4,670	5,460
Irish, West of Syene	*unk.*	1,340	1,310	1,920	2,660

Notes: "Unk" is an unknown value; Blacked out values indicate a roadway section is not built.
"A" = 2005 Count; "B" = 2007 Count; "C" = 2006 Count; "D" = 2004 Count; "E" = 2008 Count; "F" = 2002 Count
Existing values provided by City of Fitchburg; Future volume forecast estimates provided by MPO.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 4-11
AVERAGE DAILY TRAFFIC FORECASTS
FITCHBURG, WISCONSIN

CHAPTER V – TRAFFIC AND IMPROVEMENT ANALYSIS

PART A – SITE ACCESS

A1. Proposed Access Points & Roadways

Several new access points and roadways are proposed throughout the MPN. Reference Chapter II, Part A, Section A3 for a description of the access points and roadways.

A2. Alternative Modes of Transportation

Pedestrian and bicycle facilities are recommended throughout the MPN as a means to reduce motorized vehicle traffic, provide alternative means of transportation, and provide for recreation. In addition, strong consideration is being given to expanding transit service in the area. Reference Chapter II, Part D, Section D2 for further discussion of these alternative modes of transportation.

PART B – CAPACITY ANALYSIS – NO IMPROVEMENTS

A capacity analysis was conducted at each of the study area intersections under Year 2025 and Year 2035 background traffic volumes (no MPN) and Year 2025 and Year 2035 build traffic volumes (with MPN). The analysis was conducted using existing traffic signal sequencing and lane geometrics anticipated after all known reconstruction projects are complete.

This TIA investigates operations sixteen and twenty-six years into the future and has been done as a planning study rather than for specifically-known development end users. The years shown are approximate for the purpose of the traffic analysis. With growth in the area it is anticipated that peak hour smoothing will begin to occur and that peak hour factors and heavy vehicle percentages will change to reflect the growth. A peak hour factor equal to 0.90 and a heavy vehicle percentage equal to 5-percent have been utilized at all the study area intersections for the future year analyses.

The following exhibits summarize operations without further improvements:

- Exhibit 5-1: Year 2025 background traffic operating conditions.
- Exhibit 5-2: Year 2035 background traffic operating conditions.
- Exhibit 5-3: Year 2025 build traffic operating conditions.
- Exhibit 5-4: Year 2035 build traffic operating conditions.

As shown in these exhibits, several intersections are expected to operate with movements at LOS E/F conditions.

PART C – CAPACITY ANALYSIS – WITH IMPROVEMENTS

C1. Year 2008 Existing Traffic Operating Conditions – *With Improvements*

Year 2008 existing traffic (no MPN) recommended improvements are outlined in detail in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-5, all movements at the study area intersections are expected to operate at LOS D or better conditions in the Year 2008 without the MPN and with the identified improvements.

C2. Year 2025 Background Traffic Operating Conditions – *With Improvements*

Year 2025 background traffic (no MPN) recommended improvements are outlined in detail in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-6, all movements at the study area intersections are expected to operate at LOS D or better conditions in the Year 2025 without the MPN and with the identified improvements.

C3. Year 2035 Background Traffic Operating Conditions – *With Improvements*

Year 2035 background traffic (no MPN) recommended improvements are outlined in detail in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-7, the eastbound left-turn/through movement on Nobel Drive at Fish Hatchery Road may operate at LOS E/F conditions during the weekday peak hours. Volumes are not high enough to consider traffic signals. No additional improvements are recommended at this intersection under Year 2035 background traffic volumes beyond those outlined in Chapter VI.

All other movements at the study area intersections are expected to operate at LOS D or better conditions in the Year 2035 without the MPN and with the identified improvements.

C4. Year 2025 Build Traffic Operating Conditions – *With Improvements*

Year 2025 build traffic (with phase one plus phase two MPN) recommended improvements are outlined in detail in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-8, all movements at the study area intersections are expected to operate at LOS D or better conditions in the Year 2025 with the phase one plus phase two completion of the MPN and with the identified improvements.

C5. Year 2035 Build Traffic Operating Conditions – *With Improvements*

Year 2035 build traffic (with full build-out of MPN) recommended improvements are outlined in detail in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-9, all movements at the study area intersections are expected to operate at LOS D or better conditions in the Year 2035 with the full build completion of MPN and with the identified improvements.

PART D – QUEUEING ANALYSIS

To estimate storage length requirements for turn bays at the study area intersections with improvements, a queuing analysis has been conducted. Note that the 50th percentile and 95 percentile probable queue lengths were used for the design of turn bays at traffic signal and stop sign controlled intersections. These queues were obtained from SYNCHRO computer software output. Two times the average queue under the 50 percentile confidence level, divided by the number of approach lanes, was used for the design of roundabout controlled approaches. Roundabout queues were obtained from RODEL computer software output. The following is a list of where the results of the queuing analysis can be found:

- Year 2008 Existing Traffic, With Improvements – Exhibit 5-10
- Year 2025 Background Traffic, With Improvements – Exhibit 5-11
- Year 2035 Background Traffic, With Improvements – Exhibit 5-12
- Year 2025 Build Traffic, With Improvements – Exhibit 5-13
- Year 2035 Build Traffic, With Improvements – Exhibit 5-14

PART E – PEDESTRIAN, BICYCLE AND MULTI-USE TRAIL CONSIDERATIONS

As previously mentioned, pedestrian and bicycle facilities are recommended throughout the MPN as a means to reduce motorized vehicle traffic, provide alternative means of transportation, and provide for recreation. Reference Chapter II, Part D, Section D2 for further discussion of these alternative modes of transportation.

PART F – SPEED CONSIDERATIONS/SIGHT DISTANCE

All new or improved intersections throughout the study area should be designed for intersection sight distance (ISD) in accordance with the latest edition of the American Association of State Highway Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*. Any WisDOT controlled intersections in the study area, such as the proposed Interchange Road interchange with USH 14, should be designed for ISD in accordance with the latest Facilities Development Manual (FDM) design guidelines (Procedure 11-10-5). *The party responsible for designing the intersections is responsible for cross-checking, verifying and designing for all sight distances.*

Year 2025 Background Traffic Peak Hour Operating Conditions
Anticipated Geometrics, After All Known Reconstruction Plans

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	D	D	C	C	C	B	**E**	**E**	**F**	A	A
		PM	C	C	C	D	D	**F**	B	B	B	D	B	B
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	**E**	**E**	**E**	**E**	**E**	**E**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
East Cheryl Parkway & Syene Road	Two-Way Stop	AM	**F**	**F**	A	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	B	**F**	**F**	**F**	A	A	A	A	A	A
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			A		
		PM	A			-			A			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	C	B	A	A	-	-	-	-	**E**	**E**	C
		PM	-	B	B	A	A	-	-	-	-	D	D	C
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	A	-	-	C	C	D	D	C	-	-	-
		PM	B	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	**F**	B	B	C	**F**	**F**	C	D	C	C	B	B
		PM	C	C	C	C	**F**	**F**	**F**	C	C	B	C	C
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	C	C	C
		PM	A	A	A	A	A	A	**F**	**F**	**F**	C	C	C
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	B	-	B
		PM	A	A	-	-	A	A	-	-	-	C	-	C
Lacy Road & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
Lacy Road & Interchange Road	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	D	-	B
		PM	A	A	-	-	A	A	-	-	-	C	-	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	**F**	**F**	A	D	D	C	A	A	A	B	A	A
		PM	D	D	C	**E**	**E**	B	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	A	A	A
		PM	A	A	A	A	A	A	B	A	A	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	D	-	A	A	A	A	-
		PM	-	-	-	**F**	-	B	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	A	-	A	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	D	D	D	D	D	D	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-1
YEAR 2025 BACKGROUND TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *NO IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2035 Background Traffic Peak Hour Operating Conditions
Anticipated Geometrics, After All Known Reconstruction Plans

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	D	D	C	C	C	B	D	D	**F**	A	A
		PM	C	C	C	D	D	**F**	B	B	B	**E**	B	B
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
East Cheryl Parkway & Syene Road	Two-Way Stop	AM	**F**	**F**	A	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	B	**F**	**F**	**F**	A	A	A	A	A	A
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			A		
		PM	A			-			B			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	C	B	B	A	-	-	-	-	D	D	D
		PM	-	B	B	A	A	-	-	-	-	D	D	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	A	-	-	C	C	D	D	C	-	-	-
		PM	B	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	**F**	C	C	C	**F**	**F**	C	D	C	B	B	B
		PM	C	C	C	**E**	**F**	**F**	**F**	C	C	B	C	C
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**E**	**E**	**E**
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	C	-	C
		PM	A	A	-	-	A	A	-	-	-	C	-	C
Lacy Road & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
Lacy Road & Interchange Road	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	**E**	-	C
		PM	A	A	-	-	A	A	-	-	-	C	-	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	**F**	**F**	B	D	D	D	A	A	A	C	A	A
		PM	**E**	**E**	D	**F**	**F**	B	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	B	B	B
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	D	-	**E**	-	A	A	B	A	-
		PM	-	-	-	**F**	-	B	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**E**	**E**	**E**	**E**	**E**	**E**	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-2
YEAR 2035 BACKGROUND TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *NO IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2025 Build Traffic Peak Hour Operating Conditions
Anticipated Geometrics, After All Known Reconstruction Plans

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	D	D	C	C	C	B	E	E	F	A	A
		PM	C	C	C	D	D	E	B	C	C	F	B	B
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	E	E	E	D	D	D
		PM	A	A	A	A	A	A	F	F	F	F	F	F
East Cheryl Parkway & Fahey Glen Extended	Roundabt	AM	A			A			A			-		
		PM	A			B			A			-		
East Cheryl Parkway & Syene Road	Two-Way Stop	AM	F	F	A	F	F	F	A	A	A	A	A	A
		PM	F	F	B	F	F	F	A	A	A	A	A	A
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			B			C		
		PM	A			-			F			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	B	B	A	A	-	-	-	-	F	F	F
		PM	-	B	B	B	A	-	-	-	-	F	F	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	B	-	-	C	C	D	D	C	-	-	-
		PM	B	B	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	E	E	C	C	F	F	C	E	C	C	B	B
		PM	C	C	C	D	F	F	F	C	C	C	C	C
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	F	F	F	D	D	D
		PM	A	A	A	A	A	A	F	F	F	C	C	C
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	C	-	C	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	B	B	B
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	C	C	C	D	D	D
Lacy Road & Syene Road	Two-Way Stop	AM	F	F	F	F	F	F	A	A	A	A	A	A
		PM	F	F	F	F	F	F	A	A	A	A	A	A
Lacy Road & Interchange Road/Nobel Drive	Two-Way Stop	AM	A	A	A	A	A	A	F	F	F	F	F	B
		PM	A	A	A	A	A	A	F	F	F	F	F	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	F	F	A	F	F	E	A	A	A	F	A	A
		PM	F	F	C	F	F	D	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	D	D	D	B	B	B
Nobel Drive & Mica Road	Two-Way Stop	AM	A	A	A	A	A	A	F	F	F	F	F	F
		PM	A	A	A	A	A	A	E	E	E	C	C	C
Nobel Drive & Fahey Glen	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Nobel Drive & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	C	C	C	B	B	B
Nobel Drive & Syene Road	Two-Way Stop	AM	F	F	F	F	F	F	A	A	A	A	A	A
		PM	F	F	F	F	F	F	A	A	A	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	E	-	F	-	A	A	B	A	-
		PM	-	-	-	F	-	B	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	F	F	F	F	F	F	A	A	A	A	A	A
		PM	F	F	F	F	F	F	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-3
YEAR 2025 BUILD TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *NO IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2035 Build Traffic Peak Hour Operating Conditions
Anticipated Geometrics, After All Known Reconstruction Plans

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	D	D	C	C	C	B	**E**	**E**	**F**	A	A
		PM	C	C	C	D	D	**F**	B	C	C	**F**	B	B
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
East Cheryl Parkway & Fahey Glen Extended	Roundabt	AM	A			A			A			-		
		PM	A			B			A			-		
East Cheryl Parkway & Syene Road	Two-Way Stop	AM	**F**	**F**	A	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	B	**F**	**F**	**F**	A	A	A	A	A	A
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			D			**F**		
		PM	A			-			**F**			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	B	B	B	A	-	-	-	-	**F**	**F**	**F**
		PM	-	C	B	B	A	-	-	-	-	D	D	**E**
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	B	-	-	D	C	D	D	C	-	-	-
		PM	C	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	**E**	D	D	D	**F**	**F**	D	**E**	C	C	B	B
		PM	C	C	C	**F**	**F**	**F**	**F**	C	C	C	C	C
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	B	A	A	**F**	**F**	**F**	**F**	**F**	**F**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	C	-	C	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	D	D	D
		PM	A	A	A	A	A	A	**E**	**E**	**E**	**F**	**F**	**F**
Lacy Road & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
Lacy Road & Interchange Road/Nobel Drive	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	B
		PM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	**F**	**F**	A	**F**	**F**	**F**	A	A	A	**F**	A	A
		PM	**F**	**F**	D	**F**	**F**	**E**	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	B	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	**F**	**F**	**F**	C	C	C
Nobel Drive & Mica Road	Two-Way Stop	AM	A	A	A	A	A	A	**F**	**F**	**F**	**F**	**F**	**F**
		PM	A	A	A	A	A	A	**F**	**F**	**F**	D	D	D
Nobel Drive & Fahey Glen	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Nobel Drive & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Nobel Drive & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	**F**	-	**F**	-	A	A	B	A	-
		PM	-	-	-	**F**	-	B	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A
		PM	**F**	**F**	**F**	**F**	**F**	**F**	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-4
YEAR 2035 BUILD TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *NO IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2008 Existing Traffic Peak Hour Operating Conditions
With Recommended Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	C	C	C	C	C	C	B	C	C	D	A	A
		PM	B	B	B	B	B	C	B	B	B	A	A	A
East Cheryl Parkway & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	B	B	B	C	D	D	C	C	B	B	B	B
		PM	B	B	B	C	D	D	C	C	C	B	B	B
Lacy Road & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	D	D	D	B	B	B
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Syene Road	Two-Way Stop	AM	D	D	D	B	B	B	A	A	A	A	A	A
		PM	D	D	D	B	B	B	A	A	A	A	A	A
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	C	C	A	C	C	C	A	A	A	B	A	A
		PM	C	C	B	C	C	B	A	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	A	A	A
		PM	A	A	A	A	A	A	A	A	A	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	C	-	A	A	A	A	-
		PM	-	-	-	D	-	A	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	A	-	A	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Two-Way Stop	AM	B	B	B	B	B	B	A	A	A	A	A	A
		PM	B	B	B	B	B	B	A	A	A	A	A	A

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-5
YEAR 2008 EXISTING TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *WITH IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2025 Background Traffic Peak Hour Operating Conditions
With Recommended Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	C	C	D	C	B	D	C	B	D	A	A
		PM	C	C	C	D	C	C	C	C	B	D	B	A
East Cheryl Parkway & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
East Cheryl Parkway & Syene Road	Roundabt	AM	A			A			A			A		
		PM	A			A			A			B		
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			A		
		PM	A			-			A			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	B	B	A	A	-	-	-	-	C	C	D
		PM	-	B	B	A	A	-	-	-	-	C	C	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	A	-	-	C	C	D	D	C	-	-	-
		PM	B	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	D	C	C	C	D	D	B	C	B	C	B	B
		PM	C	C	C	D	D	C	B	C	B	A	B	B
Lacy Road & Research Park Drive	All-Way Stop	AM	C	C	A	A	B	B	B	B	B	A	A	A
		PM	C	C	B	B	C	C	C	C	C	B	B	B
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	B	-	B
		PM	A	A	-	-	A	A	-	-	-	C	-	C
Lacy Road & Syene Road	Traffic Signal	AM	B	A	A	B	B	B	B	B	B	B	B	B
		PM	B	B	B	B	B	B	B	B	B	B	C	B
Lacy Road & Interchange Road	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	D	-	B
		PM	A	A	-	-	A	A	-	-	-	C	-	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	D	D	A	D	D	B	A	A	A	B	A	A
		PM	D	D	B	C	C	B	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	A	A	A
		PM	A	A	A	A	A	A	B	B	B	A	A	A
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	C	-	A	A	B	A	-
		PM	-	-	-	C	-	A	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	A	-	A	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Roundabt	AM	A			A			B			A		
		PM	A			A			A			A		

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-6
YEAR 2025 BACKGROUND TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *WITH IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2035 Background Traffic Peak Hour Operating Conditions
With Recommended Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	C	C	C	C	B	D	C	B	D	A	A
		PM	C	C	C	D	C	C	C	B	B	D	B	A
East Cheryl Parkway & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
East Cheryl Parkway & Syene Road	Roundabt	AM	A			A			A			A		
		PM	B			A			A			B		
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			A		
		PM	A			-			B			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	C	B	B	A	-	-	-	-	C	C	D
		PM	-	B	B	A	A	-	-	-	-	C	C	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	A	-	-	C	C	D	D	C	-	-	-
		PM	B	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	D	C	C	C	D	D	B	C	B	C	B	B
		PM	C	B	B	C	D	C	C	C	C	B	C	C
Lacy Road & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	C	-	C
		PM	A	A	-	-	A	A	-	-	-	C	-	C
Lacy Road & Syene Road	Traffic Signal	AM	B	B	B	B	B	C	B	C	B	B	B	B
		PM	B	C	C	B	B	B	B	B	B	B	C	B
Lacy Road & Interchange Road	Two-Way Stop	AM	A	A	-	-	A	A	-	-	-	C	-	C
		PM	A	A	-	-	A	A	-	-	-	C	-	B
Fish Hatchery Road & Nobel Drive	Two-Way Stop	AM	**F**	**F**	A	D	D	B	A	A	A	C	A	A
		PM	**E**	**E**	C	D	D	B	B	A	A	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	A	A	A	B	B	B
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	C	-	A	A	B	A	-
		PM	-	-	-	D	-	A	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Roundabt	AM	A			A			B			A		
		PM	A			A			A			A		

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-7
YEAR 2035 BACKGROUND TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *WITH IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2025 Build Traffic Peak Hour Operating Conditions
With Recommended Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	C	C	D	C	B	D	C	B	D	A	A
		PM	C	C	C	D	C	C	C	C	B	D	B	A
East Cheryl Parkway & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
East Cheryl Parkway & Fahey Glen Extended	Roundabt	AM	A			A			A			-		
		PM	A			B			A			-		
East Cheryl Parkway & Syene Road	Roundabt	AM	A			A			A			B		
		PM	A			A			A			A		
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			A		
		PM	A			-			A			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	C	B	A	A	-	-	-	-	C	C	D
		PM	-	B	B	A	A	-	-	-	-	C	C	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	B	A	-	-	C	C	D	D	C	-	-	-
		PM	B	A	-	-	C	C	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	C	C	B	C	D	D	A	A	A	C	B	B
		PM	C	C	B	C	D	C	C	C	C	C	C	B
Lacy Road & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	C	-	C	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	B	B	B
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	C	C	C	D	D	D
Lacy Road & Syene Road	Traffic Signal	AM	B	A	A	A	B	B	B	B	B	B	B	B
		PM	A	B	B	A	B	B	B	B	B	B	C	B
Lacy Road & Interchange Road/Nobel Drive	Roundabt	AM	B			A			A			B		
		PM	A			A			A			A		
Fish Hatchery Road & Nobel Drive	Traffic Signal	AM	D	D	C	D	D	D	B	C	C	D	A	A
		PM	C	C	C	D	D	C	B	B	B	A	A	A
Nobel Drive & Research Park Drive	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	D	D	D	B	B	B
Nobel Drive & Mica Road	Two-Way Stop	AM	A	A	A	A	A	A	D	D	A	D	D	A
		PM	A	A	A	A	A	A	C	C	A	C	C	A
Nobel Drive & Fahey Glen	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Nobel Drive & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Nobel Drive & Syene Road	Traffic Signal	AM	C	C	C	B	B	B	B	B	B	A	B	B
		PM	C	C	C	B	B	B	B	B	B	B	C	C
Fish Hatchery Road & Irish Lane	Two-Way Stop	AM	-	-	-	C	-	C	-	A	A	B	A	-
		PM	-	-	-	D	-	A	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	A	-	A	-	-	-
Irish Lane & Syene Road	Roundabt	AM	A			A			C			A		
		PM	A			A			A			B		

Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-8
YEAR 2025 BUILD TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *WITH IMPROVEMENTS*
FITCHBURG, WISCONSIN

Year 2035 Build Traffic Peak Hour Operating Conditions
With Recommended Improvements

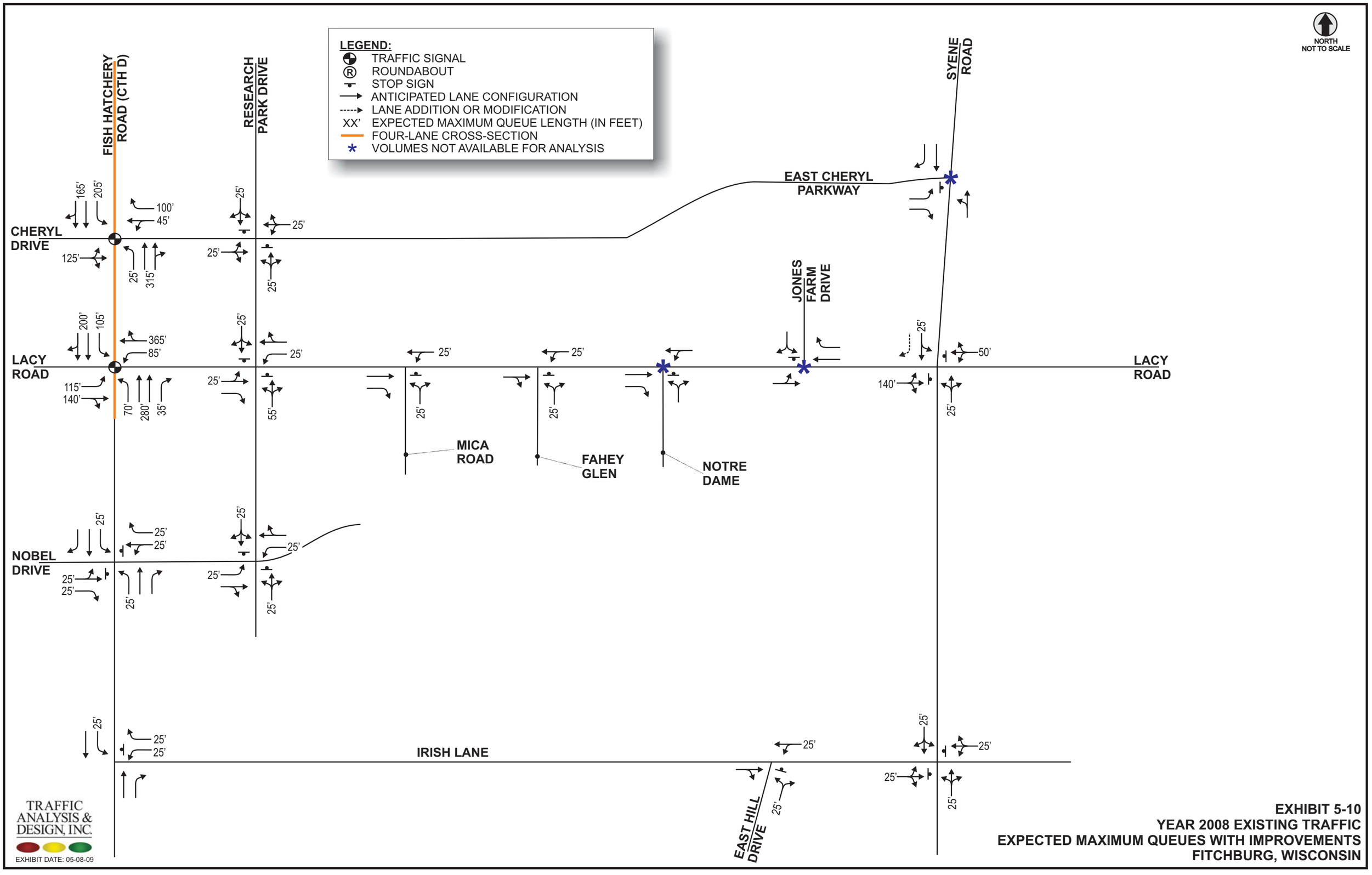
Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Fish Hatchery Road & East Cheryl Parkway	Traffic Signal	AM	D	C	C	C	C	B	D	C	B	D	A	A
		PM	C	C	C	D	C	C	C	C	B	D	B	A
East Cheryl Parkway & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
East Cheryl Parkway & Fahey Glen Extended	Roundabt	AM	A			A			A			-		
		PM	A			B			A			-		
East Cheryl Parkway & Syene Road	Roundabt	AM	A			A			A			A		
		PM	C			A			B			A		
Interchange Road & East Cheryl Parkway	Roundabt	AM	A			-			A			B		
		PM	A			-			B			A		
Interchange Road & USH 14 SB Ramps	Traffic Signal	AM	-	B	B	B	B	-	-	-	-	D	D	D
		PM	-	B	A	B	A	-	-	-	-	C	C	D
Interchange Road & USH 14 NB Ramps	Traffic Signal	AM	C	A	-	-	D	C	D	D	C	-	-	-
		PM	B	A	-	-	D	D	C	C	C	-	-	-
Fish Hatchery Road & Lacy Road	Traffic Signal	AM	C	C	C	C	C	D	A	A	A	D	C	C
		PM	C	D	D	D	D	C	C	C	B	B	C	B
Lacy Road & Research Park Drive	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Mica Road	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	C	-	C	-	-	-
Lacy Road & Fahey Glen	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		
Lacy Road & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Lacy Road & Jones Farm Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	C	C	C
		PM	A	A	A	A	A	A	C	C	C	C	C	C
Lacy Road & Syene Road	Traffic Signal	AM	B	A	A	B	C	C	B	D	B	C	B	B
		PM	A	B	B	B	B	B	B	B	B	B	C	B
Lacy Road & Interchange Road/Nobel Drive	Roundabt	AM	A			B			A			A		
		PM	A			B			B			A		
Fish Hatchery Road & Nobel Drive	Traffic Signal	AM	C	C	C	D	D	C	B	D	C	D	A	A
		PM	C	C	C	D	D	C	C	B	B	A	B	A
Nobel Drive & Research Park Drive	Roundabt	AM	B			A			A			A		
		PM	A			A			A			A		
Nobel Drive & Mica Road	All-Way Stop	AM	B	B	B	B	B	B	B	B	A	B	B	A
		PM	A	B	B	B	B	B	B	B	A	B	B	A
Nobel Drive & Fahey Glen	Two-Way Stop	AM	A	A	A	A	A	A	C	C	C	C	C	C
		PM	A	A	A	A	A	A	B	B	B	C	C	C
Nobel Drive & Notre Dame Drive	Two-Way Stop	AM	A	A	A	A	A	A	B	B	B	B	B	B
		PM	A	A	A	A	A	A	B	B	B	B	B	B
Nobel Drive & Syene Road	Traffic Signal	AM	C	C	C	B	B	B	B	C	B	A	B	B
		PM	C	D	C	C	B	B	B	B	B	B	C	C
Fish Hatchery Road & Irish Lane	Traffic Signal	AM	-	-	-	C	-	D	-	A	A	A	A	-
		PM	-	-	-	D	-	D	-	A	A	A	A	-
Irish Lane & East Hill Drive	Two-Way Stop	AM	-	A	A	A	A	-	B	-	B	-	-	-
		PM	-	A	A	A	A	-	B	-	B	-	-	-
Irish Lane & Syene Road	Roundabt	AM	A			A			A			A		
		PM	A			A			A			A		

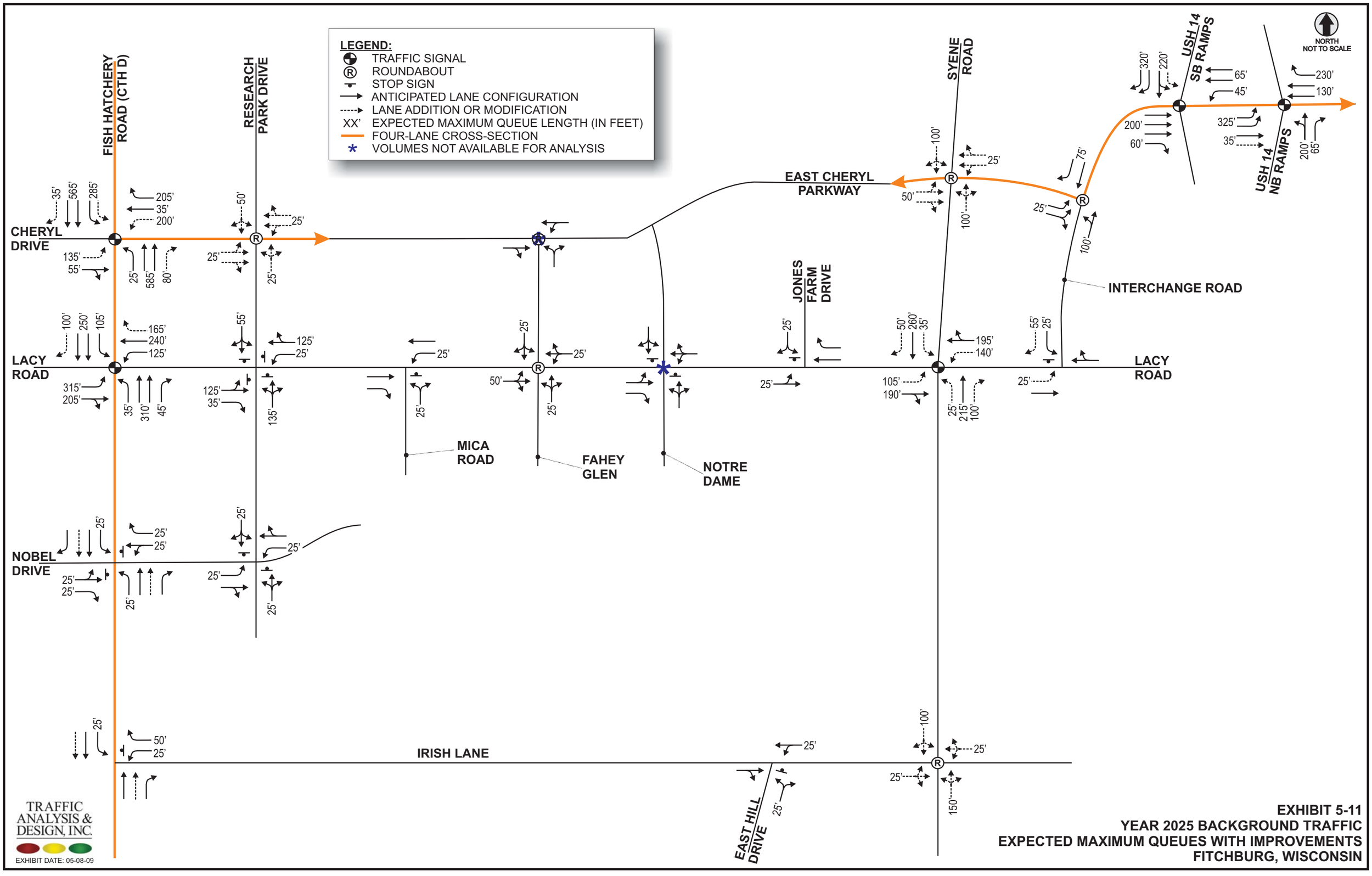
Notes: (-) indicates a movement that is not possible or is prohibited.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-9
YEAR 2035 BUILD TRAFFIC
PEAK HOUR OPERATING CONDITIONS - *WITH IMPROVEMENTS*
FITCHBURG, WISCONSIN

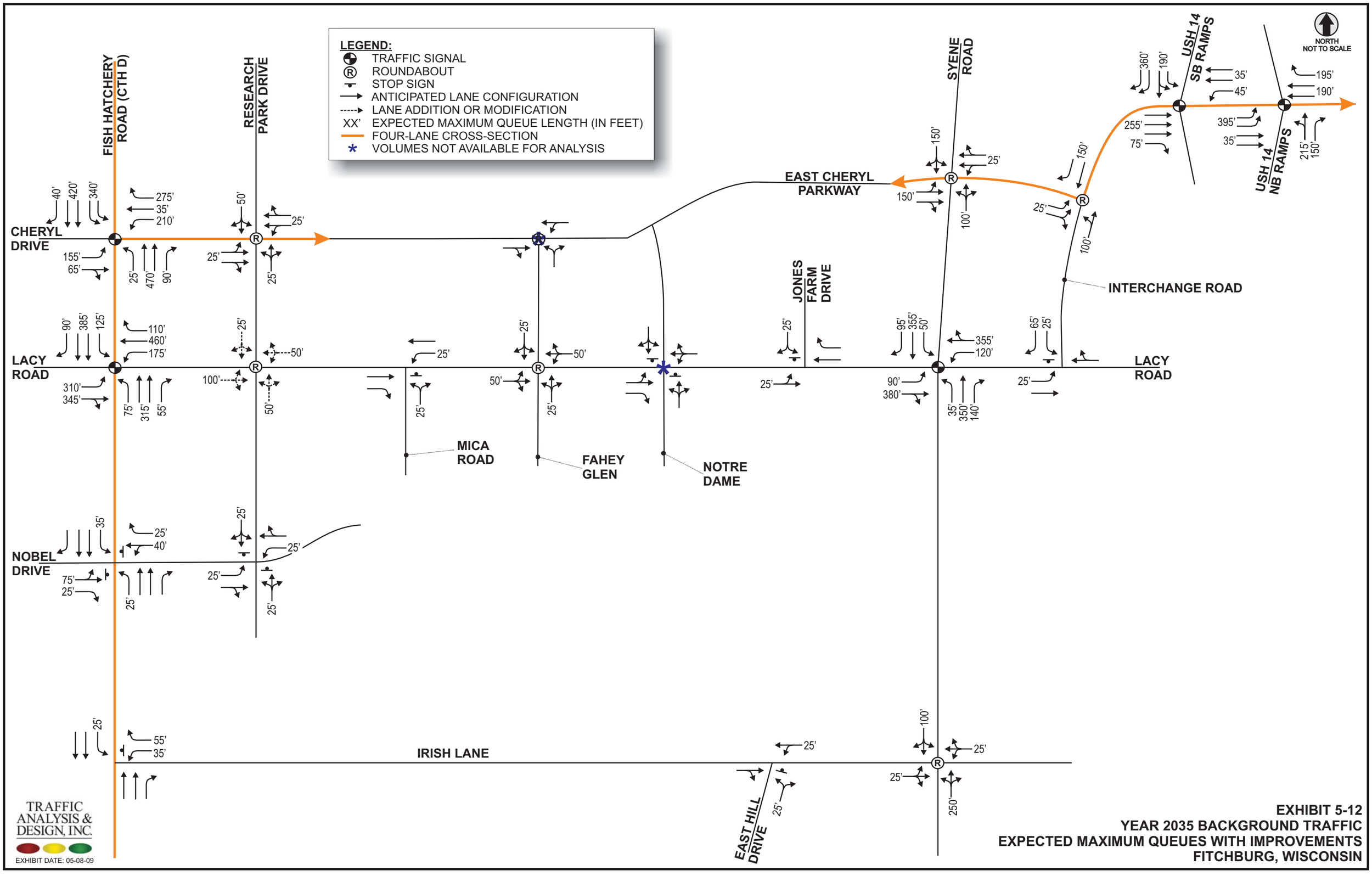

LEGEND:
TRAFFIC SIGNAL
ROUNDABOUT
STOP SIGN
ANTICIPATED LANE CONFIGURATION
LANE ADDITION OR MODIFICATION
XX' EXPECTED MAXIMUM QUEUE LENGTH (IN FEET)
FOUR-LANE CROSS-SECTION
* VOLUMES NOT AVAILABLE FOR ANALYSIS
NORTH
NOT TO SCALE
FISH HATCHERY ROAD (CTH D)
RESEARCH PARK DRIVE
SYENE ROAD
EAST CHERYL PARKWAY
CHERYL DRIVE
JONES FARM DRIVE
LACY ROAD
LACY ROAD
MICA ROAD
FAHEY GLEN
NOTRE DAME
NOBEL DRIVE
IRISH LANE
EAST HILL DRIVE
TRAFFIC ANALYSIS & DESIGN, INC.
EXHIBIT DATE: 05-08-09
EXHIBIT 5-10
YEAR 2008 EXISTING TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

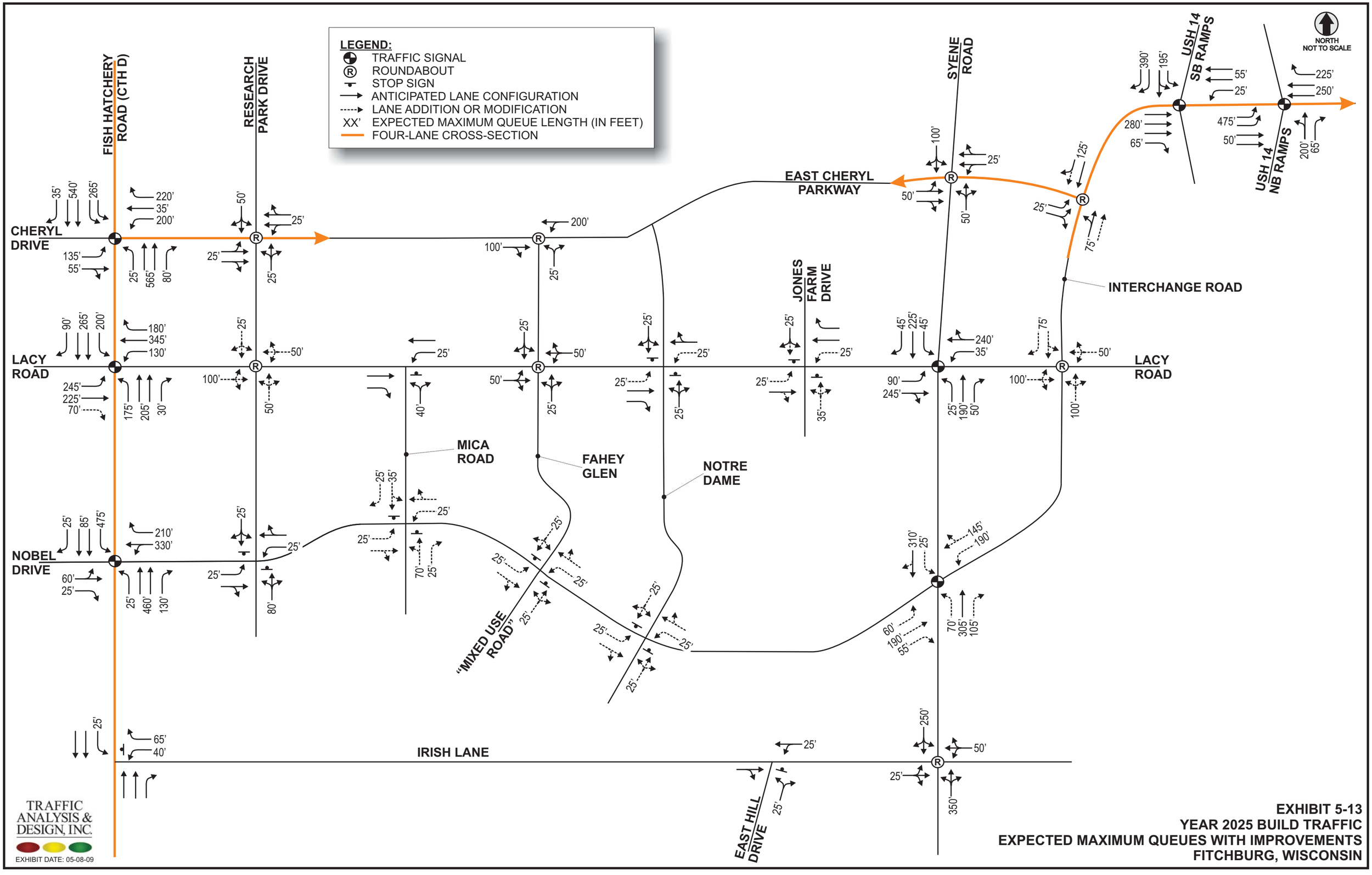
EXHIBIT 5-11
YEAR 2025 BACKGROUND TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

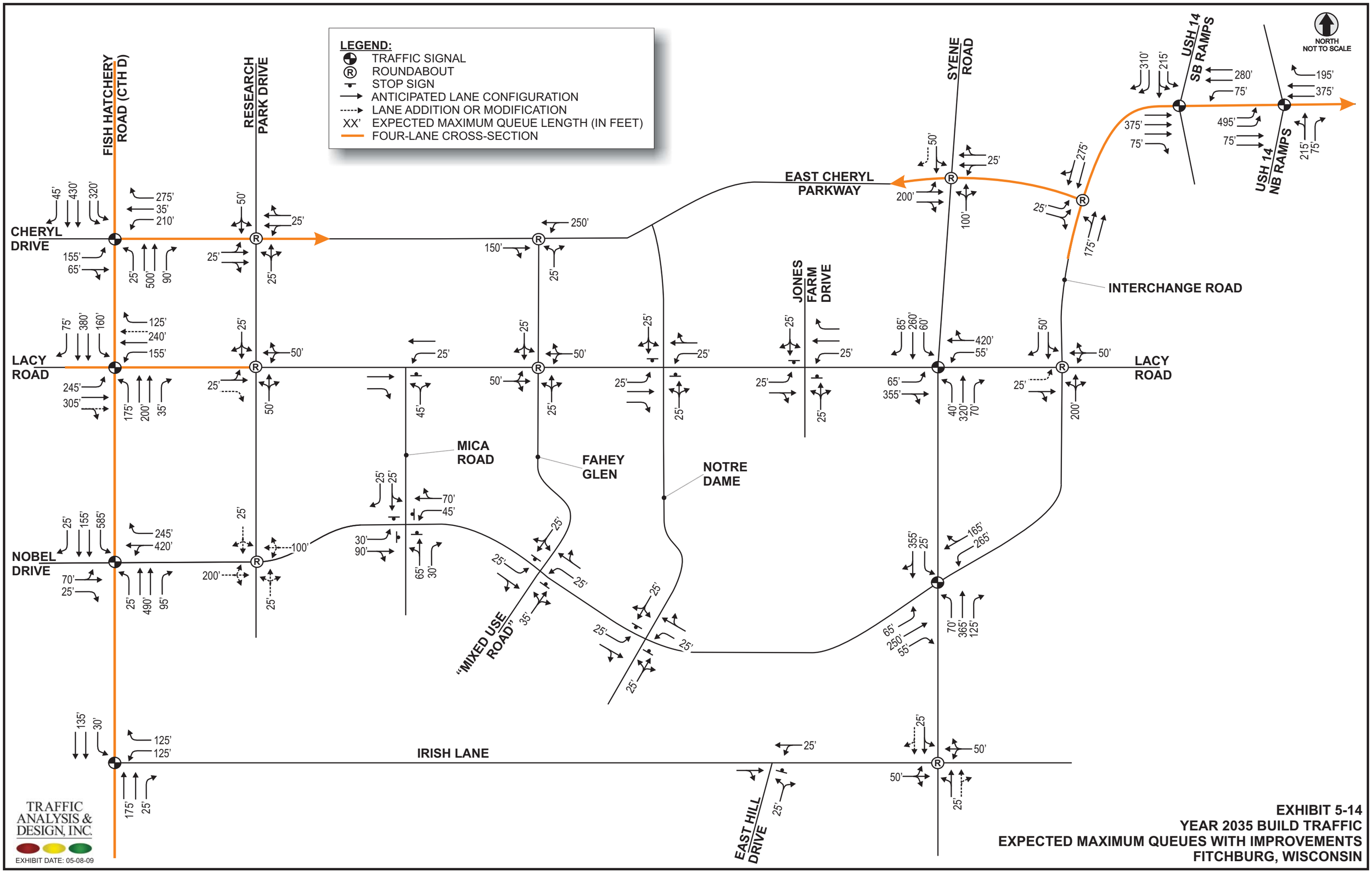
EXHIBIT 5-12
YEAR 2035 BACKGROUND TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-13
YEAR 2025 BUILD TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCHBURG, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 05-08-09

EXHIBIT 5-14
YEAR 2035 BUILD TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCHBURG, WISCONSIN

CHAPTER VI – RECOMMENDATIONS AND CONCLUSION

PART A – RECOMMENDATIONS

Based on the results of the analysis performed at the study area intersections, the following improvements are recommended. Note that LOS D or better conditions were used to define desirable peak hour operating conditions at the study area intersections.

A1. Year 2008 Existing Traffic Recommended Improvements

Year 2008 existing traffic volumes do not include any MPN development. The Year 2008 analysis was conducted using intersection geometrics and traffic signal sequencing anticipated upon completion of the Fish Hatchery Road improvements in the Year 2009. The following improvements are recommended to accommodate Year 2008 existing traffic.

Fish Hatchery Road & East Cheryl Parkway

- Extend the Fish Hatchery Road southbound left-turn lane.

Lacy Road & Syene Road

- Provide a Syene Road southbound channelized right-turn lane.

A2. Year 2025 Background Traffic Recommended Improvements

Year 2025 background traffic volumes assume growth within the study area, but do not include any MPN development. The Year 2025 background traffic analysis was conducted using intersection geometrics and traffic signal sequencing anticipated upon the completion of planned projects in the Year 2012, which include improvements to Fish Hatchery Road, improvements to Lacy Road, and construction of Interchange Road and the USH 14 interchange.

The following improvements are recommended to accommodate Year 2025 background traffic and are in addition to already planned improvements.

General Improvements

- Interchange Road is being planned as a four-lane roadway north of East Cheryl Parkway to CTH MM. Initially the roadway will be constructed as a two-lane facility east of USH 14. To accommodate Year 2025 background traffic, Interchange Road should be continued as a four-lane facility east of USH 14.
- East Cheryl Parkway should be widened to a four-lane roadway east of Fish Hatchery Road to east of Research Park Drive. The roadway should also be constructed/widened to a four-lane facility from Interchange Road to west of Syene Road. Note that Madison Area MPO daily traffic forecasts indicate that the stretch of roadway between these two widened areas will operate at the threshold between widening from a two-lane to four-lane roadway. That is, this section of roadway may operate as a two-lane roadway but may also require widening to four-lanes with or without the MPN.
- Widen Fish Hatchery Road to a four-lane divided highway south through Irish Lane.
- Coordinate traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Fish Hatchery Road & East Cheryl Parkway

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section east of Fish Hatchery Road to east of Research Park Drive.
- Provide dual left-turn lanes and an exclusive right-turn lane on the Fish Hatchery Road southbound approach.
- Provide a right-turn lane on the Fish Hatchery Road northbound approach.
- Provide a left-turn lane on the Cheryl Drive eastbound approach.
- Provide a left-turn lane on the East Cheryl Parkway westbound approach. Extend the existing westbound right-turn lane to a continuous lane, which will serve as a lane drop of the upstream outside through lane.
- Modify the traffic signals to include northbound/southbound protected-only left-turn signal heads and westbound to northbound permitted-overlap right-turn signal heads.

East Cheryl Parkway & Research Park Drive

- Construct the intersection with a two-lane modern roundabout, including two lane entries eastbound and westbound on East Cheryl Parkway, and one-lane entries northbound and southbound on Research Park Drive.

East Cheryl Parkway & Fahey Glen

- Recall that the City of Fitchburg plans to connect Fahey Glen from Lacy Road to an existing roundabout footprint located along East Cheryl Parkway at an unspecified future date. When this connection occurs, geometric modifications to the intersection design may be necessary so that the roundabout operates safely and efficiently as a modern roundabout.

East Cheryl Parkway & Syene Road

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section west of Interchange Road to west of Syene Road.
- Reconstruct the intersection with a two-lane modern roundabout, including two-lane entries eastbound and westbound on East Cheryl Parkway and one-lane entries northbound and southbound on Syene Road.

Interchange Road & East Cheryl Parkway

- As previously mentioned, widen East Cheryl Parkway to a four-lane cross-section west of Interchange Road to west of Syene Road.
- It was assumed that, when constructed, the intersection will operate as a two-lane modern roundabout, including a two lane entry eastbound on East Cheryl Parkway, a one-lane entry plus right-turn bypass lane southbound on Interchange Road, and a one-lane entry northbound on Interchange Road.

Interchange Road & USH 14 Ramps

- Provide an additional left-turn lane (i.e. dual left-turn lanes) and extend the planned dual right-turn lanes on the USH 14 southbound off-ramp.

- Provide an additional eastbound through lane on Interchange Road over USH 14 and east through the USH 14 northbound ramps to receive traffic from the recommended southbound dual left-turn lanes.
- Extend the right-turn lane on the Interchange Road eastbound approach to the USH 14 southbound ramps.
- Extend the right-turn lane on the Interchange Road westbound approach to the USH 14 northbound ramps.
- Ensure traffic signal plans include westbound protected-permitted left-turn signal heads at the USH 14 southbound ramps and eastbound protected-only left-turn signal heads at the USH 14 northbound ramps.

Fish Hatchery Road & Lacy Road

- Provide an exclusive right-turn lane on the Fish Hatchery Road southbound approach.
- Extend the Fish Hatchery Road northbound left-turn lane.
- Extend the Lacy Road eastbound left-turn lane.
- Provide an exclusive right-turn lane on the Lacy Road westbound approach.
- Modify the traffic signals to include northbound protected-permitted left-turn signal heads.

Lacy Road & Research Park Drive

- Install stop signs on all approaches to the intersection, resulting in all-way stop control.

Lacy Road & Mica Road

- The City plans to design Lacy Road from city hall to Fahey Glen in the Year 2011 to include left-turn lanes at Mica Road. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Fahey Glen

- The City plans to design a one-lane modern roundabout at this intersection in the Year 2011. Further, recall that the City plans to connect Fahey Glen from Lacy Road to East Cheryl Parkway at a future date. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Notre Dame Drive

- Recall that the City of Fitchburg plans to connect Notre Dame Drive from Lacy Road to East Cheryl Parkway at a future date. *No additional improvements are recommended at this intersection under Year 2025 background traffic volumes.*

Lacy Road & Syene Road

- Install traffic signals at the intersection.
- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road southbound approach.

- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road northbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Lacy Road westbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Lacy Road eastbound approach.
- Provide railroad preemption if the dormant rail corridor that lays immediately east of the intersection becomes active.

Lacy Road & Interchange Road

- Tee Interchange Road into Lacy Road from the north.
- Provide a left-turn lane on the Lacy Road eastbound approach.
- Provide a left-turn lane and a right-turn lane on the Interchange Road southbound approach.
- Install a stop sign to control the Interchange Road approach to Lacy Road.
- Note that if the east leg of Lacy Road would tee into west leg of Lacy Road and Interchange Road (i.e. if the west leg of Lacy Road would align with Interchange Road as a curve), the westbound left-turn volume would be such that intersection delay would increase, a wider cross-section would be necessary on Interchange Road, and in turn a wider crossing of the wetland north of the intersection could be necessary.

Fish Hatchery Road & Irish Lane

- As previously mentioned, widen Fish Hatchery Road to a four-lane cross-section south through Irish Lane.
- Provide a median of sufficient width to accommodate two-stage left-turn maneuvers from the Irish Lane approach (desirable width of 25-feet or greater).
- Extend the Fish Hatchery Road southbound left-turn lane.

Irish Lane & Syene Road

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

A3. Year 2035 Background Traffic Recommended Improvements

Year 2035 background traffic volumes assume growth within the study area, but do not include any MPN development. The following improvements are recommended to accommodate Year 2035 background traffic and are in addition to the Year 2025 background traffic recommended improvements.

Lacy Road & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

Lacy Road & Syene Road

- Install eastbound and westbound protected-permitted left-turn traffic signal heads.

Lacy Road & Interchange Road

- Provide a median of sufficient width to accommodate two-stage left-turn maneuvers from the Interchange Road approach (desirable width of 25-feet or greater).

Fish Hatchery Road & Nobel Drive

- Note that the eastbound left-turn and through movements may operate at LOS E/F conditions during the weekday peak hours. Volumes are not high enough to consider traffic signals. *No additional improvements are recommended at this intersection under Year 2035 background traffic volumes.*

A4. Year 2025 Build Traffic Recommended Improvements

Year 2025 build traffic volumes include Year 2025 background traffic plus traffic generated by phase one plus phase two of the MPN. The following improvements are recommended to accommodate Year 2025 build traffic and are in addition to the Year 2025 background traffic recommended improvements.

General Improvements

- Improve Lacy Road east of Fahey Glen to a similar cross-section to that which exists in front of city hall, with center left-turn lanes at Notre Dame Drive and Jones Farm Drive.

Interchange Road & East Cheryl Parkway

- Modify the roundabout to include two northbound and two southbound entries. Taper the resulting two southbound receiving lanes to one lane prior to crossing the wetland that exists north of Lacy Road.

Fish Hatchery Road & Lacy Road

- Extend the Fish Hatchery Road southbound left-turn lane.
- Extend the Fish Hatchery Road northbound left-turn lane.
- Provide an exclusive right-turn lane on the Lacy Road eastbound approach.

Lacy Road & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one-lane entries on each approach.

Lacy Road & Notre Dame Drive

- Provide a left-turn lane on the westbound Lacy Road approach.
- Provide a left-turn lane on the eastbound Lacy Road approach.

Lacy Road & Jones Farm Drive

- Provide a left-turn lane on the westbound Lacy Road approach.
- Provide a left-turn lane on the eastbound Lacy Road approach.

Lacy Road & Interchange Road/Nobel Drive

- Construct Nobel Drive to align with Interchange Road.

- Construct a one-lane modern roundabout with one-lane entries on the northbound, westbound and eastbound approaches, and a two-lane entry on the southbound approach.

Fish Hatchery Road & Nobel Drive

- Install traffic signals at the intersection, including southbound protected-permitted left-turn signal heads.
- Extend the Fish Hatchery Road southbound left-turn lane.
- Extend the Fish Hatchery Road northbound right-turn lane.
- Extend the Nobel Drive westbound right-turn lane.
- Coordinate the traffic signal with other traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Nobel Drive & Mica Road

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Mica Road approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through lane and an exclusive right-turn lane on the Mica Road southbound approach.
- Provide a shared left-turn/through lane and an exclusive right-turn lane on the Mica Road northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Fahey Glen/"Mixed Use" Road

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Fahey Glen approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through/right-turn lane on the Fahey Glen southbound approach.
- Provide a shared left-turn/through/right-turn lane on the "Mixed Use Road" northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Notre Dame Drive

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Notre Dame Drive approaches (minimum width of 22-feet).
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide an exclusive left-turn lane and a shared through/right-turn lane on the Nobel Drive eastbound approach.
- Provide a shared left-turn/through/right-turn lane on the Notre Dame Drive southbound approach.
- Provide a shared left-turn/through/right-turn lane on the Notre Dame Drive northbound approach.
- Install stop signs to control the northbound and southbound approaches.

Nobel Drive & Syene Road

- Install traffic signals at the intersection, including westbound protected-permitted left-turn signal heads.
- Provide a left-turn lane and a shared through/right-turn lane on the Syene Road southbound approach.
- Provide a left-turn lane, a through lane and a right-turn lane on the Syene Road northbound approach.
- Provide a left-turn lane and a shared through/right-turn lane on the Nobel Drive westbound approach.
- Provide a left-turn lane, a through lane and a right-turn lane on the Nobel Drive eastbound approach.
- Provide railroad preemption if the dormant rail corridor that lays immediately east of the intersection becomes active.

A5. Year 2035 Build Traffic Recommended Improvements

Year 2035 build traffic volumes include Year 2035 background traffic plus traffic generated by the full build-out of the MPN. The following improvements are recommended to accommodate Year 2025 build traffic and are in addition to the Year 2025 build traffic recommended improvements.

General Improvements

- Reserve right-of-way within the MPN boundaries along Syene Road, south of Nobel Drive, to accommodate a potential future four-lane facility.
- Widen Lacy Road to a four-lane facility west of Research Park Drive to west of Fish Hatchery Road.

East Cheryl Parkway & Syene Road

- Provide a flared right-turn on the Syene Road southbound approach.

Interchange Road & USH 14 Ramps

- Modify the traffic signal sequence of operations at the USH 14 southbound ramps to include a southbound right-turn only phase that will operate with the southbound left-turn phase as well as independently prior to the westbound through phase.
- Extend the Interchange Road eastbound pre-left-turn lane.

Fish Hatchery Road & Lacy Road

- As previously mentioned, widen Lacy Road to a four-lane facility west of Research Park Drive to west of Fish Hatchery Road.
- Provide an additional westbound through lane on Lacy Road through Fish Hatchery Road, then taper back to one lane west of the intersection.
- Provide an additional eastbound through lane on Lacy Road. An exclusive eastbound right-turn lane is no longer necessary

Lacy Road & Research Park Drive

- Modify the roundabout to accommodate an eastbound right-turn lane in the roundabout. The right-turn lane will serve as a lane drop of the upstream outside through lane.

Lacy Road & Jones Farm Drive

- Provide a median of sufficient width to accommodate two-stage left-turn and crossing maneuvers from the Jones Farm Drive approaches (minimum width of 22-feet).

Lacy Road & Syene Road

- Install eastbound protected-permitted left-turn signal heads.

Lacy Road & Interchange Road/Nobel Drive

- Widen the roundabout to accommodate two entry lanes on the Lacy Road eastbound approach.

Fish Hatchery Road & Nobel Drive

- Extend the Nobel Drive westbound right-turn lane.

Nobel Drive & Research Park Drive

- Reconstruct the intersection with a one-lane modern roundabout with one lane entries on each approach.

Nobel Drive & Mica Road

- Install stop signs to control the eastbound and westbound approaches, resulting in all-way stop control. A one-lane modern roundabout with one-lane entries on each approach can also be considered as an alternative.

Fish Hatchery Road & Irish Lane

- Install traffic signals at the intersection.

- Coordinate the traffic signal with other traffic signals along Fish Hatchery Road for more efficient operations during peak hours.

Irish Lane & Syene Road

- Reconstruct the roundabout to accommodate flared entries (i.e. two-lane entries) northbound and southbound on Syene Road. Taper the two-lanes back to one-lane in each direction downstream of the roundabout.

A6. Other Considerations

Syene Road intersection with Nobel Drive

As a guideline, all roadways within the MPNP should intersect between 75 and 105 degrees of each other – the closer to perpendicular the better. Further, the curb-to-curb area of the roadways should be located outside the drip lines of identified heritage trees and potential tree specimens, or a distance of approximately 30-feet. Meeting these constraints poses an issue for the Syene Road intersection with Nobel Drive.

Due to the proximity of an existing neighborhood to the northwest of the intersection, environmentally sensitive areas to the west and south of the intersection, and wetland corridors and tree specimens east of the intersection, the 100-foot ROW of Nobel Drive (66-feet curb to curb) cannot intersect Syene Road at an angle between 75 and 100 degrees.

With superelevation, which is recommended for its ability to reduce curve radii and thus reduce intersection skew, the closest intersection angle to perpendicular at the Nobel Drive crossing of Syene Road is 65 degrees. The corner of a residential lot in the northwest corner of the intersection may be clipped by the road making it necessary for a land purchase to accommodate the 100-foot ROW. Nobel Drive will also pass through the 300-foot environmental corridor, but not the 75-foot corridor, of a wetland on the east side of Syene Road.

While a skew is not ideal, the recommended placement of a traffic signal at this location in the future minimizes safety concerns typically found at skewed intersections. According to the American Association of State Highway and Transportation Officials' *Geometric Design of Highways and Streets 2004 (GDHS),* "an angle of at least 60 degrees provides most of the benefits of a 90-degree intersection while reducing right-of-way takings and construction costs often associated with providing a right-angle intersection." (GDHS, 581)

Syene Road intersection with Wildheather Drive

Wildheather Drive is an existing residential street that intersects Syene Road approximately 350-feet north of the proposed Syene Road intersection with Nobel Drive. Every effort should be made to maintain full access at the intersection in the future. Future access to the neighborhood can be made via Jones Farm Drive, or via a connection to Syene Road from the western TOD area.

Construction Phasing

The costs associated with providing infrastructure prior to development may make constructing the entire extent of Nobel Drive at one time unfeasible. Construction will most likely need to be performed as development occurs. The initial phasing of the MPN includes development west of Fahey Glen and east of Syene Road. To accommodate this phasing:

- It is recommended to construct Nobel Drive to Fahey Glen and Fahey Glen to Nobel Drive as part of the initial development of the western portion of the plan. This construction will provide development on the western portion of the MPN at least two

points of access to the existing roadway system, which is desirable for emergency operations. The MPN Steering Committee further recommends that Fahey Glen be extended north to East Cheryl Parkway under phase one as well, to draw traffic away from Mica Road and Lacy Road.

- It is recommended to construct Nobel Drive between Syene Road and Lacy Road as part of the initial development of the eastern portion of the plan. Blaney Road should be removed when this construction occurs. Note that the existing processing facility (Hartung property) east of Syene Road at the proposed Nobel Drive crossing may not be relocated in time. If this relocation is not performed in time, it is recommended to construct a secondary access to Lacy Road approximately half the distance between the proposed Nobel Drive intersection and USH 14.
- Construction of the remaining extent of Nobel Drive, from Fahey Glen to Syene Road, can be phased in over time as development plans come to fruition in the middle of the Neighborhood.

PART B – CONCLUSION

All movements at the study area intersections are expected to operate safely and efficiently with the recommended improvements.

It is important to note that this TIA analyzes traffic estimates sixteen to twenty-six years into the future and has been done as a planning study rather than for specifically-known development end users. The years shown are approximate for the purpose of the traffic analysis. The further into the future a forecast is carried the greater the opportunity for error. Implementation of the land use plan may also result in end users with greater or lesser trip intensities than those reflected by ITE trip rates and this TIA. Caution should be taken to implement phased improvements in a manner that minimizes impacts to the motoring public and the surrounding environment, but that does not result in a system that is overbuilt. On that same note, caution should be given to preserving and dedicating right-of-way for future improvements should they be needed as outlined in this study. It is recommended to perform updated traffic impact analyses as development occurs to validate the findings of this TIA.

APPENDIX A

EXISTING TRAFFIC COUNTS, EXISTING SIGNAL TIMINGS, MPO ADT FORECASTS, & BIKE/PED PLAN MAPS

APPENDIX A

Existing Traffic Counts

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Fish Hatchery and Irish Lane**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Friday, May 30, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fish Hatchery From North				Irish Lane From East				Fish Hatchery From South				Irish Lane From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	0	28	3	0	15	0	7	0	6	105	0	0	0	0	0	0	164
7:15 AM	0	25	2	0	19	0	1	0	10	134	0	0	0	0	0	0	191
7:30 AM	0	43	8	0	23	0	4	0	10	153	0	0	0	0	0	0	241
7:45 AM	0	24	13	0	32	0	4	0	12	167	0	0	0	0	0	0	252
Peak Hour Volume	**0**	**120**	**26**	**0**	**89**	**0**	**16**	**0**	**38**	**559**	**0**	**0**	**0**	**0**	**0**	**0**	**848**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**146**				**105**				**597**				**0**			**848**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	3.3%	3.8%		1.1%	0.0%	0.0%		0.0%	1.8%	0.0%		0.0%	0.0%	0.0%		1.9%
% Heavy Trucks	0.0%	3.4%	0.0%		0.0%	0.0%	6.2%		0.0%	0.5%	0.0%		0.0%	0.0%	0.0%		0.9%
% Trucks (Total)	**0.0%**	**6.7%**	**3.8%**		**1.1%**	**0.0%**	**6.2%**		**0.0%**	**2.3%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**2.8%**
By Approach		**6.2%**				**1.9%**				**2.2%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0.70**	**0.50**		**0.70**	**0**	**0.57**		**0.79**	**0.84**	**0**		**0**	**0**	**0**		**0.84**
By Approach		**0.72**				**0.73**				**0.83**				**0**			
HOURLY VOLUME-ROUNDED	**0**	**120**	**25**	**0**	**90**	**0**	**15**	**0**	**40**	**560**	**0**	**0**	**0**	**0**	**0**	**0**	**850**
By Approach		**145**				**105**				**600**				**0**			

P.M. PEAK Monday, June 09, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fish Hatchery From North				Irish Lane From East				Fish Hatchery From South				Irish Lane From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	0	138	22	0	6	0	4	0	4	44	0	0	0	0	0	0	218
4:30 PM	0	139	20	0	9	0	13	0	1	50	0	0	0	0	0	0	232
4:45 PM	0	132	23	0	10	0	10	0	3	57	0	0	0	0	0	1	235
5:00 PM	0	184	27	0	8	0	8	0	7	43	0	0	0	0	0	0	277
Peak Hour Volume	**0**	**593**	**92**	**0**	**33**	**0**	**35**	**0**	**15**	**194**	**0**	**0**	**0**	**0**	**0**	**1**	**962**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**685**				**68**				**209**				**0**			**962**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.3%	1.1%		0.0%	0.0%	8.6%		0.0%	1.0%	0.0%		0.0%	0.0%	0.0%		0.8%
% Heavy Trucks	0.0%	0.5%	0.0%		0.0%	0.0%	0.0%		6.7%	0.5%	0.0%		0.0%	0.0%	0.0%		0.5%
% Trucks (Total)	**0.0%**	**0.8%**	**1.1%**		**0.0%**	**0.0%**	**8.6%**		**6.7%**	**1.5%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**1.4%**
By Approach		**0.8%**				**4.4%**				**1.9%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0.81**	**0.85**		**0.83**	**0**	**0.67**		**0.54**	**0.85**	**0**		**0**	**0**	**0**		**0.87**
By Approach		**0.81**				**0.77**				**0.87**				**0**			
HOURLY VOLUME-ROUNDED	**0**	**595**	**90**	**0**	**35**	**0**	**35**	**0**	**15**	**195**	**0**	**0**	**0**	**0**	**0**	**1**	**965**
By Approach		**685**				**70**				**210**				**0**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Irish
Site Code : 00000000
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	S FISH HATCHERY RD From North				IRISH LANE From East				S FISH HATCHERY RD From South				IRISH LANE From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	3	28	0	0	7	0	15	0	0	105	6	0	0	0	0	0	164
07:15 AM	2	25	0	0	1	0	19	0	0	134	10	0	0	0	0	0	191
07:30 AM	8	43	0	0	4	0	23	0	0	153	10	0	0	0	0	0	241
07:45 AM	13	24	0	0	4	0	32	0	0	167	12	0	0	0	0	0	252
Total	26	120	0	0	16	0	89	0	0	559	38	0	0	0	0	0	848
08:00 AM	5	34	0	0	3	0	8	0	0	123	14	0	0	0	0	0	187
08:15 AM	7	25	0	0	3	0	13	0	0	123	10	0	0	0	0	0	181
08:30 AM	7	39	0	0	0	0	16	0	0	67	5	0	0	0	0	0	134
08:45 AM	6	26	0	0	3	0	8	0	0	66	3	0	0	0	0	0	112
Total	25	124	0	0	9	0	45	0	0	379	32	0	0	0	0	0	614
04:00 PM	17	142	0	0	8	0	9	0	0	40	4	0	0	0	0	0	220
04:15 PM	22	138	0	0	4	0	6	0	0	44	4	0	0	0	0	0	218
04:30 PM	20	139	0	0	13	0	9	0	0	50	1	0	0	0	0	0	232
04:45 PM	23	132	0	0	10	0	10	0	0	57	3	0	0	0	0	1	236
Total	82	551	0	0	35	0	34	0	0	191	12	0	0	0	0	1	906
05:00 PM	27	184	0	0	8	0	8	0	0	43	7	0	0	0	0	0	277
05:15 PM	22	185	0	0	18	0	16	0	0	58	2	0	0	0	0	0	301
05:30 PM	19	138	0	0	13	0	17	0	0	51	1	0	0	0	0	0	239
05:45 PM	24	147	0	0	5	0	7	1	0	41	1	0	0	0	0	0	226
Total	92	654	0	0	44	0	48	1	0	193	11	0	0	0	0	0	1043
Grand Total	225	1449	0	0	104	0	216	1	0	1322	93	0	0	0	0	1	3411
Apprch %	13.4	86.6	0	0	32.4	0	67.3	0.3	0	93.4	6.6	0	0	0	0	100	
Total %	6.6	42.5	0	0	3	0	6.3	0	0	38.8	2.7	0	0	0	0	0	
cars	220	1425	0	0	99	0	214	0	0	1295	90	0	0	0	0	1	3344
% cars	97.8	98.3	0	0	95.2	0	99.1	0	0	98	96.8	0	0	0	0	100	98
Bus_Light Med Trucks	5	13	0	0	3	0	2	1	0	19	1	0	0	0	0	0	44
% Bus_Light Med Trucks	2.2	0.9	0	0	2.9	0	0.9	100	0	1.4	1.1	0	0	0	0	0	1.3
Heavy Trucks	0	11	0	0	2	0	0	0	0	8	2	0	0	0	0	0	23
% Heavy Trucks	0	0.8	0	0	1.9	0	0	0	0	0.6	2.2	0	0	0	0	0	0.7

Traffic Analysis & Design, Inc.

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Cedarburg, WI 53012

File Name : FishHatchery-Irish
Site Code : 00000000
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Groups Printed- cars

	S FISH HATCHERY RD From North				IRISH LANE From East				S FISH HATCHERY RD From South				IRISH LANE From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	27	0	0	6	0	15	0	0	101	6	0	0	0	0	0	157
07:15 AM	2	22	0	0	1	0	19	0	0	130	10	0	0	0	0	0	184
07:30 AM	8	41	0	0	4	0	23	0	0	152	10	0	0	0	0	0	238
07:45 AM	13	22	0	0	4	0	31	0	0	163	12	0	0	0	0	0	245
Total	25	112	0	0	15	0	88	0	0	546	38	0	0	0	0	0	824
08:00 AM	5	33	0	0	3	0	8	0	0	121	13	0	0	0	0	0	183
08:15 AM	7	22	0	0	3	0	13	0	0	121	10	0	0	0	0	0	176
08:30 AM	7	36	0	0	0	0	16	0	0	66	4	0	0	0	0	0	129
08:45 AM	6	25	0	0	3	0	8	0	0	62	3	0	0	0	0	0	107
Total	25	116	0	0	9	0	45	0	0	370	30	0	0	0	0	0	595
04:00 PM	17	142	0	0	7	0	9	0	0	39	4	0	0	0	0	0	218
04:15 PM	21	136	0	0	4	0	6	0	0	43	4	0	0	0	0	0	214
04:30 PM	20	138	0	0	12	0	9	0	0	50	1	0	0	0	0	0	230
04:45 PM	23	132	0	0	8	0	10	0	0	55	3	0	0	0	0	1	232
Total	81	548	0	0	31	0	34	0	0	187	12	0	0	0	0	1	894
05:00 PM	27	182	0	0	8	0	8	0	0	43	6	0	0	0	0	0	274
05:15 PM	19	184	0	0	18	0	15	0	0	57	2	0	0	0	0	0	295
05:30 PM	19	137	0	0	13	0	17	0	0	51	1	0	0	0	0	0	238
05:45 PM	24	146	0	0	5	0	7	0	0	41	1	0	0	0	0	0	224
Total	89	649	0	0	44	0	47	0	0	192	10	0	0	0	0	0	1031
Grand Total	220	1425	0	0	99	0	214	0	0	1295	90	0	0	0	0	1	3344
Apprch %	13.4	86.6	0	0	31.6	0	68.4	0	0	93.5	6.5	0	0	0	0	100	
Total %	6.6	42.6	0	0	3	0	6.4	0	0	38.7	2.7	0	0	0	0	0	

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Site Code : 00000000
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Groups Printed- Bus_Light Med Trucks

	S FISH HATCHERY RD From North				IRISH LANE From East				S FISH HATCHERY RD From South				IRISH LANE From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5
07:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
07:30 AM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
07:45 AM	0	1	0	0	0	0	1	0	0	2	0	0	0	0	0	0	4
Total	1	4	0	0	0	0	1	0	0	10	0	0	0	0	0	0	16
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:15 AM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
08:30 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
08:45 AM	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	5
Total	0	4	0	0	0	0	0	0	0	6	1	0	0	0	0	0	11
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:15 PM	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	3
Total	1	2	0	0	3	0	0	0	0	3	0	0	0	0	0	0	9
05:15 PM	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Total	3	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	8
Grand Total	5	13	0	0	3	0	2	1	0	19	1	0	0	0	0	0	44
Apprch %	27.8	72.2	0	0	50	0	33.3	16.7	0	95	5	0	0	0	0	0	
Total %	11.4	29.5	0	0	6.8	0	4.5	2.3	0	43.2	2.3	0	0	0	0	0	

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File Name : FishHatchery-Irish
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Groups Printed- Heavy Trucks

	S FISH HATCHERY RD From North				IRISH LANE From East				S FISH HATCHERY RD From South				IRISH LANE From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
07:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:45 AM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	0	4	0	0	1	0	0	0	0	3	0	0	0	0	0	0	8
08:00 AM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
08:15 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
08:30 AM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Total	0	4	0	0	0	0	0	0	0	3	1	0	0	0	0	0	8
04:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3
05:00 PM	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	4
Grand Total	0	11	0	0	2	0	0	0	0	8	2	0	0	0	0	0	23
Apprch %	0	100	0	0	100	0	0	0	0	80	20	0	0	0	0	0	
Total %	0	47.8	0	0	8.7	0	0	0	0	34.8	8.7	0	0	0	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Fish Hatchrey and Lacy Road**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Thursday, May 29, 2008	↓ Fish Hatchrey From North				← Lacy Road From East				↑ Fish Hatchrey From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	10	50	15	1	19	18	5	0	8	134	10	0	6	33	34	0	342
7:15 AM	13	32	16	0	34	18	2	0	14	171	7	1	4	28	49	1	388
7:30 AM	14	43	17	0	40	25	6	0	20	204	14	0	8	64	63	0	518
7:45 AM	15	59	25	0	39	31	7	0	13	186	11	1	6	68	44	0	504
Peak Hour Volume	**52**	**184**	**73**	**1**	**132**	**92**	**20**	**0**	**55**	**695**	**42**	**2**	**24**	**193**	**190**	**1**	**1,752**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**309**				**244**				**792**				**407**			**1,752**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	4.9%	2.7%		3.0%	3.3%	20.0%		0.0%	1.6%	4.8%		12.5%	3.6%	1.1%		2.7%
% Heavy Trucks	0.0%	0.5%	1.4%		0.0%	0.0%	0.0%		0.0%	0.6%	0.0%		0.0%	0.0%	0.0%		0.3%
% Trucks (Total)	**0.0%**	**5.4%**	**4.1%**		**3.0%**	**3.3%**	**20.0%**		**0.0%**	**2.2%**	**4.8%**		**12.5%**	**3.6%**	**1.1%**		**3.0%**
By Approach		**4.2%**				**4.5%**				**2.2%**				**3.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.87**	**0.78**	**0.73**		**0.83**	**0.74**	**0.71**		**0.69**	**0.85**	**0.75**		**0.75**	**0.71**	**0.75**		**0.85**
By Approach		**0.78**				**0.79**				**0.83**				**0.75**			
HOURLY VOLUME-ROUNDED	**50**	**185**	**75**	**1**	**130**	**90**	**20**	**0**	**55**	**695**	**40**	**2**	**25**	**195**	**190**	**1**	**1,750**
By Approach		**310**				**240**				**790**				**410**			

P.M. PEAK Wednesday, May 28, 2008	↓ Fish Hatchrey From North				← Lacy Road From East				↑ Fish Hatchrey From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	31	106	55	0	19	38	11	0	7	65	11	0	7	22	14	0	386
4:30 PM	35	159	36	1	33	57	14	0	8	67	12	0	11	29	16	0	477
4:45 PM	43	197	49	2	22	63	29	0	7	74	14	1	11	36	14	2	559
5:00 PM	39	139	50	1	22	65	25	0	7	80	21	0	13	27	22	0	510
Peak Hour Volume	**148**	**601**	**190**	**4**	**96**	**223**	**79**	**0**	**29**	**286**	**58**	**1**	**42**	**114**	**66**	**2**	**1,932**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**939**				**398**				**373**				**222**			**1,932**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.7%	1.2%	1.6%		3.1%	3.1%	2.5%		6.9%	1.7%	0.0%		0.0%	0.9%	3.0%		1.7%
% Heavy Trucks	0.7%	0.6%	0.0%		0.0%	0.5%	2.6%		3.4%	0.7%	0.0%		0.0%	0.9%	0.0%		0.6%
% Trucks (Total)	**1.4%**	**1.8%**	**1.6%**		**3.1%**	**3.6%**	**5.1%**		**10.3%**	**2.4%**	**0.0%**		**0.0%**	**1.8%**	**3.0%**		**2.3%**
By Approach		**1.7%**				**3.8%**				**2.6%**				**1.8%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.86**	**0.76**	**0.86**		**0.73**	**0.86**	**0.68**		**0.91**	**0.89**	**0.69**		**0.81**	**0.79**	**0.75**		**0.86**
By Approach		**0.81**				**0.87**				**0.86**				**0.90**			
HOURLY VOLUME-ROUNDED	**150**	**600**	**190**	**4**	**95**	**225**	**80**	**0**	**30**	**285**	**60**	**1**	**40**	**115**	**65**	**2**	**1,935**
By Approach		**940**				**400**				**375**				**220**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Lacy
Site Code : 00000000
Start Date : 5/29/2008
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	S FISH HATCHERY RD From North				LACY RD From East				S FISH HATCHERY RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	15	50	10	1	5	18	19	0	10	134	8	0	34	33	6	0	343
07:15 AM	16	32	13	0	2	18	34	0	7	171	14	1	49	28	4	1	390
07:30 AM	17	43	14	0	6	25	40	0	14	204	20	0	63	64	8	0	518
07:45 AM	25	59	15	0	7	31	39	0	11	186	13	1	44	68	6	0	505
Total	73	184	52	1	20	92	132	0	42	695	55	2	190	193	24	1	1756
08:00 AM	20	55	12	0	12	16	35	0	15	144	13	0	51	31	10	0	414
08:15 AM	21	64	9	0	8	22	20	0	5	152	11	2	44	40	6	1	405
08:30 AM	16	46	10	1	6	10	27	2	4	103	10	0	28	27	8	0	298
08:45 AM	20	53	11	0	5	12	19	0	9	70	6	0	15	15	6	0	241
Total	77	218	42	1	31	60	101	2	33	469	40	2	138	113	30	1	1358
03:00 PM	31	87	26	1	5	13	29	0	7	53	3	0	8	15	7	0	285
03:15 PM	18	74	27	0	9	20	19	0	6	52	1	0	10	11	4	0	251
03:30 PM	29	115	27	1	10	23	20	0	9	69	4	1	18	17	5	0	348
03:45 PM	32	119	20	0	11	22	25	0	8	60	7	1	18	24	8	1	356
Total	110	395	100	2	35	78	93	0	30	234	15	2	54	67	24	1	1240
04:00 PM	31	115	25	2	22	24	25	0	12	84	7	0	19	25	9	1	401
04:15 PM	55	106	31	0	11	38	19	0	11	65	7	0	14	22	7	0	386
04:30 PM	36	159	35	1	14	57	33	0	12	67	8	0	16	29	11	0	478
04:45 PM	49	197	43	2	29	63	22	0	14	74	7	1	14	36	11	2	564
Total	171	577	134	5	76	182	99	0	49	290	29	1	63	112	38	3	1829
05:00 PM	50	139	39	1	25	65	22	0	21	80	7	0	22	27	13	0	511
05:15 PM	47	147	55	0	21	74	25	0	14	77	6	0	24	27	7	2	526
05:30 PM	58	152	51	0	17	41	16	1	11	74	5	0	16	26	12	0	480
05:45 PM	40	105	34	0	9	27	34	3	13	69	9	0	18	21	4	0	386
Total	195	543	179	1	72	207	97	4	59	300	27	0	80	101	36	2	1903
Grand Total	626	1917	507	10	234	619	522	6	213	1988	166	7	525	586	152	8	8086
Apprch %	20.5	62.6	16.6	0.3	16.9	44.8	37.8	0.4	9	83.7	7	0.3	41.3	46.1	12	0.6	
Total %	7.7	23.7	6.3	0.1	2.9	7.7	6.5	0.1	2.6	24.6	2.1	0.1	6.5	7.2	1.9	0.1	
cars	607	1863	498	2	219	595	507	3	208	1929	154	2	518	570	146	3	7824
% cars	97	97.2	98.2	20	93.6	96.1	97.1	50	97.7	97	92.8	28.6	98.7	97.3	96.1	37.5	96.8
Bus_Light Med Trucks	15	45	5	7	11	21	15	3	4	43	7	4	6	15	6	5	212
% Bus_Light Med Trucks	2.4	2.3	1	70	4.7	3.4	2.9	50	1.9	2.2	4.2	57.1	1.1	2.6	3.9	62.5	2.6
Heavy Trucks	4	9	4	1	4	3	0	0	1	16	5	1	1	1	0	0	50
% Heavy Trucks	0.6	0.5	0.8	10	1.7	0.5	0	0	0.5	0.8	3	14.3	0.2	0.2	0	0	0.6

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Lacy
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Groups Printed- cars

	S FISH HATCHERY RD From North				LACY RD From East				S FISH HATCHERY RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	14	46	10	0	4	16	19	0	9	131	8	0	34	33	5	0	329
07:15 AM	15	30	13	0	2	17	32	0	6	166	14	0	47	26	3	0	371
07:30 AM	16	42	14	0	3	25	39	0	14	203	20	0	63	59	8	0	506
07:45 AM	25	56	15	0	7	31	38	0	11	180	13	1	44	68	5	0	494
Total	70	174	52	0	16	89	128	0	40	680	55	1	188	186	21	0	1700
08:00 AM	20	53	12	0	9	14	34	0	15	144	13	0	50	30	10	0	404
08:15 AM	21	55	9	0	7	21	19	0	4	143	10	0	44	40	6	0	379
08:30 AM	15	44	10	1	6	10	27	2	4	102	9	0	28	27	8	0	293
08:45 AM	16	50	10	0	4	11	19	0	8	69	5	0	14	15	5	0	226
Total	72	202	41	1	26	56	99	2	31	458	37	0	136	112	29	0	1302
03:00 PM	28	86	24	0	5	12	27	0	6	49	2	0	8	15	7	0	269
03:15 PM	17	72	27	0	9	18	19	0	6	49	1	0	10	11	4	0	243
03:30 PM	26	115	25	0	9	22	19	0	9	66	3	0	18	15	4	0	331
03:45 PM	31	117	18	0	11	21	24	0	8	57	6	1	17	22	8	1	342
Total	102	390	94	0	34	73	89	0	29	221	12	1	53	63	23	1	1185
04:00 PM	31	110	25	0	22	23	25	0	12	79	5	0	19	25	9	1	386
04:15 PM	53	102	29	0	9	37	19	0	11	62	6	0	14	22	7	0	371
04:30 PM	36	157	35	0	14	52	32	0	12	67	6	0	16	29	11	0	467
04:45 PM	48	194	43	0	27	63	20	0	14	71	7	0	12	34	11	1	545
Total	168	563	132	0	72	175	96	0	49	279	24	0	61	110	38	2	1769
05:00 PM	50	137	39	1	25	63	22	0	21	79	7	0	22	27	13	0	506
05:15 PM	47	146	55	0	21	73	24	0	14	75	6	0	24	27	7	0	519
05:30 PM	58	148	51	0	16	40	16	1	11	69	5	0	16	24	11	0	466
05:45 PM	40	103	34	0	9	26	33	0	13	68	8	0	18	21	4	0	377
Total	195	534	179	1	71	202	95	1	59	291	26	0	80	99	35	0	1868
Grand Total	607	1863	498	2	219	595	507	3	208	1929	154	2	518	570	146	3	7824
Apprch %	20.4	62.7	16.8	0.1	16.5	44.9	38.3	0.2	9.1	84.1	6.7	0.1	41.9	46.1	11.8	0.2	
Total %	7.8	23.8	6.4	0	2.8	7.6	6.5	0	2.7	24.7	2	0	6.6	7.3	1.9	0	

Traffic Analysis & Design, Inc.

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File Name : FishHatchery-Lacy
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Groups Printed- Bus_Light Med Trucks

	S FISH HATCHERY RD From North				LACY RD From East				S FISH HATCHERY RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	4	0	1	1	2	0	0	1	1	0	0	0	0	1	0	12
07:15 AM	1	2	0	0	0	1	2	0	1	4	0	1	2	2	1	1	18
07:30 AM	0	0	0	0	3	0	1	0	0	0	0	0	0	5	0	0	9
07:45 AM	0	3	0	0	0	0	1	0	0	6	0	0	0	0	1	0	11
Total	2	9	0	1	4	3	4	0	2	11	0	1	2	7	3	1	50
08:00 AM	0	2	0	0	3	2	1	0	0	0	0	0	1	1	0	0	10
08:15 AM	0	8	0	0	0	1	1	0	0	8	1	2	0	0	0	1	22
08:30 AM	1	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	5
08:45 AM	2	3	1	0	0	1	0	0	1	1	0	0	1	0	1	0	11
Total	3	15	1	0	3	4	2	0	1	10	2	2	2	1	1	1	48
03:00 PM	3	1	2	1	0	1	2	0	1	3	1	0	0	0	0	0	15
03:15 PM	0	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	5
03:30 PM	3	0	0	0	1	1	1	0	0	3	0	0	0	2	1	0	12
03:45 PM	1	1	1	0	0	1	1	0	0	1	0	0	0	2	0	0	8
Total	7	4	3	1	1	5	4	0	1	8	1	0	0	4	1	0	40
04:00 PM	0	4	0	2	0	0	0	0	0	3	1	0	0	0	0	0	10
04:15 PM	2	3	1	0	2	1	0	0	0	2	1	0	0	0	0	0	12
04:30 PM	0	2	0	1	0	4	1	0	0	0	1	0	0	0	0	0	9
04:45 PM	1	0	0	2	0	0	2	0	0	3	0	1	2	1	0	1	13
Total	3	9	1	5	2	5	3	0	0	8	3	1	2	1	0	1	44
05:00 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
05:15 PM	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	2	6
05:30 PM	0	4	0	0	1	0	0	0	0	5	0	0	0	2	1	0	13
05:45 PM	0	1	0	0	0	1	1	3	0	0	1	0	0	0	0	0	7
Total	0	8	0	0	1	4	2	3	0	6	1	0	0	2	1	2	30
Grand Total	15	45	5	7	11	21	15	3	4	43	7	4	6	15	6	5	212
Apprch %	20.8	62.5	6.9	9.7	22	42	30	6	6.9	74.1	12.1	6.9	18.8	46.9	18.8	15.6	
Total %	7.1	21.2	2.4	3.3	5.2	9.9	7.1	1.4	1.9	20.3	3.3	1.9	2.8	7.1	2.8	2.4	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Lacy
Site Code : 00000000
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Groups Printed- Heavy Trucks

	S FISH HATCHERY RD From North				LACY RD From East				S FISH HATCHERY RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:30 AM	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Total	1	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	6
08:15 AM	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	4
08:45 AM	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	4
Total	2	1	0	0	2	0	0	0	1	1	1	0	0	0	0	0	8
03:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
03:15 PM	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
03:30 PM	0	0	2	1	0	0	0	0	0	0	1	1	0	0	0	0	5
03:45 PM	0	1	1	0	0	0	0	0	0	2	1	0	1	0	0	0	6
Total	1	1	3	1	0	0	0	0	0	5	2	1	1	0	0	0	15
04:00 PM	0	1	0	0	0	1	0	0	0	2	1	0	0	0	0	0	5
04:15 PM	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
04:45 PM	0	3	0	0	2	0	0	0	0	0	0	0	0	1	0	0	6
Total	0	5	1	0	2	2	0	0	0	3	2	0	0	1	0	0	16
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0	0	5
Grand Total	4	9	4	1	4	3	0	0	1	16	5	1	1	1	0	0	50
Apprch %	22.2	50	22.2	5.6	57.1	42.9	0	0	4.3	69.6	21.7	4.3	50	50	0	0	
Total %	8	18	8	2	8	6	0	0	2	32	10	2	2	2	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Fish Hatchery and Nobel Drive**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Thursday, May 29, 2008	↓ Fish Hatchery From North				← Nobel Drive From East				↑ Fish Hatchery From South				→ Nobel Drive From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	4	42	10	1	1	1	0	0	5	139	1	0	1	0	10	0	214
7:15 AM	3	28	5	1	4	1	1	0	6	164	2	1	3	0	8	1	225
7:30 AM	3	36	12	1	2	0	1	0	5	214	0	0	3	1	11	0	288
7:45 AM	4	39	21	0	1	0	3	0	14	183	0	1	1	1	8	0	275
Peak Hour Volume	**14**	**145**	**48**	**3**	**8**	**2**	**5**	**0**	**30**	**700**	**3**	**2**	**8**	**2**	**37**	**1**	**1,002**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**207**				**15**				**733**				**47**			**1,002**
TRUCK PERCENTAGES																	
% Single Unit Trucks	7.1%	5.5%	6.2%		62.5%	0.0%	20.0%		3.3%	2.0%	33.3%		0.0%	0.0%	0.0%		3.4%
% Heavy Trucks	0.0%	3.5%	2.1%		0.0%	0.0%	0.0%		3.4%	0.7%	0.0%		0.0%	0.0%	0.0%		1.2%
% Trucks (Total)	**7.1%**	**9.0%**	**8.3%**		**62.5%**	**0.0%**	**20.0%**		**6.7%**	**2.7%**	**33.3%**		**0.0%**	**0.0%**	**0.0%**		**4.6%**
By Approach		**8.7%**				**40.0%**				**3.0%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.88**	**0.86**	**0.57**		**0.50**	**0.50**	**0.42**		**0.54**	**0.82**	**0.38**		**0.67**	**0.50**	**0.84**		**0.87**
By Approach		**0.81**				**0.63**				**0.84**				**0.78**			
HOURLY VOLUME-ROUNDED	**15**	**145**	**50**	**3**	**10**	**0**	**5**	**0**	**30**	**700**	**5**	**2**	**10**	**0**	**35**	**1**	**1,005**
By Approach		**210**				**15**				**735**				**45**			

P.M. PEAK Monday, June 02, 2008	↓ Fish Hatchery From North				← Nobel Drive From East				↑ Fish Hatchery From South				→ Nobel Drive From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	8	142	0	1	11	0	4	0	4	54	1	0	2	0	3	0	229
4:30 PM	5	153	5	2	10	3	8	0	0	71	1	1	1	0	7	1	264
4:45 PM	6	184	2	1	11	0	3	1	0	70	0	1	0	0	3	0	279
5:00 PM	15	212	2	2	19	1	8	0	4	54	1	0	1	0	2	0	319
Peak Hour Volume	**34**	**691**	**9**	**6**	**51**	**4**	**23**	**1**	**8**	**249**	**3**	**2**	**4**	**0**	**15**	**1**	**1,091**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**734**				**78**				**260**				**19**			**1,091**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	1.4%	22.2%		3.9%	0.0%	0.0%		12.5%	2.4%	0.0%		0.0%	0.0%	0.0%		1.9%
% Heavy Trucks	0.0%	1.2%	0.0%		0.0%	0.0%	0.0%		12.5%	0.4%	0.0%		0.0%	0.0%	0.0%		0.9%
% Trucks (Total)	**0.0%**	**2.6%**	**22.2%**		**3.9%**	**0.0%**	**0.0%**		**25.0%**	**2.8%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**2.8%**
By Approach		**2.7%**				**2.5%**				**3.5%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.57**	**0.81**	**0.45**		**0.67**	**0.33**	**0.72**		**0.50**	**0.88**	**0.75**		**0.50**	**0**	**0.54**		**0.86**
By Approach		**0.80**				**0.70**				**0.90**				**0.59**			
HOURLY VOLUME-ROUNDED	**35**	**690**	**10**	**6**	**50**	**5**	**25**	**1**	**10**	**250**	**5**	**2**	**5**	**0**	**15**	**1**	**1,100**
By Approach		**735**				**80**				**265**				**20**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Nobel
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	FISH HATCHERY From North				NOBEL DR From East				FISH HATCHERY From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	10	42	4	1	0	1	1	0	1	139	5	0	10	0	1	0	215
07:15 AM	5	28	3	1	1	1	4	0	2	164	6	1	8	0	3	1	228
07:30 AM	12	36	3	1	1	0	2	0	0	214	5	0	11	1	3	0	289
07:45 AM	21	39	4	0	3	0	1	0	0	183	14	1	8	1	1	0	276
Total	48	145	14	3	5	2	8	0	3	700	30	2	37	2	8	1	1008
08:00 AM	28	33	6	0	0	0	2	0	1	145	2	0	14	1	0	0	232
08:15 AM	14	53	4	0	3	0	2	0	1	148	3	0	4	0	1	0	233
08:30 AM	22	37	4	0	2	1	7	1	1	90	7	1	5	1	0	0	179
08:45 AM	20	37	5	0	2	0	1	0	0	79	4	0	1	1	0	0	150
Total	84	160	19	0	7	1	12	1	3	462	16	1	24	3	1	0	794
03:00 PM	0	108	6	0	2	0	7	0	0	47	2	0	4	1	0	0	177
03:15 PM	0	95	9	0	0	0	7	0	0	33	1	0	5	0	2	0	152
03:30 PM	2	104	5	1	5	0	6	0	1	55	2	0	4	0	0	0	185
03:45 PM	1	117	8	1	4	0	2	0	0	76	0	0	2	1	1	0	213
Total	3	424	28	2	11	0	22	0	1	211	5	0	15	2	3	0	727
04:00 PM	2	125	3	0	10	0	13	0	1	59	2	0	0	0	0	0	215
04:15 PM	0	142	8	1	4	0	11	0	1	54	4	0	3	0	2	0	230
04:30 PM	5	153	5	2	8	3	10	0	1	71	0	1	7	0	1	1	268
04:45 PM	2	184	6	1	3	0	11	1	0	70	0	1	3	0	0	0	282
Total	9	604	22	4	25	3	45	1	3	254	6	2	13	0	3	1	995
05:00 PM	2	212	15	2	8	1	19	0	1	54	4	0	2	0	1	0	321
05:15 PM	2	161	11	2	7	1	10	0	3	58	2	0	2	0	1	0	260
05:30 PM	1	152	11	1	3	2	4	0	2	59	0	0	5	0	1	0	241
05:45 PM	2	134	11	0	4	0	3	0	1	72	0	0	7	1	0	0	235
Total	7	659	48	5	22	4	36	0	7	243	6	0	16	1	3	0	1057
Grand Total	151	1992	131	14	70	10	123	2	17	1870	63	5	105	8	18	2	4581
Apprch %	6.6	87.1	5.7	0.6	34.1	4.9	60	1	0.9	95.7	3.2	0.3	78.9	6	13.5	1.5	
Total %	3.3	43.5	2.9	0.3	1.5	0.2	2.7	0	0.4	40.8	1.4	0.1	2.3	0.2	0.4	0	
cars	142	1920	127	4	66	10	111	1	16	1811	55	2	103	6	18	1	4393
% cars	94	96.4	96.9	28.6	94.3	100	90.2	50	94.1	96.8	87.3	40	98.1	75	100	50	95.9
Bus_Light Med Trucks	8	38	2	8	3	0	10	1	1	40	5	3	2	2	0	1	124
% Bus_Light Med Trucks	5.3	1.9	1.5	57.1	4.3	0	8.1	50	5.9	2.1	7.9	60	1.9	25	0	50	2.7
Heavy Trucks	1	34	2	2	1	0	2	0	0	19	3	0	0	0	0	0	64
% Heavy Trucks	0.7	1.7	1.5	14.3	1.4	0	1.6	0	0	1	4.8	0	0	0	0	0	1.4

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
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File Name : FishHatchery-Nobel
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Groups Printed- cars

	FISH HATCHERY From North				NOBEL DR From East				FISH HATCHERY From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	9	37	4	0	0	1	0	0	1	135	5	0	10	0	1	0	203
07:15 AM	3	27	3	0	0	1	1	0	1	158	6	0	8	0	3	0	211
07:30 AM	11	33	3	0	1	0	2	0	0	211	4	0	11	1	3	0	280
07:45 AM	21	35	3	0	3	0	0	0	0	177	13	0	8	1	1	0	262
Total	44	132	13	0	4	2	3	0	2	681	28	0	37	2	8	0	956
08:00 AM	28	29	5	0	0	0	2	0	1	144	2	0	14	1	0	0	226
08:15 AM	14	44	3	0	3	0	1	0	1	139	2	0	4	0	1	0	212
08:30 AM	21	35	4	0	2	1	6	0	1	87	6	0	4	1	0	0	168
08:45 AM	20	32	4	0	1	0	1	0	0	76	3	0	1	1	0	0	139
Total	83	140	16	0	6	1	10	0	3	446	13	0	23	3	1	0	745
03:00 PM	0	105	6	0	2	0	6	0	0	44	2	0	3	0	0	0	168
03:15 PM	0	92	9	0	0	0	7	0	0	30	1	0	5	0	2	0	146
03:30 PM	2	99	5	0	5	0	6	0	1	55	1	0	4	0	0	0	178
03:45 PM	1	116	8	0	4	0	2	0	0	73	0	0	2	0	1	0	207
Total	3	412	28	0	11	0	21	0	1	202	4	0	14	0	3	0	699
04:00 PM	1	123	3	0	10	0	11	0	1	56	2	0	0	0	0	0	207
04:15 PM	0	135	8	1	4	0	11	0	1	52	3	0	3	0	2	0	220
04:30 PM	4	151	5	1	8	3	9	0	1	68	0	1	7	0	1	1	260
04:45 PM	2	181	6	0	3	0	11	1	0	69	0	1	3	0	0	0	277
Total	7	590	22	2	25	3	42	1	3	245	5	2	13	0	3	1	964
05:00 PM	1	206	15	0	8	1	18	0	1	53	3	0	2	0	1	0	309
05:15 PM	2	156	11	1	5	1	10	0	3	55	2	0	2	0	1	0	249
05:30 PM	0	150	11	1	3	2	4	0	2	57	0	0	5	0	1	0	236
05:45 PM	2	134	11	0	4	0	3	0	1	72	0	0	7	1	0	0	235
Total	5	646	48	2	20	4	35	0	7	237	5	0	16	1	3	0	1029
Grand Total	142	1920	127	4	66	10	111	1	16	1811	55	2	103	6	18	1	4393
Apprch %	6.5	87.6	5.8	0.2	35.1	5.3	59	0.5	0.8	96.1	2.9	0.1	80.5	4.7	14.1	0.8	
Total %	3.2	43.7	2.9	0.1	1.5	0.2	2.5	0	0.4	41.2	1.3	0	2.3	0.1	0.4	0	

Traffic Analysis & Design, Inc.

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File Name : FishHatchery-Nobel
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Groups Printed- Bus_Light Med Trucks

	FISH HATCHERY From North				NOBEL DR From East				FISH HATCHERY From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	2	0	1	0	0	1	0	0	2	0	0	0	0	0	0	7
07:15 AM	2	1	0	1	1	0	3	0	1	5	0	1	0	0	0	1	16
07:30 AM	0	3	0	1	0	0	0	0	0	2	0	0	0	0	0	0	6
07:45 AM	0	2	1	0	0	0	1	0	0	5	1	1	0	0	0	0	11
Total	3	8	1	3	1	0	5	0	1	14	1	2	0	0	0	1	40
08:00 AM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
08:15 AM	0	6	0	0	0	0	0	0	0	4	1	0	0	0	0	0	11
08:30 AM	1	1	0	0	0	0	1	1	0	2	0	1	1	0	0	0	8
08:45 AM	0	3	1	0	1	0	0	0	0	3	1	0	0	0	0	0	9
Total	1	12	1	0	1	0	1	1	0	10	2	1	1	0	0	0	31
03:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	4
03:15 PM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
03:30 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
03:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3
Total	0	6	0	0	0	0	0	0	0	4	1	0	1	2	0	0	14
04:00 PM	1	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5
04:15 PM	0	3	0	0	0	0	0	0	0	2	1	0	0	0	0	0	6
04:30 PM	1	0	0	1	0	0	1	0	0	3	0	0	0	0	0	0	6
04:45 PM	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	4
Total	2	5	0	2	0	0	3	0	0	8	1	0	0	0	0	0	21
05:00 PM	1	5	0	2	0	0	1	0	0	0	0	0	0	0	0	0	9
05:15 PM	0	2	0	1	1	0	0	0	0	2	0	0	0	0	0	0	6
05:30 PM	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	2	7	0	3	1	0	1	0	0	4	0	0	0	0	0	0	18
Grand Total	8	38	2	8	3	0	10	1	1	40	5	3	2	2	0	1	124
Apprch %	14.3	67.9	3.6	14.3	21.4	0	71.4	7.1	2	81.6	10.2	6.1	40	40	0	20	
Total %	6.5	30.6	1.6	6.5	2.4	0	8.1	0.8	0.8	32.3	4	2.4	1.6	1.6	0	0.8	

Traffic Analysis & Design, Inc.

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File Name : FishHatchery-Nobel
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Groups Printed- Heavy Trucks

	FISH HATCHERY From North				NOBEL DR From East				FISH HATCHERY From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:30 AM	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
07:45 AM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Total	1	5	0	0	0	0	0	0	0	5	1	0	0	0	0	0	12
08:00 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:15 AM	0	3	1	0	0	0	1	0	0	5	0	0	0	0	0	0	10
08:30 AM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
08:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	8	2	0	0	0	1	0	0	6	1	0	0	0	0	0	18
03:00 PM	0	2	0	0	0	0	1	0	0	2	0	0	0	0	0	0	5
03:15 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
03:30 PM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
03:45 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	3
Total	0	6	0	2	0	0	1	0	0	5	0	0	0	0	0	0	14
04:00 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
04:15 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
04:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	10
05:00 PM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
05:15 PM	0	3	0	0	1	0	0	0	0	1	0	0	0	0	0	0	5
05:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	6	0	0	1	0	0	0	0	2	1	0	0	0	0	0	10
Grand Total	1	34	2	2	1	0	2	0	0	19	3	0	0	0	0	0	64
Apprch %	2.6	87.2	5.1	5.1	33.3	0	66.7	0	0	86.4	13.6	0	0	0	0	0	
Total %	1.6	53.1	3.1	3.1	1.6	0	3.1	0	0	29.7	4.7	0	0	0	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Fish Hatchery and Cheryl**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Thursday, May 29, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fish Hatchery From North				Cheryl From East				Fish Hatchery From South				Cheryl From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	6	68	25	0	9	1	2	2	10	167	2	0	3	1	24	0	318
7:15 AM	7	65	54	1	21	1	0	0	13	237	0	4	7	6	32	1	443
7:30 AM	5	67	66	0	30	1	1	0	25	300	5	1	4	2	23	2	529
7:45 AM	2	111	91	0	56	1	10	3	31	252	2	1	5	4	21	0	586
Peak Hour Volume	**20**	**311**	**236**	**1**	**116**	**4**	**13**	**5**	**79**	**956**	**9**	**6**	**19**	**13**	**100**	**3**	**1,876**
U-Turn Hourly Volume			*1*				*0*				*0*				*0*		***1***
By Approach		**567**				**133**				**1,044**				**132**			**1,876**
TRUCK PERCENTAGES																	
% Single Unit Trucks	5.0%	3.2%	1.7%		3.4%	0.0%	15.4%		0.0%	1.4%	0.0%		0.0%	0.0%	0.0%		1.8%
% Heavy Trucks	5.0%	0.7%	0.0%		0.9%	0.0%	0.0%		0.0%	0.5%	0.0%		0.0%	0.0%	0.0%		0.5%
% Trucks (Total)	**10.0%**	**3.9%**	**1.7%**		**4.3%**	**0.0%**	**15.4%**		**0.0%**	**1.9%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**2.3%**
By Approach		**3.2%**				**5.3%**				**1.7%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.71**	**0.70**	**0.65**		**0.52**	**1.00**	**0.33**		**0.64**	**0.80**	**0.45**		**0.68**	**0.54**	**0.78**		**0.80**
By Approach		**0.69**				**0.50**				**0.79**				**0.73**			
HOURLY VOLUME-ROUNDED	**20**	**310**	**235**	**1**	**115**	**5**	**15**	**5**	**80**	**955**	**10**	**6**	**20**	**15**	**100**	**3**	**1,880**
By Approach		**565**				**135**				**1,045**				**135**			

P.M. PEAK Wednesday, June 18, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fish Hatchery From North				Cheryl From East				Fish Hatchery From South				Cheryl From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	12	190	40	0	58	5	9	0	0	109	0	1	1	1	6	4	431
4:30 PM	16	225	26	0	63	6	4	0	4	129	1	3	4	0	14	2	492
4:45 PM	24	193	36	2	69	8	10	0	1	108	3	2	3	4	10	5	469
5:00 PM	22	255	49	0	89	3	13	0	1	117	0	7	4	1	6	6	560
Peak Hour Volume	**74**	**863**	**151**	**2**	**279**	**22**	**36**	**0**	**6**	**463**	**4**	**13**	**12**	**6**	**36**	**17**	**1,952**
U-Turn Hourly Volume			*6*				*0*				*0*				*0*		***6***
By Approach		**1,088**				**337**				**473**				**54**			**1,952**
TRUCK PERCENTAGES																	
% Single Unit Trucks	2.7%	1.0%	0.7%		1.8%	0.0%	0.0%		16.7%	2.2%	0.0%		8.3%	0.0%	2.8%		1.5%
% Heavy Trucks	0.0%	1.1%	0.0%		0.4%	0.0%	0.0%		0.0%	1.5%	0.0%		0.0%	0.0%	0.0%		0.9%
% Trucks (Total)	**2.7%**	**2.1%**	**0.7%**		**2.2%**	**0.0%**	**0.0%**		**16.7%**	**3.7%**	**0.0%**		**8.3%**	**0.0%**	**2.8%**		**2.4%**
By Approach		**2.0%**				**1.8%**				**3.8%**				**3.7%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.77**	**0.85**	**0.77**		**0.78**	**0.69**	**0.69**		**0.38**	**0.90**	**0.33**		**0.75**	**0.38**	**0.64**		**0.87**
By Approach		**0.83**				**0.80**				**0.88**				**0.75**			
HOURLY VOLUME-ROUNDED	**75**	**865**	**150**	**2**	**280**	**20**	**35**	**0**	**5**	**465**	**5**	**13**	**10**	**5**	**35**	**17**	**1,950**
By Approach		**1,090**				**335**				**475**				**50**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Cheryl
Site Code : 00000000
Start Date : 5/29/2008
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	25	68	6	0	2	1	9	2	2	167	10	0	24	1	3	0	320
07:15 AM	54	65	7	1	0	1	21	0	0	237	13	4	32	6	7	1	449
07:30 AM	66	67	5	0	1	1	30	0	5	300	25	1	23	2	4	2	532
07:45 AM	90	111	2	1	10	1	56	3	2	252	31	1	21	4	5	0	590
Total	235	311	20	2	13	4	116	5	9	956	79	6	100	13	19	3	1891
08:00 AM	102	89	5	0	0	0	46	1	0	200	33	1	10	2	1	0	490
08:15 AM	82	96	6	0	0	0	47	0	0	188	20	1	11	1	1	2	455
08:30 AM	63	75	3	1	0	1	30	1	1	155	16	1	12	4	2	2	367
08:45 AM	69	83	2	0	3	1	34	0	0	108	6	0	9	6	2	0	323
Total	316	343	16	1	3	2	157	2	1	651	75	3	42	13	6	4	1635
04:00 PM	27	185	21	4	7	3	67	1	4	107	8	3	3	3	2	2	447
04:15 PM	38	190	12	2	9	5	58	0	0	109	0	1	6	1	1	4	436
04:30 PM	26	225	16	0	4	6	63	0	1	129	4	3	14	0	4	2	497
04:45 PM	34	193	24	4	10	8	69	0	3	108	1	2	10	4	3	5	478
Total	125	793	73	10	30	22	257	1	8	453	13	9	33	8	10	13	1858
05:00 PM	47	255	22	2	13	3	89	0	0	117	1	7	6	1	4	6	573
05:15 PM	36	233	18	5	9	8	88	0	1	122	4	2	6	2	1	2	537
05:30 PM	37	213	14	2	3	3	61	0	3	117	4	2	8	1	2	2	472
05:45 PM	32	235	26	3	5	4	41	0	1	123	8	2	10	3	2	12	507
Total	152	936	80	12	30	18	279	0	5	479	17	13	30	7	9	22	2089
Grand Total	828	2383	189	25	76	46	809	8	23	2539	184	31	205	41	44	42	7473
Apprch %	24.2	69.6	5.5	0.7	8.1	4.9	86.2	0.9	0.8	91.4	6.6	1.1	61.7	12.3	13.3	12.7	
Total %	11.1	31.9	2.5	0.3	1	0.6	10.8	0.1	0.3	34	2.5	0.4	2.7	0.5	0.6	0.6	
cars	815	2318	184	1	74	46	791	0	23	2477	183	11	204	41	43	13	7224
% cars	98.4	97.3	97.4	4	97.4	100	97.8	0	100	97.6	99.5	35.5	99.5	100	97.7	31	96.7
Bus_Light Med Trucks	12	47	4	8	2	0	16	7	0	45	1	18	1	0	1	29	191
% Bus_Light Med Trucks	1.4	2	2.1	32	2.6	0	2	87.5	0	1.8	0.5	58.1	0.5	0	2.3	69	2.6
Heavy Trucks	1	18	1	16	0	0	2	1	0	17	0	2	0	0	0	0	58
% Heavy Trucks	0.1	0.8	0.5	64	0	0	0.2	12.5	0	0.7	0	6.5	0	0	0	0	0.8

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Cheryl
Site Code : 00000000
Start Date : 5/29/2008
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Groups Printed- cars

	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	24	63	5	0	2	1	8	0	2	163	10	0	24	1	3	0	306
07:15 AM	52	62	7	1	0	1	21	0	0	232	13	3	32	6	7	0	437
07:30 AM	65	65	4	0	1	1	28	0	5	297	25	1	23	2	4	2	523
07:45 AM	90	109	2	0	8	1	54	0	2	246	31	1	21	4	5	0	574
Total	231	299	18	1	11	4	111	0	9	938	79	5	100	13	19	2	1840
08:00 AM	101	87	5	0	0	0	46	0	0	198	33	0	10	2	1	0	483
08:15 AM	78	89	6	0	0	0	45	0	0	181	20	1	11	1	1	0	433
08:30 AM	63	73	3	0	0	1	30	0	1	153	16	1	12	4	2	2	361
08:45 AM	67	75	2	0	3	1	34	0	0	106	6	0	9	6	2	0	311
Total	309	324	16	0	3	2	155	0	1	638	75	2	42	13	6	2	1588
04:00 PM	27	178	20	0	7	3	65	0	4	105	8	0	3	3	2	0	425
04:15 PM	38	185	11	0	9	5	55	0	0	101	0	0	6	1	1	0	412
04:30 PM	26	221	16	0	4	6	61	0	1	126	3	2	13	0	3	0	482
04:45 PM	33	191	24	0	10	8	68	0	3	106	1	0	10	4	3	0	461
Total	124	775	71	0	30	22	249	0	8	438	12	2	32	8	9	0	1780
05:00 PM	47	248	21	0	13	3	89	0	0	113	1	1	6	1	4	4	551
05:15 PM	36	231	18	0	9	8	87	0	1	115	4	0	6	2	1	0	518
05:30 PM	36	209	14	0	3	3	60	0	3	113	4	1	8	1	2	1	458
05:45 PM	32	232	26	0	5	4	40	0	1	122	8	0	10	3	2	4	489
Total	151	920	79	0	30	18	276	0	5	463	17	2	30	7	9	9	2016
Grand Total	815	2318	184	1	74	46	791	0	23	2477	183	11	204	41	43	13	7224
Apprch %	24.6	69.9	5.5	0	8.1	5	86.8	0	0.9	91.9	6.8	0.4	67.8	13.6	14.3	4.3	
Total %	11.3	32.1	2.5	0	1	0.6	10.9	0	0.3	34.3	2.5	0.2	2.8	0.6	0.6	0.2	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Cheryl
Site Code : 00000000
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Groups Printed- Bus_Light Med Trucks

	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	5	1	0	0	0	0	2	0	2	0	0	0	0	0	0	11
07:15 AM	2	3	0	0	0	0	0	0	0	4	0	1	0	0	0	1	11
07:30 AM	1	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	4
07:45 AM	0	2	0	0	2	0	2	3	0	6	0	0	0	0	0	0	15
Total	4	10	1	0	2	0	4	5	0	13	0	1	0	0	0	1	41
08:00 AM	1	2	0	0	0	0	0	1	0	2	0	1	0	0	0	0	7
08:15 AM	4	6	0	0	0	0	2	0	0	5	0	0	0	0	0	2	19
08:30 AM	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
08:45 AM	1	6	0	0	0	0	0	0	0	2	0	0	0	0	0	0	9
Total	6	16	0	0	0	0	2	1	0	11	0	1	0	0	0	2	39
04:00 PM	0	5	1	2	0	0	2	1	0	1	0	3	0	0	0	2	17
04:15 PM	0	2	1	0	0	0	3	0	0	5	0	1	0	0	0	4	16
04:30 PM	0	2	0	0	0	0	1	0	0	2	1	1	1	0	1	2	11
04:45 PM	1	1	0	2	0	0	1	0	0	1	0	2	0	0	0	5	13
Total	1	10	2	4	0	0	7	1	0	9	1	7	1	0	1	13	57
05:00 PM	0	4	1	0	0	0	0	0	0	2	0	6	0	0	0	2	15
05:15 PM	0	1	0	3	0	0	1	0	0	6	0	1	0	0	0	2	14
05:30 PM	1	3	0	0	0	0	1	0	0	3	0	1	0	0	0	1	10
05:45 PM	0	3	0	1	0	0	1	0	0	1	0	1	0	0	0	8	15
Total	1	11	1	4	0	0	3	0	0	12	0	9	0	0	0	13	54
Grand Total	12	47	4	8	2	0	16	7	0	45	1	18	1	0	1	29	191
Apprch %	16.9	66.2	5.6	11.3	8	0	64	28	0	70.3	1.6	28.1	3.2	0	3.2	93.5	
Total %	6.3	24.6	2.1	4.2	1	0	8.4	3.7	0	23.6	0.5	9.4	0.5	0	0.5	15.2	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Cheryl
Site Code : 00000000
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Groups Printed- Heavy Trucks

	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:30 AM	0	2	1	0	0	0	0	0	0	2	0	0	0	0	0	0	5
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	1	1	0	0	1	0	0	5	0	0	0	0	0	0	10
08:15 AM	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3
08:30 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
08:45 AM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	1	3	0	1	0	0	0	1	0	2	0	0	0	0	0	0	8
04:00 PM	0	2	0	2	0	0	0	0	0	1	0	0	0	0	0	0	5
04:15 PM	0	3	0	2	0	0	0	0	0	3	0	0	0	0	0	0	8
04:30 PM	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4
04:45 PM	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0	0	4
Total	0	8	0	6	0	0	1	0	0	6	0	0	0	0	0	0	21
05:00 PM	0	3	0	2	0	0	0	0	0	2	0	0	0	0	0	0	7
05:15 PM	0	1	0	2	0	0	0	0	0	1	0	1	0	0	0	0	5
05:30 PM	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0	0	4
05:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3
Total	0	5	0	8	0	0	0	0	0	4	0	2	0	0	0	0	19
Grand Total	1	18	1	16	0	0	2	1	0	17	0	2	0	0	0	0	58
Apprch %	2.8	50	2.8	44.4	0	0	66.7	33.3	0	89.5	0	10.5	0	0	0	0	
Total %	1.7	31	1.7	27.6	0	0	3.4	1.7	0	29.3	0	3.4	0	0	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **East Hill Drive and Irish Lane**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Wednesday, June 11, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	East Hill Drive From North				Irish Lane From East				East Hill Drive From South				Irish Lane From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	0	0	0	0	0	17	0	0	4	0	2	0	0	18	0	0	41
7:15 AM	0	0	0	0	0	17	0	0	1	0	1	0	0	18	0	0	37
7:30 AM	0	0	0	0	0	25	0	0	4	0	1	0	0	35	0	0	65
7:45 AM	0	0	0	0	0	20	1	0	2	0	0	0	1	29	0	0	53
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**79**	**1**	**0**	**11**	**0**	**4**	**0**	**1**	**100**	**0**	**0**	**196**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**80**				**15**				**101**			**196**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.3%	0.0%		0.0%	0.0%	0.0%		0.0%	2.0%	0.0%		1.5%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.2%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.5%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.5%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.0%**	**0.0%**		**2.0%**
By Approach		**0.0%**				**2.5%**				**0.0%**				**2.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.79**	**0.25**		**0.69**	**0**	**0.50**		**0.25**	**0.71**	**0**		**0.75**
By Approach		**0**				**0.80**				**0.63**				**0.72**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**80**	**0**	**0**	**10**	**0**	**5**	**0**	**0**	**100**	**0**	**0**	**195**
By Approach		**0**				**80**				**15**				**100**			

P.M. PEAK Wednesday, June 04, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	East Hill Drive From North				Irish Lane From East				East Hill Drive From South				Irish Lane From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	0	0	0	0	0	24	2	0	0	0	1	0	1	25	0	0	53
4:30 PM	0	0	0	2	0	28	6	0	0	0	0	0	1	21	0	0	56
4:45 PM	0	0	0	1	0	30	5	0	2	0	0	0	1	19	0	0	57
5:00 PM	0	0	0	0	0	38	1	0	1	0	0	4	1	25	0	0	66
Peak Hour Volume	**0**	**0**	**0**	**3**	**0**	**120**	**14**	**0**	**3**	**0**	**1**	**4**	**4**	**90**	**0**	**0**	**232**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**134**				**4**				**94**			**232**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.7%	0.0%		0.0%	0.0%	0.0%		0.0%	4.4%	0.0%		2.6%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**1.7%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**4.4%**	**0.0%**		**2.6%**
By Approach		**0.0%**				**1.5%**				**0.0%**				**4.2%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.79**	**0.58**		**0.38**	**0**	**0.25**		**1.00**	**0.90**	**0**		**0.88**
By Approach		**0**				**0.86**				**0.50**				**0.90**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**3**	**0**	**120**	**15**	**0**	**5**	**0**	**0**	**4**	**5**	**90**	**0**	**0**	**235**
By Approach		**0**				**135**				**5**				**95**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-EastHill
Site Code : 00000000
Start Date : 6/11/2008
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	E HILL DR From North				IRISH LN From East				E HILL DR From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	17	0	0	2	0	4	0	0	18	0	0	41
07:15 AM	0	0	0	0	0	17	0	0	1	0	1	0	0	18	0	0	37
07:30 AM	0	0	0	0	0	25	0	0	1	0	4	0	0	35	0	0	65
07:45 AM	0	0	0	0	1	20	0	0	0	0	2	0	0	29	1	0	53
Total	0	0	0	0	1	79	0	0	4	0	11	0	0	100	1	0	196
08:00 AM	0	0	0	0	1	11	0	0	0	0	2	0	0	22	0	0	36
08:15 AM	0	0	0	0	1	16	0	0	0	0	1	0	0	21	1	0	40
08:30 AM	0	0	0	0	0	14	0	0	0	0	0	0	0	9	0	0	23
08:45 AM	0	0	0	0	1	11	0	0	1	0	1	0	0	8	0	0	22
Total	0	0	0	0	3	52	0	0	1	0	4	0	0	60	1	0	121
04:00 PM	0	0	0	0	1	19	0	0	2	0	0	0	0	12	0	0	34
04:15 PM	0	0	0	0	2	24	0	0	1	0	0	0	0	25	1	0	53
04:30 PM	0	0	0	2	6	28	0	0	0	0	0	0	0	21	1	0	58
04:45 PM	0	0	0	1	5	30	0	0	0	0	2	0	0	19	1	0	58
Total	0	0	0	3	14	101	0	0	3	0	2	0	0	77	3	0	203
05:00 PM	0	0	0	0	1	38	0	0	0	0	1	4	0	25	1	0	70
05:15 PM	0	0	0	0	1	33	0	0	0	0	0	0	0	18	0	0	52
05:30 PM	0	0	0	1	5	31	0	0	0	0	2	0	0	25	2	0	66
05:45 PM	0	0	0	0	1	21	0	0	0	0	1	2	0	11	0	0	36
Total	0	0	0	1	8	123	0	0	0	0	4	6	0	79	3	0	224
Grand Total	0	0	0	4	26	355	0	0	8	0	21	6	0	316	8	0	744
Apprch %	0	0	0	100	6.8	93.2	0	0	22.9	0	60	17.1	0	97.5	2.5	0	
Total %	0	0	0	0.5	3.5	47.7	0	0	1.1	0	2.8	0.8	0	42.5	1.1	0	
cars	0	0	0	0	26	348	0	0	7	0	21	0	0	304	7	0	713
% cars	0	0	0	0	100	98	0	0	87.5	0	100	0	0	96.2	87.5	0	95.8
Bus_Light Med Trucks	0	0	0	4	0	6	0	0	1	0	0	6	0	10	1	0	28
% Bus_Light Med Trucks	0	0	0	100	0	1.7	0	0	12.5	0	0	100	0	3.2	12.5	0	3.8
Heavy Trucks	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
% Heavy Trucks	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0.6	0	0	0.4

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-EastHill
Site Code : 00000000
Start Date : 6/11/2008
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Groups Printed- cars

	E HILL DR From North				IRISH LN From East				E HILL DR From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	17	0	0	2	0	4	0	0	17	0	0	40
07:15 AM	0	0	0	0	0	16	0	0	1	0	1	0	0	18	0	0	36
07:30 AM	0	0	0	0	0	24	0	0	1	0	4	0	0	34	0	0	63
07:45 AM	0	0	0	0	1	20	0	0	0	0	2	0	0	29	1	0	53
Total	0	0	0	0	1	77	0	0	4	0	11	0	0	98	1	0	192
08:00 AM	0	0	0	0	1	11	0	0	0	0	2	0	0	21	0	0	35
08:15 AM	0	0	0	0	1	16	0	0	0	0	1	0	0	19	0	0	37
08:30 AM	0	0	0	0	0	14	0	0	0	0	0	0	0	8	0	0	22
08:45 AM	0	0	0	0	1	10	0	0	1	0	1	0	0	8	0	0	21
Total	0	0	0	0	3	51	0	0	1	0	4	0	0	56	0	0	115
04:00 PM	0	0	0	0	1	19	0	0	1	0	0	0	0	11	0	0	32
04:15 PM	0	0	0	0	2	24	0	0	1	0	0	0	0	25	1	0	53
04:30 PM	0	0	0	0	6	27	0	0	0	0	0	0	0	20	1	0	54
04:45 PM	0	0	0	0	5	30	0	0	0	0	2	0	0	19	1	0	57
Total	0	0	0	0	14	100	0	0	2	0	2	0	0	75	3	0	196
05:00 PM	0	0	0	0	1	37	0	0	0	0	1	0	0	22	1	0	62
05:15 PM	0	0	0	0	1	32	0	0	0	0	0	0	0	18	0	0	51
05:30 PM	0	0	0	0	5	30	0	0	0	0	2	0	0	24	2	0	63
05:45 PM	0	0	0	0	1	21	0	0	0	0	1	0	0	11	0	0	34
Total	0	0	0	0	8	120	0	0	0	0	4	0	0	75	3	0	210
Grand Total	0	0	0	0	26	348	0	0	7	0	21	0	0	304	7	0	713
Apprch %	0	0	0	0	7	93	0	0	25	0	75	0	0	97.7	2.3	0	
Total %	0	0	0	0	3.6	48.8	0	0	1	0	2.9	0	0	42.6	1	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-EastHill
Site Code : 00000000
Start Date : 6/11/2008
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Groups Printed- Bus_Light Med Trucks

	E HILL DR From North				IRISH LN From East				E HILL DR From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0	4
04:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
04:30 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	4
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	3	0	1	0	0	1	0	0	0	0	2	0	0	7
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	4	0	3	0	0	8
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Total	0	0	0	1	0	3	0	0	0	0	0	6	0	4	0	0	14
Grand Total	0	0	0	4	0	6	0	0	1	0	0	6	0	10	1	0	28
Apprch %	0	0	0	100	0	100	0	0	14.3	0	0	85.7	0	90.9	9.1	0	
Total %	0	0	0	14.3	0	21.4	0	0	3.6	0	0	21.4	0	35.7	3.6	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-EastHill
Site Code : 00000000
Start Date : 6/11/2008
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Groups Printed- Heavy Trucks

	E HILL DR From North				IRISH LN From East				E HILL DR From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Grand Total	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	33.3	0	0	0	0	0	0	0	66.7	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Syene Road and Irish Lane**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Friday, June 06, 2008	↓ Syene Road From North				← Irish Lane From East				↑ Syene Road From South				→ Irish Lane From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	6	3	1	0	3	10	0	0	0	17	1	0	1	5	12	0	59
7:15 AM	1	3	6	0	3	10	0	0	0	29	2	0	1	11	18	0	84
7:30 AM	5	7	3	0	5	9	1	0	0	25	1	0	0	9	17	0	82
7:45 AM	6	8	0	0	5	14	1	0	1	30	5	0	0	10	29	0	109
Peak Hour Volume	**18**	**21**	**10**	**0**	**16**	**43**	**2**	**0**	**1**	**101**	**9**	**0**	**2**	**35**	**76**	**0**	**334**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**49**				**61**				**111**				**113**			**334**
TRUCK PERCENTAGES																	
% Single Unit Trucks	11.1%	14.3%	10.0%		12.5%	0.0%	50.0%		0.0%	3.0%	0.0%		50.0%	0.0%	2.6%		4.5%
% Heavy Trucks	0.0%	4.7%	0.0%		0.0%	0.0%	0.0%		0.0%	1.0%	0.0%		0.0%	0.0%	0.0%		0.6%
% Trucks (Total)	**11.1%**	**19.0%**	**10.0%**		**12.5%**	**0.0%**	**50.0%**		**0.0%**	**4.0%**	**0.0%**		**50.0%**	**0.0%**	**2.6%**		**5.1%**
By Approach		**14.3%**				**4.9%**				**3.6%**				**2.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.75**	**0.66**	**0.42**		**0.80**	**0.77**	**0.50**		**0.25**	**0.84**	**0.45**		**0.50**	**0.80**	**0.66**		**0.77**
By Approach		**0.82**				**0.76**				**0.77**				**0.72**			
HOURLY VOLUME-ROUNDED	**20**	**20**	**10**	**0**	**15**	**45**	**0**	**0**	**0**	**100**	**10**	**0**	**0**	**35**	**75**	**0**	**330**
By Approach		**50**				**60**				**110**				**110**			

P.M. PEAK Thursday, June 05, 2008	↓ Syene Road From North				← Irish Lane From East				↑ Syene Road From South				→ Irish Lane From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	14	13	5	0	0	7	2	0	0	6	2	0	2	7	1	0	59
4:30 PM	26	24	4	0	1	8	1	0	0	5	1	0	3	6	4	0	83
4:45 PM	24	26	4	0	4	11	0	0	0	6	1	0	2	10	6	0	94
5:00 PM	20	40	9	0	2	7	0	0	0	9	0	0	6	15	1	0	109
Peak Hour Volume	**84**	**103**	**22**	**0**	**7**	**33**	**3**	**0**	**0**	**26**	**4**	**0**	**13**	**38**	**12**	**0**	**345**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**209**				**43**				**30**				**63**			**345**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	9.1%		0.0%	3.0%	0.0%		0.0%	0.0%	0.0%		0.0%	5.3%	8.3%		1.7%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%
% Trucks (Total)	**0.0%**	**0.0%**	**9.1%**		**0.0%**	**3.0%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**5.3%**	**8.3%**		**1.7%**
By Approach		**1.0%**				**2.3%**				**0.0%**				**4.8%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.81**	**0.64**	**0.61**		**0.44**	**0.75**	**0.38**		**0**	**0.72**	**0.50**		**0.54**	**0.63**	**0.50**		**0.79**
By Approach		**0.76**				**0.72**				**0.83**				**0.72**			
HOURLY VOLUME-ROUNDED	**85**	**105**	**20**	**0**	**5**	**35**	**5**	**0**	**0**	**25**	**5**	**0**	**15**	**40**	**10**	**0**	**350**
By Approach		**210**				**45**				**30**				**65**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-Syene
Site Code : 00000000
Start Date : 6/6/2008
Page No : 1

Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	SYENE RD From North				IRISH LN From East				SYENE RD From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	3	6	0	0	10	3	0	1	17	0	0	12	5	1	0	59
07:15 AM	6	3	1	0	0	10	3	0	2	29	0	0	18	11	1	0	84
07:30 AM	3	7	5	0	1	9	5	0	1	25	0	0	17	9	0	0	82
07:45 AM	0	8	6	0	1	14	5	0	5	30	1	0	29	10	0	0	109
Total	10	21	18	0	2	43	16	0	9	101	1	0	76	35	2	0	334
08:00 AM	3	2	2	0	2	13	12	0	0	10	0	0	14	1	0	0	59
08:15 AM	0	1	4	0	0	11	0	2	0	11	0	0	16	4	0	0	49
08:30 AM	2	4	1	0	0	10	3	0	0	16	0	0	14	4	0	0	54
08:45 AM	2	7	4	0	0	6	1	0	1	5	0	0	8	3	0	0	37
Total	7	14	11	0	2	40	16	2	1	42	0	0	52	12	0	0	199
04:00 PM	3	18	17	0	1	5	3	0	0	4	0	0	4	8	0	3	66
04:15 PM	5	13	14	0	2	7	0	0	2	6	0	0	1	7	2	0	59
04:30 PM	4	24	26	0	1	8	1	0	1	5	0	0	4	6	3	0	83
04:45 PM	4	26	24	0	0	11	4	0	1	6	0	0	6	10	2	0	94
Total	16	81	81	0	4	31	8	0	4	21	0	0	15	31	7	3	302
05:00 PM	9	40	20	0	0	7	2	0	0	9	0	0	1	15	6	0	109
05:15 PM	6	25	28	0	0	10	2	2	3	5	1	0	5	10	0	0	97
05:30 PM	2	23	20	0	0	6	1	0	0	4	0	0	5	9	5	0	75
05:45 PM	1	21	17	0	0	3	2	0	2	8	0	0	4	13	2	0	73
Total	18	109	85	0	0	26	7	2	5	26	1	0	15	47	13	0	354
Grand Total	51	225	195	0	8	140	47	4	19	190	2	0	158	125	22	3	1189
Apprch %	10.8	47.8	41.4	0	4	70.4	23.6	2	9	90	0.9	0	51.3	40.6	7.1	1	
Total %	4.3	18.9	16.4	0	0.7	11.8	4	0.3	1.6	16	0.2	0	13.3	10.5	1.9	0.3	
cars	47	218	192	0	7	139	45	2	19	186	2	0	153	120	21	1	1152
% cars	92.2	96.9	98.5	0	87.5	99.3	95.7	50	100	97.9	100	0	96.8	96	95.5	33.3	96.9
Bus_Light Med Trucks	4	6	3	0	1	1	2	2	0	3	0	0	5	5	1	2	35
% Bus_Light Med Trucks	7.8	2.7	1.5	0	12.5	0.7	4.3	50	0	1.6	0	0	3.2	4	4.5	66.7	2.9
Heavy Trucks	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
% Heavy Trucks	0	0.4	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0.2

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-Syene
Site Code : 00000000
Start Date : 6/6/2008
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Groups Printed- cars

	SYENE RD From North				IRISH LN From East				SYENE RD From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	2	4	0	0	10	2	0	1	16	0	0	12	5	0	0	53
07:15 AM	6	2	1	0	0	10	3	0	2	28	0	0	17	11	1	0	81
07:30 AM	2	7	5	0	0	9	5	0	1	24	0	0	17	9	0	0	79
07:45 AM	0	6	6	0	1	14	4	0	5	29	1	0	28	10	0	0	104
Total	9	17	16	0	1	43	14	0	9	97	1	0	74	35	1	0	317
08:00 AM	3	2	2	0	2	13	12	0	0	10	0	0	13	1	0	0	58
08:15 AM	0	1	4	0	0	11	0	2	0	11	0	0	16	4	0	0	49
08:30 AM	2	3	1	0	0	10	3	0	0	16	0	0	14	3	0	0	52
08:45 AM	2	7	4	0	0	6	1	0	1	5	0	0	8	2	0	0	36
Total	7	13	11	0	2	40	16	2	1	42	0	0	51	10	0	0	195
04:00 PM	3	17	17	0	1	5	3	0	0	4	0	0	3	8	0	1	62
04:15 PM	3	13	14	0	2	7	0	0	2	6	0	0	1	7	2	0	57
04:30 PM	4	24	26	0	1	8	1	0	1	5	0	0	4	5	3	0	82
04:45 PM	4	26	24	0	0	10	4	0	1	6	0	0	5	10	2	0	92
Total	14	80	81	0	4	30	8	0	4	21	0	0	13	30	7	1	293
05:00 PM	9	40	20	0	0	7	2	0	0	9	0	0	1	14	6	0	108
05:15 PM	6	25	27	0	0	10	2	0	3	5	1	0	5	10	0	0	94
05:30 PM	2	22	20	0	0	6	1	0	0	4	0	0	5	9	5	0	74
05:45 PM	0	21	17	0	0	3	2	0	2	8	0	0	4	12	2	0	71
Total	17	108	84	0	0	26	7	0	5	26	1	0	15	45	13	0	347
Grand Total	47	218	192	0	7	139	45	2	19	186	2	0	153	120	21	1	1152
Apprch %	10.3	47.7	42	0	3.6	72	23.3	1	9.2	89.9	1	0	51.9	40.7	7.1	0.3	
Total %	4.1	18.9	16.7	0	0.6	12.1	3.9	0.2	1.6	16.1	0.2	0	13.3	10.4	1.8	0.1	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-Syene
Site Code : 00000000
Start Date : 6/6/2008
Page No : 1

Groups Printed- Bus_Light Med Trucks

	SYENE RD From North				IRISH LN From East				SYENE RD From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	1	2	0	0	0	1	0	0	1	0	0	0	0	1	0	6
07:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
07:30 AM	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3
07:45 AM	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	4
Total	1	3	2	0	1	0	2	0	0	3	0	0	2	0	1	0	15
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	4
04:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	4
04:15 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Total	2	1	0	0	0	1	0	0	0	0	0	0	2	1	0	2	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:15 PM	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	3
05:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Total	1	1	1	0	0	0	0	2	0	0	0	0	0	2	0	0	7
Grand Total	4	6	3	0	1	1	2	2	0	3	0	0	5	5	1	2	35
Apprch %	30.8	46.2	23.1	0	16.7	16.7	33.3	33.3	0	100	0	0	38.5	38.5	7.7	15.4	
Total %	11.4	17.1	8.6	0	2.9	2.9	5.7	5.7	0	8.6	0	0	14.3	14.3	2.9	5.7	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Irish-Syene
Site Code : 00000000
Start Date : 6/6/2008
Page No : 1

Groups Printed- Heavy Trucks

	SYENE RD From North				IRISH LN From East				SYENE RD From South				IRISH LN From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Grand Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Apprch %	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
Total %	0	50	0	0	0	0	0	0	0	50	0	0	0	0	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Fahey Glen and Lacy Road**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Tuesday, June 10, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fahey Glen From North				Lacy Road From East				Fahey Glen From South				Lacy Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	0	0	0	0	0	36	0	0	2	0	1	0	2	40	0	0	81
7:15 AM	0	0	0	0	0	55	0	0	0	0	2	0	1	47	0	0	105
7:30 AM	0	0	0	0	0	77	2	0	3	0	1	0	0	47	0	0	130
7:45 AM	0	0	0	0	0	78	3	0	3	0	1	0	2	51	0	0	138
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**246**	**5**	**0**	**8**	**0**	**5**	**0**	**5**	**185**	**0**	**0**	**454**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**251**				**13**				**190**			**454**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	3.7%	20.0%		12.5%	0.0%	0.0%		0.0%	0.5%	0.0%		2.6%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.2%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.7%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**4.9%**	**20.0%**		**12.5%**	**0.0%**	**0.0%**		**0.0%**	**0.5%**	**0.0%**		**3.3%**
By Approach		**0.0%**				**5.2%**				**7.7%**				**0.5%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.79**	**0.42**		**0.67**	**0**	**0.63**		**0.62**	**0.91**	**0**		**0.82**
By Approach		**0**				**0.77**				**0.81**				**0.90**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**245**	**5**	**0**	**10**	**0**	**5**	**0**	**5**	**185**	**0**	**0**	**455**
By Approach		**0**				**250**				**15**				**190**			

P.M. PEAK Thursday, June 05, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Fahey Glen From North				Lacy Road From East				Fahey Glen From South				Lacy Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	0	0	0	0	0	37	4	0	1	0	1	0	1	54	0	0	98
4:30 PM	0	0	0	0	0	43	0	0	0	0	0	0	1	64	0	0	108
4:45 PM	0	0	0	0	0	74	1	0	2	0	1	0	1	60	0	0	139
5:00 PM	0	0	0	0	0	74	0	0	1	0	3	0	4	84	0	0	166
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**228**	**5**	**0**	**4**	**0**	**5**	**0**	**7**	**262**	**0**	**0**	**511**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**233**				**9**				**269**			**511**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	3.1%	0.0%		0.0%	0.0%	0.0%		0.0%	3.4%	0.0%		3.1%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**3.1%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**3.4%**	**0.0%**		**3.1%**
By Approach		**0.0%**				**3.0%**				**0.0%**				**3.3%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.77**	**0.31**		**0.50**	**0**	**0.42**		**0.44**	**0.78**	**0**		**0.77**
By Approach		**0**				**0.78**				**0.56**				**0.76**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**230**	**5**	**0**	**5**	**0**	**5**	**0**	**5**	**260**	**0**	**0**	**510**
By Approach		**0**				**235**				**10**				**265**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-FaheyGlen
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	36	0	0	1	0	2	0	0	40	2	0	81
07:15 AM	0	0	0	0	0	55	0	0	2	0	0	0	0	47	1	0	105
07:30 AM	0	0	0	0	2	77	0	0	1	0	3	0	0	47	0	0	130
07:45 AM	0	0	0	0	3	78	0	0	1	0	3	0	0	51	2	0	138
Total	0	0	0	0	5	246	0	0	5	0	8	0	0	185	5	0	454
08:00 AM	0	0	0	0	0	70	0	0	4	0	2	1	0	33	0	0	110
08:15 AM	0	0	0	0	0	47	0	0	0	0	0	0	0	39	0	0	86
08:30 AM	0	0	0	0	0	33	0	0	5	0	1	0	0	30	1	0	70
08:45 AM	0	0	0	0	0	33	0	0	0	0	0	0	0	24	1	0	58
Total	0	0	0	0	0	183	0	0	9	0	3	1	0	126	2	0	324
04:00 PM	0	0	0	0	2	34	0	0	0	0	2	0	0	53	5	0	96
04:15 PM	0	0	0	0	4	37	0	0	1	0	1	0	0	54	1	0	98
04:30 PM	0	0	0	0	0	43	0	0	0	0	0	0	0	64	1	0	108
04:45 PM	0	0	0	0	1	74	0	0	1	0	2	0	0	60	1	0	139
Total	0	0	0	0	7	188	0	0	2	0	5	0	0	231	8	0	441
05:00 PM	0	0	0	0	0	74	0	0	3	0	1	0	0	84	4	0	166
05:15 PM	0	0	0	3	1	76	0	0	2	0	0	0	0	56	2	0	140
05:30 PM	0	0	0	2	0	60	0	0	0	0	3	0	0	50	2	0	117
05:45 PM	0	0	0	2	0	35	0	0	2	0	1	0	0	45	0	0	85
Total	0	0	0	7	1	245	0	0	7	0	5	0	0	235	8	0	508
Grand Total	0	0	0	7	13	862	0	0	23	0	21	1	0	777	23	0	1727
Apprch %	0	0	0	100	1.5	98.5	0	0	51.1	0	46.7	2.2	0	97.1	2.9	0	
Total %	0	0	0	0.4	0.8	49.9	0	0	1.3	0	1.2	0.1	0	45	1.3	0	
cars	0	0	0	0	12	827	0	0	23	0	19	0	0	759	22	0	1662
% cars	0	0	0	0	92.3	95.9	0	0	100	0	90.5	0	0	97.7	95.7	0	96.2
Bus_Light Med Trucks	0	0	0	7	1	27	0	0	0	0	2	1	0	15	1	0	54
% Bus_Light Med Trucks	0	0	0	100	7.7	3.1	0	0	0	0	9.5	100	0	1.9	4.3	0	3.1
Heavy Trucks	0	0	0	0	0	8	0	0	0	0	0	0	0	3	0	0	11
% Heavy Trucks	0	0	0	0	0	0.9	0	0	0	0	0	0	0	0.4	0	0	0.6

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-FaheyGlen
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- cars

	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	34	0	0	1	0	2	0	0	40	2	0	79
07:15 AM	0	0	0	0	0	54	0	0	2	0	0	0	0	46	1	0	103
07:30 AM	0	0	0	0	1	72	0	0	1	0	2	0	0	47	0	0	123
07:45 AM	0	0	0	0	3	74	0	0	1	0	3	0	0	51	2	0	134
Total	0	0	0	0	4	234	0	0	5	0	7	0	0	184	5	0	439
08:00 AM	0	0	0	0	0	65	0	0	4	0	2	0	0	31	0	0	102
08:15 AM	0	0	0	0	0	44	0	0	0	0	0	0	0	39	0	0	83
08:30 AM	0	0	0	0	0	30	0	0	5	0	1	0	0	27	1	0	64
08:45 AM	0	0	0	0	0	30	0	0	0	0	0	0	0	23	1	0	54
Total	0	0	0	0	0	169	0	0	9	0	3	0	0	120	2	0	303
04:00 PM	0	0	0	0	2	32	0	0	0	0	1	0	0	51	4	0	90
04:15 PM	0	0	0	0	4	36	0	0	1	0	1	0	0	51	1	0	94
04:30 PM	0	0	0	0	0	42	0	0	0	0	0	0	0	62	1	0	105
04:45 PM	0	0	0	0	1	70	0	0	1	0	2	0	0	57	1	0	132
Total	0	0	0	0	7	180	0	0	2	0	4	0	0	221	7	0	421
05:00 PM	0	0	0	0	0	73	0	0	3	0	1	0	0	83	4	0	164
05:15 PM	0	0	0	0	1	76	0	0	2	0	0	0	0	56	2	0	137
05:30 PM	0	0	0	0	0	60	0	0	0	0	3	0	0	50	2	0	115
05:45 PM	0	0	0	0	0	35	0	0	2	0	1	0	0	45	0	0	83
Total	0	0	0	0	1	244	0	0	7	0	5	0	0	234	8	0	499
Grand Total	0	0	0	0	12	827	0	0	23	0	19	0	0	759	22	0	1662
Apprch %	0	0	0	0	1.4	98.6	0	0	54.8	0	45.2	0	0	97.2	2.8	0	
Total %	0	0	0	0	0.7	49.8	0	0	1.4	0	1.1	0	0	45.7	1.3	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-FaheyGlen
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- Bus_Light Med Trucks

	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
07:30 AM	0	0	0	0	1	4	0	0	0	0	1	0	0	0	0	0	6
07:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	1	9	0	0	0	0	1	0	0	1	0	0	12
08:00 AM	0	0	0	0	0	4	0	0	0	0	0	1	0	2	0	0	7
08:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	9	0	0	0	0	0	1	0	4	0	0	14
04:00 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	1	1	0	5
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
04:45 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	7
Total	0	0	0	0	0	8	0	0	0	0	1	0	0	9	1	0	19
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	7	0	1	0	0	0	0	0	0	0	1	0	0	9
Grand Total	0	0	0	7	1	27	0	0	0	0	2	1	0	15	1	0	54
Apprch %	0	0	0	100	3.6	96.4	0	0	0	0	66.7	33.3	0	93.8	6.2	0	
Total %	0	0	0	13	1.9	50	0	0	0	0	3.7	1.9	0	27.8	1.9	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-FaheyGlen
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- Heavy Trucks

	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
08:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Total	0	0	0	0	0	5	0	0	0	0	0	0	0	2	0	0	7
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	8	0	0	0	0	0	0	0	3	0	0	11
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	72.7	0	0	0	0	0	0	0	27.3	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Mica Road and Lacy Road**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Tuesday, June 10, 2008	↓ Mica Road From North				← Lacy Road From East				↑ Mica Road From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	0	0	0	0	0	36	0	0	6	0	8	0	2	36	0	0	88
7:15 AM	0	0	0	0	0	61	0	0	10	0	3	0	1	34	0	0	109
7:30 AM	0	0	0	0	0	71	0	0	6	0	6	0	0	42	0	0	125
7:45 AM	0	0	0	1	0	78	0	1	5	0	5	0	1	47	0	0	136
Peak Hour Volume	**0**	**0**	**0**	**1**	**0**	**246**	**0**	**1**	**27**	**0**	**22**	**0**	**4**	**159**	**0**	**0**	**458**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**246**				**49**				**163**			**458**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	3.7%	0.0%		0.0%	0.0%	4.5%		0.0%	0.0%	0.0%		2.2%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.2%	0.0%		0.0%	0.0%	4.6%		0.0%	0.0%	0.0%		0.9%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**4.9%**	**0.0%**		**0.0%**	**0.0%**	**9.1%**		**0.0%**	**0.0%**	**0.0%**		**3.1%**
By Approach		**0.0%**				**4.9%**				**4.1%**				**0.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.79**	**0**		**0.68**	**0**	**0.69**		**0.50**	**0.85**	**0**		**0.84**
By Approach		**0**				**0.79**				**0.87**				**0.85**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**1**	**0**	**245**	**0**	**1**	**25**	**0**	**20**	**0**	**5**	**160**	**0**	**0**	**455**
By Approach		**0**				**245**				**45**				**165**			

P.M. PEAK Tuesday, June 10, 2008	↓ Mica Road From North				← Lacy Road From East				↑ Mica Road From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	0	0	0	0	0	44	3	0	4	0	1	0	3	59	0	0	114
4:30 PM	0	0	0	0	0	62	1	0	3	0	3	0	5	58	0	0	132
4:45 PM	0	0	0	0	0	56	7	0	0	0	1	1	4	53	0	0	121
5:00 PM	0	0	0	0	0	68	5	0	1	0	3	1	6	85	0	0	168
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**230**	**16**	**0**	**8**	**0**	**8**	**2**	**18**	**255**	**0**	**0**	**535**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**246**				**16**				**273**			**535**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.3%	0.0%		0.0%	0.0%	0.0%		0.0%	2.0%	0.0%		1.5%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.7%	0.0%		0.4%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**1.3%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.7%**	**0.0%**		**1.9%**
By Approach		**0.0%**				**1.2%**				**0.0%**				**2.5%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.85**	**0.57**		**0.50**	**0**	**0.67**		**0.75**	**0.75**	**0**		**0.80**
By Approach		**0**				**0.84**				**0.67**				**0.75**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**230**	**15**	**0**	**10**	**0**	**10**	**2**	**20**	**255**	**0**	**0**	**540**
By Approach		**0**				**245**				**20**				**275**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Mica
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	36	0	0	8	0	6	0	0	36	2	0	88
07:15 AM	0	0	0	0	0	61	0	0	3	0	10	0	0	34	1	0	109
07:30 AM	0	0	0	0	0	71	0	0	6	0	6	0	0	42	0	0	125
07:45 AM	0	0	0	1	0	78	0	1	5	0	5	0	0	47	1	0	138
Total	0	0	0	1	0	246	0	1	22	0	27	0	0	159	4	0	460
08:00 AM	0	0	0	1	1	70	0	1	5	0	2	0	0	34	1	0	115
08:15 AM	0	0	0	0	0	47	0	0	1	0	4	1	0	37	2	0	92
08:30 AM	0	0	0	0	5	32	0	0	3	0	3	0	0	28	0	0	71
08:45 AM	0	0	0	0	0	30	1	0	3	0	1	0	0	24	0	0	59
Total	0	0	0	1	6	179	1	1	12	0	10	1	0	123	3	0	337
04:00 PM	0	0	0	1	5	30	0	0	4	0	2	0	0	68	4	0	114
04:15 PM	0	0	0	0	3	44	0	0	1	0	4	0	0	59	3	0	114
04:30 PM	0	0	0	0	1	62	0	0	3	0	3	0	0	58	5	0	132
04:45 PM	0	0	0	0	7	56	0	0	1	0	0	1	0	53	4	0	122
Total	0	0	0	1	16	192	0	0	9	0	9	1	0	238	16	0	482
05:00 PM	0	0	0	0	5	68	0	0	3	0	1	1	0	85	6	0	169
05:15 PM	0	0	0	2	7	84	0	0	1	0	3	0	0	68	10	0	175
05:30 PM	0	0	0	0	3	65	0	0	0	0	4	0	0	53	9	0	134
05:45 PM	0	0	0	0	5	34	0	0	1	0	2	2	0	66	3	0	113
Total	0	0	0	2	20	251	0	0	5	0	10	3	0	272	28	0	591
Grand Total	0	0	0	5	42	868	1	2	48	0	56	5	0	792	51	0	1870
Apprch %	0	0	0	100	4.6	95.1	0.1	0.2	44	0	51.4	4.6	0	94	6	0	
Total %	0	0	0	0.3	2.2	46.4	0.1	0.1	2.6	0	3	0.3	0	42.4	2.7	0	
cars	0	0	0	1	42	837	1	0	46	0	56	2	0	776	51	0	1812
% cars	0	0	0	20	100	96.4	100	0	95.8	0	100	40	0	98	100	0	96.9
Bus_Light Med Trucks	0	0	0	4	0	22	0	2	1	0	0	3	0	11	0	0	43
% Bus_Light Med Trucks	0	0	0	80	0	2.5	0	100	2.1	0	0	60	0	1.4	0	0	2.3
Heavy Trucks	0	0	0	0	0	9	0	0	1	0	0	0	0	5	0	0	15
% Heavy Trucks	0	0	0	0	0	1	0	0	2.1	0	0	0	0	0.6	0	0	0.8

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Mica
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- cars

	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	34	0	0	7	0	6	0	0	36	2	0	85
07:15 AM	0	0	0	0	0	60	0	0	2	0	10	0	0	34	1	0	107
07:30 AM	0	0	0	0	0	66	0	0	6	0	6	0	0	42	0	0	120
07:45 AM	0	0	0	0	0	74	0	0	5	0	5	0	0	47	1	0	132
Total	0	0	0	0	0	234	0	0	20	0	27	0	0	159	4	0	444
08:00 AM	0	0	0	0	1	67	0	0	5	0	2	0	0	33	1	0	109
08:15 AM	0	0	0	0	0	45	0	0	1	0	4	1	0	37	2	0	90
08:30 AM	0	0	0	0	5	28	0	0	3	0	3	0	0	25	0	0	64
08:45 AM	0	0	0	0	0	27	1	0	3	0	1	0	0	23	0	0	55
Total	0	0	0	0	6	167	1	0	12	0	10	1	0	118	3	0	318
04:00 PM	0	0	0	1	5	28	0	0	4	0	2	0	0	65	4	0	109
04:15 PM	0	0	0	0	3	43	0	0	1	0	4	0	0	56	3	0	110
04:30 PM	0	0	0	0	1	60	0	0	3	0	3	0	0	57	5	0	129
04:45 PM	0	0	0	0	7	56	0	0	1	0	0	0	0	52	4	0	120
Total	0	0	0	1	16	187	0	0	9	0	9	0	0	230	16	0	468
05:00 PM	0	0	0	0	5	68	0	0	3	0	1	0	0	83	6	0	166
05:15 PM	0	0	0	0	7	84	0	0	1	0	3	0	0	67	10	0	172
05:30 PM	0	0	0	0	3	65	0	0	0	0	4	0	0	53	9	0	134
05:45 PM	0	0	0	0	5	32	0	0	1	0	2	1	0	66	3	0	110
Total	0	0	0	0	20	249	0	0	5	0	10	1	0	269	28	0	582
Grand Total	0	0	0	1	42	837	1	0	46	0	56	2	0	776	51	0	1812
Apprch %	0	0	0	100	4.8	95.1	0.1	0	44.2	0	53.8	1.9	0	93.8	6.2	0	
Total %	0	0	0	0.1	2.3	46.2	0.1	0	2.5	0	3.1	0.1	0	42.8	2.8	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Mica
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- Bus_Light Med Trucks

	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
07:45 AM	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	4
Total	0	0	0	1	0	9	0	1	1	0	0	0	0	0	0	0	12
08:00 AM	0	0	0	1	0	2	0	1	0	0	0	0	0	1	0	0	5
08:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	5
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	6	0	1	0	0	0	0	0	3	0	0	11
04:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	5
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
04:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2
Total	0	0	0	0	0	5	0	0	0	0	0	1	0	6	0	0	12
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	3
05:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	3
Total	0	0	0	2	0	2	0	0	0	0	0	2	0	2	0	0	8
Grand Total	0	0	0	4	0	22	0	2	1	0	0	3	0	11	0	0	43
Apprch %	0	0	0	100	0	91.7	0	8.3	25	0	0	75	0	100	0	0	
Total %	0	0	0	9.3	0	51.2	0	4.7	2.3	0	0	7	0	25.6	0	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Mica
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- Heavy Trucks

	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
08:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Total	0	0	0	0	0	6	0	0	0	0	0	0	0	2	0	0	8
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	9	0	0	1	0	0	0	0	5	0	0	15
Apprch %	0	0	0	0	0	100	0	0	100	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	60	0	0	6.7	0	0	0	0	33.3	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Syene Road and Lacy Road**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Wednesday, June 04, 2008	↓ Syene Road From North				← Lacy Road From East				↑ Syene Road From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	9	7	2	0	7	24	0	0	1	42	3	0	1	15	30	0	141
7:15 AM	17	6	3	1	14	32	0	0	0	51	2	0	0	9	43	0	177
7:30 AM	18	12	3	0	15	35	2	0	1	51	2	0	0	17	50	0	206
7:45 AM	21	8	4	0	17	52	0	0	1	62	0	0	0	13	44	0	222
Peak Hour Volume	**65**	**33**	**12**	**1**	**53**	**143**	**2**	**0**	**3**	**206**	**7**	**0**	**1**	**54**	**167**	**0**	**746**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**110**				**198**				**216**				**222**			**746**
TRUCK PERCENTAGES																	
% Single Unit Trucks	4.6%	6.1%	8.3%		5.7%	5.6%	0.0%		0.0%	2.9%	14.3%		0.0%	5.6%	3.6%		4.4%
% Heavy Trucks	0.0%	3.0%	8.4%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.3%
% Trucks (Total)	**4.6%**	**9.1%**	**16.7%**		**5.7%**	**5.6%**	**0.0%**		**0.0%**	**2.9%**	**14.3%**		**0.0%**	**5.6%**	**3.6%**		**4.7%**
By Approach		**7.3%**				**5.6%**				**3.2%**				**4.1%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.77**	**0.69**	**0.75**		**0.78**	**0.69**	**0.25**		**0.75**	**0.83**	**0.58**		**0.25**	**0.79**	**0.84**		**0.84**
By Approach		**0.83**				**0.72**				**0.86**				**0.83**			
HOURLY VOLUME-ROUNDED	**65**	**35**	**10**	**1**	**55**	**145**	**0**	**0**	**5**	**205**	**5**	**0**	**0**	**55**	**165**	**0**	**745**
By Approach		**110**				**200**				**215**				**220**			

P.M. PEAK Thursday, June 12, 2008	↓ Syene Road From North				← Lacy Road From East				↑ Syene Road From South				→ Lacy Road From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	34	41	9	0	8	16	0	0	0	5	3	0	2	25	16	0	159
4:30 PM	52	43	15	0	1	14	0	1	0	13	1	0	7	38	16	1	200
4:45 PM	47	61	17	0	8	18	1	0	0	11	2	0	7	24	13	0	209
5:00 PM	65	74	20	0	6	17	2	0	1	12	1	2	2	55	19	4	274
Peak Hour Volume	**198**	**219**	**61**	**0**	**23**	**65**	**3**	**1**	**1**	**41**	**7**	**2**	**18**	**142**	**64**	**5**	**842**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**478**				**91**				**49**				**224**			**842**
TRUCK PERCENTAGES																	
% Single Unit Trucks	3.5%	1.4%	1.6%		0.0%	0.0%	0.0%		0.0%	2.4%	28.6%		16.7%	1.4%	1.6%		2.4%
% Heavy Trucks	0.5%	0.0%	0.0%		0.0%	4.6%	0.0%		0.0%	0.0%	0.0%		0.0%	0.7%	1.5%		0.7%
% Trucks (Total)	**4.0%**	**1.4%**	**1.6%**		**0.0%**	**4.6%**	**0.0%**		**0.0%**	**2.4%**	**28.6%**		**16.7%**	**2.1%**	**3.1%**		**3.1%**
By Approach		**2.5%**				**3.3%**				**6.1%**				**3.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.76**	**0.74**	**0.76**		**0.72**	**0.90**	**0.38**		**0.25**	**0.79**	**0.58**		**0.64**	**0.65**	**0.84**		**0.77**
By Approach		**0.75**				**0.84**				**0.88**				**0.74**			
HOURLY VOLUME-ROUNDED	**200**	**220**	**60**	**0**	**25**	**65**	**5**	**1**	**0**	**40**	**5**	**2**	**20**	**140**	**65**	**5**	**845**
By Approach		**480**				**95**				**45**				**225**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Syene
Site Code : 00000000
Start Date : 6/12/2008
Page No : 1

Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	SYENE RD From North				LACY RD From East				SYENE RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	7	9	0	0	24	7	0	3	42	1	0	30	15	1	0	141
07:15 AM	3	6	17	1	0	32	14	0	2	51	0	0	43	9	0	0	178
07:30 AM	3	12	18	0	2	35	15	0	2	51	1	0	50	17	0	0	206
07:45 AM	4	8	21	0	0	52	17	0	0	62	1	0	44	13	0	0	222
Total	12	33	65	1	2	143	53	0	7	206	3	0	167	54	1	0	747
08:00 AM	2	6	13	0	0	21	11	0	1	38	1	0	49	13	1	0	156
08:15 AM	5	10	15	0	0	31	14	0	3	27	0	0	30	11	1	0	147
08:30 AM	3	10	17	0	1	13	7	0	0	33	2	0	30	15	2	0	133
08:45 AM	2	8	12	0	0	17	14	0	2	20	1	0	16	5	0	0	97
Total	12	34	57	0	1	82	46	0	6	118	4	0	125	44	4	0	533
04:00 PM	14	40	21	0	2	10	3	0	1	7	1	2	17	28	2	0	148
04:15 PM	9	41	34	0	0	16	8	0	3	5	0	0	16	25	2	0	159
04:30 PM	15	43	52	0	0	14	1	1	1	13	0	0	16	38	7	1	202
04:45 PM	17	61	47	0	1	18	8	0	2	11	0	0	13	24	7	0	209
Total	55	185	154	0	3	58	20	1	7	36	1	2	62	115	18	1	718
05:00 PM	20	74	65	0	2	17	6	0	1	12	1	2	19	55	2	4	280
05:15 PM	14	55	70	1	0	24	4	0	4	11	0	0	31	32	0	1	247
05:30 PM	17	53	53	1	2	25	4	0	6	16	0	1	21	26	3	1	229
05:45 PM	6	23	35	0	2	12	7	1	0	14	0	0	22	26	3	1	152
Total	57	205	223	2	6	78	21	1	11	53	1	3	93	139	8	7	908
Grand Total	136	457	499	3	12	361	140	2	31	413	9	5	447	352	31	8	2906
Apprch %	12.4	41.7	45.6	0.3	2.3	70.1	27.2	0.4	6.8	90.2	2	1.1	53.3	42	3.7	1	
Total %	4.7	15.7	17.2	0.1	0.4	12.4	4.8	0.1	1.1	14.2	0.3	0.2	15.4	12.1	1.1	0.3	
cars	130	447	482	2	11	347	134	0	26	402	9	2	434	342	27	0	2795
% cars	95.6	97.8	96.6	66.7	91.7	96.1	95.7	0	83.9	97.3	100	40	97.1	97.2	87.1	0	96.2
Bus_Light Med Trucks	4	9	14	1	0	10	6	2	5	10	0	3	10	6	4	8	92
% Bus_Light Med Trucks	2.9	2	2.8	33.3	0	2.8	4.3	100	16.1	2.4	0	60	2.2	1.7	12.9	100	3.2
Heavy Trucks	2	1	3	0	1	4	0	0	0	1	0	0	3	4	0	0	19
% Heavy Trucks	1.5	0.2	0.6	0	8.3	1.1	0	0	0	0.2	0	0	0.7	1.1	0	0	0.7

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Syene
Site Code : 00000000
Start Date : 6/12/2008
Page No : 1

Groups Printed- cars

	SYENE RD From North				LACY RD From East				SYENE RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	5	9	0	0	23	7	0	2	41	1	0	27	15	1	0	133
07:15 AM	1	5	17	0	0	30	11	0	2	51	0	0	42	9	0	0	168
07:30 AM	3	12	18	0	2	34	15	0	2	47	1	0	49	15	0	0	198
07:45 AM	4	8	18	0	0	48	17	0	0	61	1	0	43	12	0	0	212
Total	10	30	62	0	2	135	50	0	6	200	3	0	161	51	1	0	711
08:00 AM	2	6	13	0	0	21	11	0	1	38	1	0	49	13	1	0	156
08:15 AM	3	10	14	0	0	31	11	0	3	26	0	0	30	10	1	0	139
08:30 AM	3	10	17	0	0	12	7	0	0	32	2	0	28	14	2	0	127
08:45 AM	2	8	10	0	0	17	14	0	2	19	1	0	14	5	0	0	92
Total	10	34	54	0	0	81	43	0	6	115	4	0	121	42	4	0	514
04:00 PM	13	38	21	0	2	9	3	0	0	7	1	2	17	27	1	0	141
04:15 PM	9	41	32	0	0	15	8	0	1	5	0	0	15	24	2	0	152
04:30 PM	14	42	51	0	0	14	1	0	1	13	0	0	15	38	7	0	196
04:45 PM	17	59	46	0	1	18	8	0	2	11	0	0	13	23	4	0	202
Total	53	180	150	0	3	56	20	0	4	36	1	2	60	112	14	0	691
05:00 PM	20	74	61	0	2	15	6	0	1	11	1	0	19	54	2	0	266
05:15 PM	14	54	68	1	0	24	4	0	4	11	0	0	31	31	0	0	242
05:30 PM	17	52	52	1	2	24	4	0	5	16	0	0	21	26	3	0	223
05:45 PM	6	23	35	0	2	12	7	0	0	13	0	0	21	26	3	0	148
Total	57	203	216	2	6	75	21	0	10	51	1	0	92	137	8	0	879
Grand Total	130	447	482	2	11	347	134	0	26	402	9	2	434	342	27	0	2795
Apprch %	12.3	42.1	45.4	0.2	2.2	70.5	27.2	0	5.9	91.6	2.1	0.5	54	42.6	3.4	0	
Total %	4.7	16	17.2	0.1	0.4	12.4	4.8	0	0.9	14.4	0.3	0.1	15.5	12.2	1	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Syene
Site Code : 00000000
Start Date : 6/12/2008
Page No : 1

Groups Printed- Bus_Light Med Trucks

	SYENE RD From North				LACY RD From East				SYENE RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	2	0	0	0	1	0	0	1	1	0	0	3	0	0	0	8
07:15 AM	1	0	0	1	0	2	3	0	0	0	0	0	1	0	0	0	8
07:30 AM	0	0	0	0	0	1	0	0	0	4	0	0	1	2	0	0	8
07:45 AM	0	0	3	0	0	4	0	0	0	1	0	0	1	1	0	0	10
Total	1	2	3	1	0	8	3	0	1	6	0	0	6	3	0	0	34
08:15 AM	1	0	1	0	0	0	3	0	0	1	0	0	0	1	0	0	7
08:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	3
08:45 AM	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	3
Total	1	0	2	0	0	1	3	0	0	3	0	0	2	1	0	0	13
04:00 PM	1	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	5
04:15 PM	0	0	2	0	0	0	0	0	2	0	0	0	0	1	0	0	5
04:30 PM	1	1	1	0	0	0	0	1	0	0	0	0	1	0	0	1	6
04:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3	0	6
Total	2	5	4	0	0	0	0	1	3	0	0	0	1	1	4	1	22
05:00 PM	0	0	3	0	0	0	0	0	0	1	0	2	0	1	0	4	11
05:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3
05:30 PM	0	1	1	0	0	1	0	0	1	0	0	1	0	0	0	1	6
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	3
Total	0	2	5	0	0	1	0	1	1	1	0	3	1	1	0	7	23
Grand Total	4	9	14	1	0	10	6	2	5	10	0	3	10	6	4	8	92
Apprch %	14.3	32.1	50	3.6	0	55.6	33.3	11.1	27.8	55.6	0	16.7	35.7	21.4	14.3	28.6	
Total %	4.3	9.8	15.2	1.1	0	10.9	6.5	2.2	5.4	10.9	0	3.3	10.9	6.5	4.3	8.7	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : Lacy-Syene
Site Code : 00000000
Start Date : 6/12/2008
Page No : 1

Groups Printed- Heavy Trucks

	SYENE RD From North				LACY RD From East				SYENE RD From South				LACY RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	3
08:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Total	1	0	1	0	1	0	0	0	0	0	0	0	2	1	0	0	6
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	2	0	0	0	0	0	0	1	2	0	0	5
05:00 PM	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	2	0	0	2	0	0	0	1	0	0	0	1	0	0	6
Grand Total	2	1	3	0	1	4	0	0	0	1	0	0	3	4	0	0	19
Apprch %	33.3	16.7	50	0	20	80	0	0	0	100	0	0	42.9	57.1	0	0	
Total %	10.5	5.3	15.8	0	5.3	21.1	0	0	0	5.3	0	0	15.8	21.1	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Research Park and Cheryl**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Friday, May 30, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Research Park From North				Cheryl From East				Research Park From South				Cheryl From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	1	1	1	0	1	14	2	0	6	1	2	1	2	28	4	0	63
7:15 AM	0	1	0	0	3	19	2	0	3	4	0	1	4	41	9	0	86
7:30 AM	5	2	1	1	3	25	5	0	3	1	1	1	1	43	16	0	106
7:45 AM	6	0	0	0	2	24	1	0	10	7	2	1	2	70	27	0	151
Peak Hour Volume	**12**	**4**	**2**	**1**	**9**	**82**	**10**	**0**	**22**	**13**	**5**	**4**	**9**	**182**	**56**	**0**	**406**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**18**				**101**				**40**				**247**			**406**
TRUCK PERCENTAGES																	
% Single Unit Trucks	8.3%	50.0%	0.0%		11.1%	3.7%	0.0%		0.0%	0.0%	0.0%		0.0%	2.2%	0.0%		2.7%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.5%	0.0%		0.2%
% Trucks (Total)	**8.3%**	**50.0%**	**0.0%**		**11.1%**	**3.7%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.7%**	**0.0%**		**3.0%**
By Approach		**16.6%**				**4.0%**				**0.0%**				**2.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.50**	**0.50**	**0.50**		**0.75**	**0.82**	**0.50**		**0.55**	**0.46**	**0.63**		**0.56**	**0.65**	**0.52**		**0.67**
By Approach		**0.56**				**0.77**				**0.53**				**0.62**			
HOURLY VOLUME-ROUNDED	**10**	**5**	**0**	**1**	**10**	**80**	**10**	**0**	**20**	**15**	**5**	**4**	**10**	**180**	**55**	**0**	**400**
By Approach		**15**				**100**				**40**				**245**			

P.M. PEAK Tuesday, May 27, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Research Park From North				Cheryl From East				Research Park From South				Cheryl From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	10	4	3	0	1	44	4	0	3	2	2	1	3	25	8	0	109
4:30 PM	17	13	2	2	0	42	14	0	3	0	5	5	0	28	7	0	131
4:45 PM	15	6	6	0	0	58	10	0	2	1	7	0	2	28	13	0	148
5:00 PM	21	11	7	0	1	74	15	1	5	0	6	0	2	27	11	1	180
Peak Hour Volume	**63**	**34**	**18**	**2**	**2**	**218**	**43**	**1**	**13**	**3**	**20**	**6**	**7**	**108**	**39**	**1**	**568**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**115**				**263**				**36**				**154**			**568**
TRUCK PERCENTAGES																	
% Single Unit Trucks	3.2%	0.0%	5.6%		0.0%	0.9%	0.0%		23.1%	0.0%	0.0%		0.0%	1.9%	0.0%		1.8%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.9%	0.0%		0.0%	0.0%	0.0%		0.0%	0.9%	0.0%		0.5%
% Trucks (Total)	**3.2%**	**0.0%**	**5.6%**		**0.0%**	**1.8%**	**0.0%**		**23.1%**	**0.0%**	**0.0%**		**0.0%**	**2.8%**	**0.0%**		**2.3%**
By Approach		**2.6%**				**1.5%**				**8.3%**				**2.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.75**	**0.65**	**0.64**		**0.50**	**0.74**	**0.72**		**0.65**	**0.38**	**0.71**		**0.58**	**0.96**	**0.75**		**0.79**
By Approach		**0.74**				**0.73**				**0.82**				**0.90**			
HOURLY VOLUME-ROUNDED	**65**	**35**	**20**	**2**	**0**	**220**	**45**	**1**	**15**	**5**	**20**	**6**	**5**	**110**	**40**	**1**	**580**
By Approach		**120**				**265**				**40**				**155**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Cheryl
Site Code : 00000000
Start Date : 5/30/2008
Page No : 1

Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	RESEARCH PARK From North				CHERYL From East				RESEARCH PARK From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	1	1	0	2	14	1	0	2	1	6	1	4	28	2	0	64
07:15 AM	0	1	0	0	2	19	3	0	0	4	3	1	9	41	4	0	87
07:30 AM	1	2	5	1	5	25	3	0	1	1	3	1	16	43	1	0	108
07:45 AM	0	0	6	0	1	24	2	0	2	7	10	1	27	70	2	0	152
Total	2	4	12	1	10	82	9	0	5	13	22	4	56	182	9	0	411
08:00 AM	0	3	12	0	1	21	4	0	1	3	7	0	28	61	2	0	143
08:15 AM	0	4	9	0	7	27	5	0	1	7	10	0	20	53	2	0	145
08:30 AM	1	2	8	0	2	23	7	0	3	3	9	0	14	53	3	0	128
08:45 AM	0	1	6	0	0	18	3	0	1	3	3	0	8	42	7	0	92
Total	1	10	35	0	10	89	19	0	6	16	29	0	70	209	14	0	508
04:00 PM	4	3	13	0	17	46	0	2	10	2	2	1	5	25	3	0	133
04:15 PM	3	4	10	0	4	44	1	0	2	2	3	1	8	25	3	0	110
04:30 PM	2	13	17	2	14	42	0	0	5	0	3	5	7	28	0	0	138
04:45 PM	6	6	15	0	10	58	0	0	7	1	2	0	13	28	2	0	148
Total	15	26	55	2	45	190	1	2	24	5	10	7	33	106	8	0	529
05:00 PM	7	11	21	0	15	74	1	1	6	0	5	0	11	27	2	1	182
05:15 PM	3	8	16	0	16	64	1	4	4	0	3	2	8	40	2	0	171
05:30 PM	2	7	17	1	7	61	0	0	5	1	4	4	8	27	0	0	144
05:45 PM	0	4	17	0	3	56	1	0	1	0	3	5	4	37	7	2	140
Total	12	30	71	1	41	255	3	5	16	1	15	11	31	131	11	3	637
Grand Total	30	70	173	4	106	616	32	7	51	35	76	22	190	628	42	3	2085
Apprch %	10.8	25.3	62.5	1.4	13.9	80.9	4.2	0.9	27.7	19	41.3	12	22	72.8	4.9	0.3	
Total %	1.4	3.4	8.3	0.2	5.1	29.5	1.5	0.3	2.4	1.7	3.6	1.1	9.1	30.1	2	0.1	
cars	29	67	167	1	105	604	30	5	51	34	71	12	189	614	42	3	2024
% cars	96.7	95.7	96.5	25	99.1	98.1	93.8	71.4	100	97.1	93.4	54.5	99.5	97.8	100	100	97.1
Bus_Light Med Trucks	1	3	5	3	1	8	2	2	0	0	4	10	1	10	0	0	50
% Bus_Light Med Trucks	3.3	4.3	2.9	75	0.9	1.3	6.2	28.6	0	0	5.3	45.5	0.5	1.6	0	0	2.4
Heavy Trucks	0	0	1	0	0	4	0	0	0	1	1	0	0	4	0	0	11
% Heavy Trucks	0	0	0.6	0	0	0.6	0	0	0	2.9	1.3	0	0	0.6	0	0	0.5

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Cheryl
Site Code : 00000000
Start Date : 5/30/2008
Page No : 1

Groups Printed- cars

	RESEARCH PARK From North				CHERYL From East				RESEARCH PARK From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	0	1	0	2	13	1	0	2	1	6	0	4	27	2	0	60
07:15 AM	0	1	0	0	2	18	3	0	0	4	3	0	9	40	4	0	84
07:30 AM	1	1	4	0	5	25	2	0	1	1	3	0	16	41	1	0	101
07:45 AM	0	0	6	0	1	23	2	0	2	7	10	0	27	69	2	0	149
Total	2	2	11	0	10	79	8	0	5	13	22	0	56	177	9	0	394
08:00 AM	0	2	12	0	1	20	4	0	1	3	7	0	28	59	2	0	139
08:15 AM	0	4	9	0	6	26	5	0	1	7	10	0	20	53	2	0	143
08:30 AM	1	2	8	0	2	22	6	0	3	3	8	0	13	51	3	0	122
08:45 AM	0	1	5	0	0	17	3	0	1	3	3	0	8	41	7	0	89
Total	1	9	34	0	9	85	18	0	6	16	28	0	69	204	14	0	493
04:00 PM	4	3	13	0	17	46	0	0	10	1	2	1	5	24	3	0	129
04:15 PM	3	4	9	0	4	43	1	0	2	2	2	1	8	25	3	0	107
04:30 PM	2	13	17	1	14	42	0	0	5	0	2	3	7	26	0	0	132
04:45 PM	5	6	14	0	10	56	0	0	7	1	2	0	13	28	2	0	144
Total	14	26	53	1	45	187	1	0	24	4	8	5	33	103	8	0	512
05:00 PM	7	11	21	0	15	73	1	1	6	0	4	0	11	26	2	1	179
05:15 PM	3	8	15	0	16	63	1	4	4	0	3	1	8	40	2	0	168
05:30 PM	2	7	17	0	7	61	0	0	5	1	3	2	8	27	0	0	140
05:45 PM	0	4	16	0	3	56	1	0	1	0	3	4	4	37	7	2	138
Total	12	30	69	0	41	253	3	5	16	1	13	7	31	130	11	3	625
Grand Total	29	67	167	1	105	604	30	5	51	34	71	12	189	614	42	3	2024
Apprch %	11	25.4	63.3	0.4	14.1	81.2	4	0.7	30.4	20.2	42.3	7.1	22.3	72.4	5	0.4	
Total %	1.4	3.3	8.3	0	5.2	29.8	1.5	0.2	2.5	1.7	3.5	0.6	9.3	30.3	2.1	0.1	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Cheryl
Site Code : 00000000
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Groups Printed- Bus_Light Med Trucks

	RESEARCH PARK From North				CHERYL From East				RESEARCH PARK From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0	4
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	3
07:30 AM	0	1	1	1	0	0	1	0	0	0	0	1	0	2	0	0	7
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	2	1	1	0	3	1	0	0	0	0	4	0	4	0	0	16
08:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	4
08:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	4
Total	0	1	0	0	1	2	1	0	0	0	0	0	1	3	0	0	9
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	3
04:15 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
04:30 PM	0	0	0	1	0	0	0	0	0	0	1	2	0	1	0	0	5
04:45 PM	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	1	0	2	1	0	1	0	2	0	0	2	2	0	2	0	0	13
05:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	3
05:15 PM	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	3
05:30 PM	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	4
05:45 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Total	0	0	2	1	0	2	0	0	0	0	2	4	0	1	0	0	12
Grand Total	1	3	5	3	1	8	2	2	0	0	4	10	1	10	0	0	50
Apprch %	8.3	25	41.7	25	7.7	61.5	15.4	15.4	0	0	28.6	71.4	9.1	90.9	0	0	
Total %	2	6	10	6	2	16	4	4	0	0	8	20	2	20	0	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Cheryl
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Groups Printed- Heavy Trucks

	RESEARCH PARK From North				CHERYL From East				RESEARCH PARK From South				CHERYL From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
08:45 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	3
Total	0	0	1	0	0	2	0	0	0	0	1	0	0	2	0	0	6
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0	4
Grand Total	0	0	1	0	0	4	0	0	0	1	1	0	0	4	0	0	11
Apprch %	0	0	100	0	0	100	0	0	0	50	50	0	0	100	0	0	
Total %	0	0	9.1	0	0	36.4	0	0	0	9.1	9.1	0	0	36.4	0	0	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Research Park and Lacy**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Friday, May 30, 2008	↓ Research Park From North				← Lacy From East				↑ Research Park From South				→ Lacy From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	1	2	0	0	2	36	9	0	3	1	6	2	14	34	6	0	114
7:15 AM	1	0	0	0	1	29	13	0	3	1	8	3	17	46	6	0	125
7:30 AM	2	2	0	0	4	41	17	0	5	3	8	0	16	52	6	0	156
7:45 AM	2	0	3	1	5	48	15	0	4	14	10	2	20	79	11	0	211
Peak Hour Volume	**6**	**4**	**3**	**1**	**12**	**154**	**54**	**0**	**15**	**19**	**32**	**7**	**67**	**211**	**29**	**0**	**606**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**13**				**220**				**66**				**307**			**606**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	25.0%	0.0%		8.3%	1.9%	5.6%		0.0%	0.0%	0.0%		1.5%	1.4%	0.0%		2.0%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	5.3%	0.0%		0.0%	1.4%	0.0%		0.7%
% Trucks (Total)	**0.0%**	**25.0%**	**0.0%**		**8.3%**	**1.9%**	**5.6%**		**0.0%**	**5.3%**	**0.0%**		**1.5%**	**2.8%**	**0.0%**		**2.6%**
By Approach		**7.7%**				**3.2%**				**1.5%**				**2.3%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.75**	**0.50**	**0.25**		**0.60**	**0.80**	**0.79**		**0.75**	**0.34**	**0.80**		**0.84**	**0.67**	**0.66**		**0.72**
By Approach		**0.65**				**0.81**				**0.59**				**0.70**			
HOURLY VOLUME-ROUNDED	**5**	**5**	**5**	**1**	**10**	**155**	**55**	**0**	**15**	**20**	**30**	**7**	**65**	**210**	**30**	**0**	**605**
By Approach		**15**				**220**				**65**				**305**			

P.M. PEAK Monday, June 09, 2008	↓ Research Park From North				← Lacy From East				↑ Research Park From South				→ Lacy From West				**Total Vehicle Volumes**
TRAFFIC VOLUMES																	
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	10	2	0	0	0	37	1	0	3	0	9	0	8	52	3	0	125
4:30 PM	21	2	2	0	0	49	2	0	10	3	4	0	11	45	1	0	150
4:45 PM	14	2	4	0	0	52	6	0	3	2	15	0	11	69	4	0	182
5:00 PM	27	3	4	2	2	71	5	2	20	3	22	4	19	82	1	0	259
Peak Hour Volume	**72**	**9**	**10**	**2**	**2**	**209**	**14**	**2**	**36**	**8**	**50**	**4**	**49**	**248**	**9**	**0**	**716**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**91**				**225**				**94**				**306**			**716**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	11.1%	0.0%		0.0%	1.9%	0.0%		0.0%	37.5%	0.0%		6.1%	1.2%	0.0%		2.0%
% Heavy Trucks	1.4%	0.0%	0.0%		0.0%	1.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.4%	0.0%		0.6%
% Trucks (Total)	**1.4%**	**11.1%**	**0.0%**		**0.0%**	**2.9%**	**0.0%**		**0.0%**	**37.5%**	**0.0%**		**6.1%**	**1.6%**	**0.0%**		**2.5%**
By Approach		**2.2%**				**2.7%**				**3.2%**				**2.3%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.67**	**0.75**	**0.63**		**0.25**	**0.74**	**0.58**		**0.45**	**0.67**	**0.57**		**0.64**	**0.76**	**0.56**		**0.69**
By Approach		**0.67**				**0.72**				**0.52**				**0.75**			
HOURLY VOLUME-ROUNDED	**70**	**10**	**10**	**2**	**0**	**210**	**15**	**2**	**35**	**10**	**50**	**4**	**50**	**250**	**10**	**0**	**720**
By Approach		**90**				**225**				**95**				**310**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
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File Name : ResearchPk-Lacy
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	RESEARCH PARK From North				LACY From East				RESEARCH PARK From South				LACY From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	2	1	0	9	36	2	0	6	1	3	2	6	34	14	0	116
07:15 AM	0	0	1	0	13	29	1	0	8	1	3	3	6	46	17	0	128
07:30 AM	0	2	2	0	17	41	4	0	8	3	5	0	6	52	16	0	156
07:45 AM	3	0	2	1	15	48	5	0	10	14	4	2	11	79	20	0	214
Total	3	4	6	1	54	154	12	0	32	19	15	7	29	211	67	0	614
08:00 AM	0	1	2	1	9	55	4	0	3	3	1	0	5	44	13	0	141
08:15 AM	2	7	7	0	9	41	7	0	15	8	4	3	9	33	13	0	158
08:30 AM	0	1	3	0	7	44	1	0	9	1	3	0	12	35	15	0	131
08:45 AM	0	0	4	0	7	34	1	0	6	2	1	0	5	30	6	0	96
Total	2	9	16	1	32	174	13	0	33	14	9	3	31	142	47	0	526
04:00 PM	3	0	11	0	1	29	1	0	7	2	9	0	3	67	12	0	145
04:15 PM	0	2	10	0	1	37	0	0	9	0	3	0	3	52	8	0	125
04:30 PM	2	2	21	0	2	49	0	0	4	3	10	0	1	45	11	0	150
04:45 PM	4	2	14	0	6	52	0	0	15	2	3	0	4	69	11	0	182
Total	9	6	56	0	10	167	1	0	35	7	25	0	11	233	42	0	602
05:00 PM	4	3	27	2	5	71	2	2	22	3	20	4	1	82	19	0	267
05:15 PM	2	3	16	0	1	71	1	2	9	0	3	1	1	65	17	1	193
05:30 PM	1	1	8	2	2	53	0	1	6	2	4	0	6	57	19	2	164
05:45 PM	3	2	8	2	5	43	0	4	10	1	1	5	3	57	15	0	159
Total	10	9	59	6	13	238	3	9	47	6	28	10	11	261	70	3	783
Grand Total	24	28	137	8	109	733	29	9	147	46	77	20	82	847	226	3	2525
Apprch %	12.2	14.2	69.5	4.1	12.4	83.3	3.3	1	50.7	15.9	26.6	6.9	7.1	73.1	19.5	0.3	
Total %	1	1.1	5.4	0.3	4.3	29	1.1	0.4	5.8	1.8	3	0.8	3.2	33.5	9	0.1	
cars	24	25	135	2	106	716	28	6	147	40	77	13	80	829	221	1	2450
% cars	100	89.3	98.5	25	97.2	97.7	96.6	66.7	100	87	100	65	97.6	97.9	97.8	33.3	97
Bus_Light Med Trucks	0	3	1	6	3	13	1	3	0	5	0	6	0	12	5	0	58
% Bus_Light Med Trucks	0	10.7	0.7	75	2.8	1.8	3.4	33.3	0	10.9	0	30	0	1.4	2.2	0	2.3
Heavy Trucks	0	0	1	0	0	4	0	0	0	1	0	1	2	6	0	2	17
% Heavy Trucks	0	0	0.7	0	0	0.5	0	0	0	2.2	0	5	2.4	0.7	0	66.7	0.7

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Lacy
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Groups Printed- cars

	RESEARCH PARK From North				LACY From East				RESEARCH PARK From South				LACY From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	1	1	0	8	34	2	0	6	1	3	2	6	34	13	0	111
07:15 AM	0	0	1	0	12	28	1	0	8	1	3	3	6	45	17	0	125
07:30 AM	0	2	2	0	16	41	3	0	8	3	5	0	6	52	16	0	154
07:45 AM	3	0	2	1	15	48	5	0	10	13	4	2	11	74	20	0	208
Total	3	3	6	1	51	151	11	0	32	18	15	7	29	205	66	0	598
08:00 AM	0	0	2	0	9	53	4	0	3	3	1	0	4	44	13	0	136
08:15 AM	2	7	6	0	9	40	7	0	15	8	4	2	9	32	12	0	153
08:30 AM	0	1	3	0	7	42	1	0	9	1	3	0	11	35	15	0	128
08:45 AM	0	0	4	0	7	34	1	0	6	2	1	0	5	30	6	0	96
Total	2	8	15	0	32	169	13	0	33	14	9	2	29	141	46	0	513
04:00 PM	3	0	11	0	1	29	1	0	7	1	9	0	3	61	12	0	138
04:15 PM	0	2	9	0	1	36	0	0	9	0	3	0	3	49	7	0	119
04:30 PM	2	2	21	0	2	46	0	0	4	2	10	0	1	45	10	0	145
04:45 PM	4	1	14	0	6	52	0	0	15	1	3	0	4	68	10	0	178
Total	9	5	55	0	10	163	1	0	35	4	25	0	11	223	39	0	580
05:00 PM	4	3	27	0	5	69	2	2	22	2	20	4	1	82	19	0	262
05:15 PM	2	3	16	0	1	68	1	0	9	0	3	0	1	65	17	1	187
05:30 PM	1	1	8	0	2	53	0	0	6	1	4	0	6	57	19	0	158
05:45 PM	3	2	8	1	5	43	0	4	10	1	1	0	3	56	15	0	152
Total	10	9	59	1	13	233	3	6	47	4	28	4	11	260	70	1	759
Grand Total	24	25	135	2	106	716	28	6	147	40	77	13	80	829	221	1	2450
Apprch %	12.9	13.4	72.6	1.1	12.4	83.6	3.3	0.7	53.1	14.4	27.8	4.7	7.1	73.3	19.5	0.1	
Total %	1	1	5.5	0.1	4.3	29.2	1.1	0.2	6	1.6	3.1	0.5	3.3	33.8	9	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
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File Name : ResearchPk-Lacy
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Groups Printed- Bus_Light Med Trucks

	RESEARCH PARK From North				LACY From East				RESEARCH PARK From South				LACY From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	1	0	0	1	2	0	0	0	0	0	0	0	0	1	0	5
07:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Total	0	1	0	0	3	3	1	0	0	0	0	0	0	3	1	0	12
08:00 AM	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	4
08:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	4
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	1	1	0	4	0	0	0	0	0	0	0	1	1	0	9
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	0	6
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	1	0	5
04:30 PM	0	0	0	0	0	2	0	0	0	1	0	0	0	0	1	0	4
04:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	3
Total	0	1	0	0	0	3	0	0	0	3	0	0	0	8	3	0	18
05:00 PM	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	2	0	2	0	0	0	1	0	0	0	0	5
05:30 PM	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0	0	4
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	6
Total	0	0	0	5	0	3	0	3	0	2	0	6	0	0	0	0	19
Grand Total	0	3	1	6	3	13	1	3	0	5	0	6	0	12	5	0	58
Apprch %	0	30	10	60	15	65	5	15	0	45.5	0	54.5	0	70.6	29.4	0	
Total %	0	5.2	1.7	10.3	5.2	22.4	1.7	5.2	0	8.6	0	10.3	0	20.7	8.6	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Lacy
Site Code : 00000000
Start Date : 5/30/2008
Page No : 1

Groups Printed- Heavy Trucks

	RESEARCH PARK From North				LACY From East				RESEARCH PARK From South				LACY From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Total	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	4
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	4
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	2	5
Grand Total	0	0	1	0	0	4	0	0	0	1	0	1	2	6	0	2	17
Apprch %	0	0	100	0	0	100	0	0	0	50	0	50	20	60	0	20	
Total %	0	0	5.9	0	0	23.5	0	0	0	5.9	0	5.9	11.8	35.3	0	11.8	

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Research Park and Nobel**
County: **Dane**
Traffic Control: **1/0/1900**
Project: **Fitchburg**

A.M. PEAK Tuesday, June 10, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Research Park From North				Nobel From East				Research Park From South				Nobel From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:00 AM	1	0	0	0	0	1	0	1	0	0	0	5	4	5	4	0	15
7:15 AM	1	4	2	1	0	0	2	1	1	0	2	1	1	5	5	0	23
7:30 AM	2	0	1	0	0	1	0	1	6	0	0	0	3	6	7	0	26
7:45 AM	1	0	2	0	0	2	2	2	4	1	1	1	9	13	5	0	40
Peak Hour Volume	**5**	**4**	**5**	**1**	**0**	**4**	**4**	**5**	**11**	**1**	**3**	**7**	**17**	**29**	**21**	**0**	**104**
U-Turn Hourly Volume			*0*				*1*				*0*				*0*		***1***
By Approach		**14**				**8**				**15**				**67**			**104**
TRUCK PERCENTAGES																	
% Single Unit Trucks	40.0%	25.0%	20.0%		0.0%	0.0%	0.0%		0.0%	0.0%	33.3%		5.9%	0.0%	0.0%		5.8%
% Heavy Trucks	0.0%	50.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	3.4%	0.0%		2.9%
% Trucks (Total)	**40.0%**	**75.0%**	**20.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**0.0%**	**33.3%**		**5.9%**	**3.4%**	**0.0%**		**8.7%**
By Approach		**42.9%**				**0.0%**				**6.7%**				**3.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.63**	**0.25**	**0.63**		**0**	**0.50**	**0.50**		**0.46**	**0.25**	**0.38**		**0.47**	**0.56**	**0.75**		**0.65**
By Approach		**0.50**				**0.50**				**0.63**				**0.62**			
HOURLY VOLUME-ROUNDED	**5**	**5**	**5**	**1**	**0**	**5**	**5**	**5**	**10**	**0**	**5**	**7**	**15**	**30**	**20**	**0**	**105**
By Approach		**15**				**10**				**15**				**65**			

P.M. PEAK Tuesday, June 10, 2008	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Research Park From North				Nobel From East				Research Park From South				Nobel From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:15 PM	3	0	0	0	0	10	0	0	0	1	2	0	0	2	1	0	19
4:30 PM	3	0	0	0	0	15	0	2	0	0	0	0	0	1	3	0	22
4:45 PM	2	0	2	1	4	14	0	2	0	0	0	0	0	0	2	0	24
5:00 PM	11	0	0	2	0	20	0	2	0	0	1	1	0	1	3	1	36
Peak Hour Volume	**19**	**0**	**2**	**3**	**4**	**59**	**0**	**6**	**0**	**1**	**3**	**1**	**0**	**4**	**9**	**1**	**101**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**21**				**63**				**4**				**13**			**101**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	50.0%		25.0%	3.4%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	22.2%		5.9%
% Heavy Trucks	5.3%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	33.3%		0.0%	0.0%	0.0%		2.0%
% Trucks (Total)	**5.3%**	**0.0%**	**50.0%**		**25.0%**	**3.4%**	**0.0%**		**0.0%**	**0.0%**	**33.3%**		**0.0%**	**0.0%**	**22.2%**		**7.9%**
By Approach		**9.6%**				**4.8%**				**25.0%**				**15.4%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.43**	**0**	**0.25**		**0.25**	**0.74**	**0**		**0**	**0.25**	**0.38**		**0**	**0.50**	**0.75**		**0.70**
By Approach		**0.48**				**0.79**				**0.33**				**0.81**			
HOURLY VOLUME-ROUNDED	**20**	**0**	**0**	**3**	**5**	**60**	**0**	**6**	**0**	**0**	**5**	**1**	**0**	**5**	**10**	**1**	**105**
By Approach		**20**				**65**				**5**				**15**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Nobel
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- cars - Bus_Light Med Trucks - Heavy Trucks

	RESEARCH PARK DR From North				NOBEL DR From East				RESEARCH PARK DR From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	1	0	0	1	0	1	0	0	0	5	4	5	4	0	21
07:15 AM	2	4	1	1	2	0	0	1	2	0	1	1	5	5	1	0	26
07:30 AM	1	0	2	0	0	1	0	1	0	0	6	0	7	6	3	0	27
07:45 AM	2	0	1	0	1	2	0	3	1	1	4	1	5	13	9	0	43
Total	5	4	5	1	3	4	0	6	3	1	11	7	21	29	17	0	117
08:00 AM	2	1	1	0	0	2	1	2	1	0	1	1	9	18	4	0	43
08:15 AM	1	0	1	1	1	0	0	1	0	1	1	3	6	18	3	1	38
08:30 AM	1	1	1	0	2	1	0	0	2	0	2	3	6	13	2	1	35
08:45 AM	0	0	3	0	0	1	0	0	1	0	1	6	3	17	2	1	35
Total	4	2	6	1	3	4	1	3	4	1	5	13	24	66	11	3	151
04:00 PM	0	0	3	2	0	7	1	2	3	1	0	0	3	1	0	0	23
04:15 PM	0	0	3	0	0	10	0	0	2	1	0	0	1	2	0	0	19
04:30 PM	0	0	3	0	0	15	0	2	0	0	0	0	3	1	0	0	24
04:45 PM	2	0	2	1	0	14	4	2	0	0	0	0	2	0	0	0	27
Total	2	0	11	3	0	46	5	6	5	2	0	0	9	4	0	0	93
05:00 PM	0	0	11	2	0	20	0	2	1	0	0	1	3	1	0	1	42
05:15 PM	0	1	7	1	0	8	0	1	2	2	0	1	5	0	1	0	29
05:30 PM	0	1	6	1	0	10	0	0	1	1	0	0	3	2	0	0	25
05:45 PM	0	1	3	0	0	7	0	0	1	1	0	0	5	0	1	0	19
Total	0	3	27	4	0	45	0	3	5	4	0	2	16	3	2	1	115
Grand Total	11	9	49	9	6	99	6	18	17	8	16	22	70	102	30	4	476
Apprch %	14.1	11.5	62.8	11.5	4.7	76.7	4.7	14	27	12.7	25.4	34.9	34	49.5	14.6	1.9	
Total %	2.3	1.9	10.3	1.9	1.3	20.8	1.3	3.8	3.6	1.7	3.4	4.6	14.7	21.4	6.3	0.8	
cars	8	6	46	7	5	95	4	15	13	8	16	19	66	97	26	3	434
% cars	72.7	66.7	93.9	77.8	83.3	96	66.7	83.3	76.5	100	100	86.4	94.3	95.1	86.7	75	91.2
Bus_Light Med Trucks	3	1	2	2	1	2	2	2	1	0	0	3	4	2	2	0	27
% Bus_Light Med Trucks	27.3	11.1	4.1	22.2	16.7	2	33.3	11.1	5.9	0	0	13.6	5.7	2	6.7	0	5.7
Heavy Trucks	0	2	1	0	0	2	0	1	3	0	0	0	0	3	2	1	15
% Heavy Trucks	0	22.2	2	0	0	2	0	5.6	17.6	0	0	0	0	2.9	6.7	25	3.2

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Nobel
Site Code : 00000000
Start Date : 6/10/2008
Page No : 1

Groups Printed- cars

	RESEARCH PARK DR From North				NOBEL DR From East				RESEARCH PARK DR From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	0	0	0	1	0	0	0	0	0	3	4	5	3	0	16
07:15 AM	1	1	1	1	2	0	0	0	1	0	1	0	5	5	1	0	19
07:30 AM	1	0	2	0	0	1	0	1	0	0	6	0	7	6	3	0	27
07:45 AM	2	0	0	0	1	2	0	2	1	1	4	1	5	12	9	0	40
Total	4	1	3	1	3	4	0	3	2	1	11	4	21	28	16	0	102
08:00 AM	2	1	1	0	0	1	1	2	1	0	1	1	9	17	4	0	41
08:15 AM	1	0	1	1	1	0	0	1	0	1	1	3	6	18	2	0	36
08:30 AM	0	1	1	0	1	1	0	0	2	0	2	3	6	13	1	1	32
08:45 AM	0	0	3	0	0	1	0	0	0	0	1	6	3	15	1	1	31
Total	3	2	6	1	2	3	1	3	3	1	5	13	24	63	8	2	140
04:00 PM	0	0	3	2	0	6	0	2	3	1	0	0	2	0	0	0	19
04:15 PM	0	0	3	0	0	10	0	0	1	1	0	0	1	2	0	0	18
04:30 PM	0	0	2	0	0	14	0	2	0	0	0	0	2	1	0	0	21
04:45 PM	1	0	2	0	0	13	3	2	0	0	0	0	2	0	0	0	23
Total	1	0	10	2	0	43	3	6	4	2	0	0	7	3	0	0	81
05:00 PM	0	0	11	2	0	20	0	2	1	0	0	1	2	1	0	1	41
05:15 PM	0	1	7	0	0	8	0	1	1	2	0	1	5	0	1	0	27
05:30 PM	0	1	6	1	0	10	0	0	1	1	0	0	2	2	0	0	24
05:45 PM	0	1	3	0	0	7	0	0	1	1	0	0	5	0	1	0	19
Total	0	3	27	3	0	45	0	3	4	4	0	2	14	3	2	1	111
Grand Total	8	6	46	7	5	95	4	15	13	8	16	19	66	97	26	3	434
Apprch %	11.9	9	68.7	10.4	4.2	79.8	3.4	12.6	23.2	14.3	28.6	33.9	34.4	50.5	13.5	1.6	
Total %	1.8	1.4	10.6	1.6	1.2	21.9	0.9	3.5	3	1.8	3.7	4.4	15.2	22.4	6	0.7	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : ResearchPk-Nobel
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- Bus_Light Med Trucks

	RESEARCH PARK DR From North				NOBEL DR From East				RESEARCH PARK DR From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	1	0	0	0	0	1	0	0	0	2	0	0	1	0	5
07:15 AM	1	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	5
07:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	1	2	0	0	0	0	2	1	0	0	3	0	0	1	0	11
08:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	4
04:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	3
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
04:45 PM	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	4
Total	1	0	0	1	0	2	2	0	0	0	0	0	2	1	0	0	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
05:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	3
Grand Total	3	1	2	2	1	2	2	2	1	0	0	3	4	2	2	0	27
Apprch %	37.5	12.5	25	25	14.3	28.6	28.6	28.6	25	0	0	75	50	25	25	0	
Total %	11.1	3.7	7.4	7.4	3.7	7.4	7.4	7.4	3.7	0	0	11.1	14.8	7.4	7.4	0	

Traffic Analysis & Design, Inc.

N36 W7505 Buchanan Street
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File Name : ResearchPk-Nobel
Site Code : 00000000
Start Date : 6/10/2008
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Groups Printed- Heavy Trucks

	RESEARCH PARK DR From North				NOBEL DR From East				RESEARCH PARK DR From South				NOBEL DR From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
Total	0	2	0	0	0	0	0	1	0	0	0	0	0	1	0	0	4
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
Total	0	0	0	0	0	1	0	0	1	0	0	0	0	2	2	1	7
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
04:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Grand Total	0	2	1	0	0	2	0	1	3	0	0	0	0	3	2	1	15
Apprch %	0	66.7	33.3	0	0	66.7	0	33.3	100	0	0	0	0	50	33.3	16.7	
Total %	0	13.3	6.7	0	0	13.3	0	6.7	20	0	0	0	0	20	13.3	6.7	

APPENDIX A

Existing Traffic Signal Timings

By-Phase Timing Data

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Direction	SBLT	NB	EBLT	WB		SB		EB				
Minimum Green	5	16	5	10	5	16	5	10	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	13	0	16	0	8	0	19	0	0	0	0
Ped Clearance	0	8	0	11	0	14	8	15	0	16	0	16
Veh Extension	2.0	4.0	2.0	4.0	5.0	4.0	5.0	4.0	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	20	50	20	25	35	50	35	25	35	35	35	35
Max 2	20	50	20	25	40	50	40	25	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	4.0	4.0	3.5	3.5	3.0	4.0	3.0	3.5	3.0	3.0	3.0	3.0
Red Clearance	1.0	1.5	0.5	3.0	1.0	1.5	1.0	3.0	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	20	0	10	0	20	0	10	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	10	0	10	0	10	0	10	0	0	0	0
Minimum Gap	0.0	3.0	0.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0

Option Data

	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Guaranteed Passage				X				X				
Call To NonActuated 1												
Call To NonActuated 2												
Dual Entry				X				X				
Conditional Service												
Conditional Reservice												
Actuated Rest in Walk												
Flashing Walk												

Enable Programmable Options

Dual Entry	ON	Backup Protection Group 1	ON
Conditional Service	OFF	Backup Protection Group 2	ON
Ped Clearance Protection	ON	Backup Protection Group 3	ON
Special Preempt Overlap Flash	OFF	Simultaneous Gap Group 1	ON
Cond Service Det Cross Switch	OFF	Simultaneous Gap Group 2	ON
Lock Detectors in Red Only	OFF	Simultaneous Gap Group 3	ON

Five Section Left Turn Control

Phases:	5-2	7-4	1-6	3-8	11-10	9-12
Left Turn Head						

Recall Data, Dimming

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Locking Detector. . . .	.	X	.	X	.	X	.	X	.	.	.	.
Vehicle Recall.	.	X	.	.	.	X	.	.	.	.	.	.
Pedestrian Recall . . .	.	.	.	.	.	.	.	.	.	.	.	.
Recall To Max	.	.	.	.	.	.	.	.	.	.	.	.
Soft Recall	.	.	.	.	.	.	.	.	.	.	.	.
Don't Rest Here	.	.	.	.	.	.	.	.	.	.	.	.
Ped Dark if No Call . .	.	.	.	.	.	.	.	.	.	.	.	.

Dimming:

	Load Switch															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green/Walk. . . .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Yellow/Ped Clear.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Red/Don't Walk. .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Detector Type/Timers

Det.	Locking Memory	Log Enable	Timers Extend	Timers Delay	Don't Reset Extend	Type
1	NO	NO	0.0	0	.	0 - Normal
2	NO	NO	0.0	0	.	0 - Normal
3	NO	NO	0.0	0	.	0 - Normal
4	NO	NO	0.0	0	.	0 - Normal
5	NO	NO	0.0	0	.	0 - Normal
6	NO	NO	0.0	0	.	0 - Normal
7	NO	NO	3.0	0	.	1 - Extend/Delay
8	NO	NO	0.0	0	.	0 - Normal
9	NO	NO	3.0	0	.	1 - Extend/Delay
10	NO	NO	0.0	0	.	0 - Normal
11	NO	NO	0.0	0	.	0 - Normal
12	NO	NO	3.0	0	.	1 - Extend/Delay
13	NO	NO	3.0	0	.	1 - Extend/Delay
14	NO	NO	3.0	0	.	1 - Extend/Delay
15	NO	NO	0.0	0	.	0 - Normal
16	NO	NO	0.0	0	.	0 - Normal
17	NO	NO	0.0	0	.	0 - Normal
18	NO	NO	0.0	0	.	0 - Normal
19	NO	NO	0.0	0	.	0 - Normal
20	NO	NO	0.0	0	.	0 - Normal
21	NO	NO	0.0	0	.	0 - Normal
22	NO	NO	0.0	0	.	0 - Normal
23	NO	NO	0.0	0	.	0 - Normal
24	NO	NO	0.0	0	.	0 - Normal
25	NO	NO	0.0	0	.	0 - Normal
26	NO	NO	0.0	0	.	0 - Normal
27	NO	NO	0.0	0	.	0 - Normal
28	NO	NO	0.0	0	.	0 - Normal
29	NO	NO	0.0	0	.	0 - Normal
30	NO	NO	0.0	0	.	0 - Normal
31	NO	NO	0.0	0	.	0 - Normal
32	NO	NO	0.0	0	.	0 - Normal

FISH HATCHERY Fish Hatchery & Lacy 8/8/2005 11:27

Detector Phase Assignment

Det.	Phase 1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	X	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	X	.	.	.	.	.	.	.	.
6	.	X	.	.	.	.	.	.	.	.	.	.
7	.	X	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	X	.	.	.	.
10	.	.	X	.	.	.	.	X	.	.	.	.
11	X	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	X	.	.	.	.	.	.
13	.	.	.	X	.	.	.	.	.	.	.	.
14	.	.	.	X	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.
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29	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	.	.	.	.	.

Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	X	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	X	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
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24	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	.	.	.	.	.

FISH HATCHERY Fish Hatchery & Lacy 8/8/2005 11:27

TOD Weekly/Yearly

Weekly Program Numbers

	1	2	3	4	5	6	7	8	9	10	
Sunday . . .	3	1	1	1	1	1	1	1	1	1	Program No.
Monday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Tuesday. . .	1	1	1	1	1	1	1	1	1	1	Program No.
Wednesday. .	1	1	1	1	1	1	1	1	1	1	Program No.
Thursday . .	1	1	1	1	1	1	1	1	1	1	Program No.
Friday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Saturday . .	2	1	1	1	1	1	1	1	1	1	Program No.

Week of Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

FISH HATCHERY Fish Hatchery & Lacy 8/8/2005 11:27

TOD Program Steps

Step 1 Program 1 Step Begins 0600

Flash.	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Step 2 Program 1 Step Begins 2200

Flash. X	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	X	X	X	X	.	X	.	X	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

FISK HATCHERY Fish Hatchery & Lacy 8/8/2005 11:27

TOD Program Steps

Step 3 Program 2 Step Begins 0800

Flash.	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Step 4 Program 2 Step Begins 2200

Flash. X	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	X	X	X	X	.	X	.	X	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

FISK HATCHERY Fish Hatchery & Lacy 8/8/2005 11:27

TOD Program Steps

Step 5 Program 3 Step Begins 0900

Flash.	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Step 6 Program 3 Step Begins 2200

Flash. X	Dimming Enable. . . . .
Red Rest	Alt Veh Extension . . . .
Spare 5.	Det Log Enable. . . . .
Spare 3.	Spare 4 . . . . .
Type 0 Dly Enable. . .	Spare 2 . . . . .
Det Diag Plan. . . . 0	

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	X	X	X	X	.	X	.	X	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Loop Assignments:
#1 SB Fish 6x20 left turn
#2 SB Fish Middle
#3 EB Lacy 6x20 Left turn
#4 WB Lacy Mid 6x20
#5 WB Lacy Mid Rght
#6 NB Fish Mid
#7 NB Fish Back
#8 EB Lacy Mid
#9 EB Lacy Back
#10 EB lacy 6X6 left turn
#11 SB fish 6x6 Left turn
#12 SB fish Back
#13 WB Lacy Back Rt
#14 WB Lacy Back left
#15 WB Lacy front rt.
#16 WB Lacy front lef

DWG NO: DP0402	SHEET NO E-1
TRAFFIC SIGNAL PLAN	
FISH HATCHERY RD & LACY RD	CITY OF MADISON TRAFFIC ENGINEERING

7-27-04 KJF
ASBUILT REV. 11-23-05 KJF

OFFSETS FROM FACE OF CURB

TS1 4'
TS2 6' FROM EAST SIDE OF MEDIAN
TS3 5'
TS5 4' FROM NORTH SIDE OF MEDIAN
TS6 6'
TS7 4'
TS8 5' FROM EAST SIDE OF MEDIAN
TS9 6.5'
TS10 5'
TS11 4.5'

TO HHs 3&4 @ 140' AND 325' FROM STOP BAR
6'x12' LOOPS CENTERED ACROSS THROUGH LANE LINE AT EACH HANDHOLE

LACY RD

FISH HATCHERY RD

TO HH15 190' FROM STOP BAR
6'X6' LOOP
3' OFF LANE LINE

TO HHs 10 & 11 @ 140' AND 325' FROM STOP BAR
6'x12' LOOPS CENTERED ACROSS THROUGH LANE LINE AT EACH HANDHOLE

LEGEND

- TYPE I PULL BOX
- TYPE III PULL BOX
- BASE TYPE IN "NOTES"
- PVC CONDUIT
- WOOD POLE
- TYPE M BASE
- PROPOSED LOOPS
- EXISTING LOOPS

NOTES:
1. ALL BASES ARE TYPE G, EXCEPT TS3, TS6, TS9, AND TS11 ARE LB-8 WITH 11" B.C.; AND TS4 IS AN MGE WOOD POLE.
2. CONDUITS CROSSING STREETS ARE "EXISTING", 3" PVC, EXCEPT EAST LEG IS 4" PVC.
3. EAST LEG LOOPS ARE EXISTING.
4. INSTALL 2" FROM HH5 TO WEST OF EXISTING WOOD POLE FOR FUTURE TYPE G BASE, WHICH WILL BE NEEDED FOR FUTURE PEDESTRIAN SIGNALS.
5. INSTALL TOMAR ON TS5 FOR EB AND TSII FOR WB.

SIGNAL HEAD LAYOUT

	NR	FR	NL	FL
NB	7A	3B	--	2A
SB	1A	9B	2C	8C
EB	10A	6D	--	5C
WB	4A	11B	--	10A

"A" R Y G 12" W/BKPL
"B" R Y G 12" W/BKPL
"C" R Y G Y 12" W/BKPL
"D" R Y Y G G 12" W/BKPL

ALL RED AND GREEN BALL AND GREEN ARROW SIGNALS SHALL BE LED.
ALL SIGNALS HAVE BACKPLATES.

ORIGINATOR: CITY_OF_MADISON_STREETS_ENGINEERING

M:/DESIGN/TRAFFIC/DGN/DP/DP0402.DGN

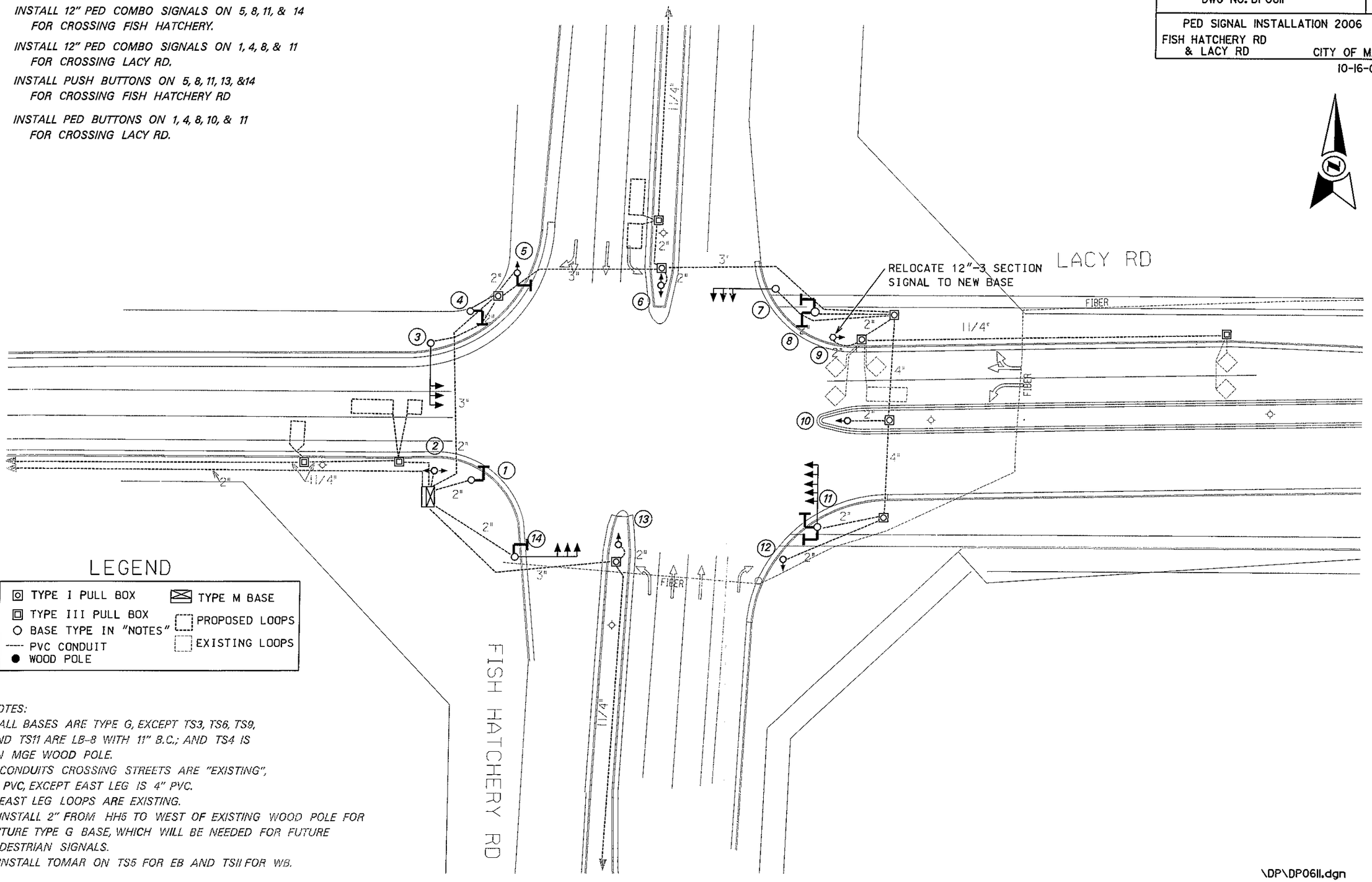
DWG NO: DP0611	SHEET NO. E-1
PED SIGNAL INSTALLATION 2006 FISH HATCHERY RD & LACY RD — CITY OF MADISON 10-16-06 KJF	

INSTALL 12" PED COMBO SIGNALS ON 5, 8, 11, & 14 FOR CROSSING FISH HATCHERY.

INSTALL 12" PED COMBO SIGNALS ON 1, 4, 8, & 11 FOR CROSSING LACY RD.

INSTALL PUSH BUTTONS ON 5, 8, 11, 13, &14 FOR CROSSING FISH HATCHERY RD

INSTALL PED BUTTONS ON 1, 4, 8, 10, & 11 FOR CROSSING LACY RD.



LEGEND

- TYPE I PULL BOX
- TYPE III PULL BOX
- BASE TYPE IN "NOTES"
- PVC CONDUIT
- WOOD POLE
- TYPE M BASE
- PROPOSED LOOPS
- EXISTING LOOPS

NOTES:

1. ALL BASES ARE TYPE G, EXCEPT TS3, TS6, TS9, AND TS11 ARE LB-8 WITH 11" B.C.; AND TS4 IS AN MGE WOOD POLE.

2. CONDUITS CROSSING STREETS ARE "EXISTING", 3" PVC, EXCEPT EAST LEG IS 4" PVC.

3. EAST LEG LOOPS ARE EXISTING.

4. INSTALL 2" FROM HH5 TO WEST OF EXISTING WOOD POLE FOR FUTURE TYPE G BASE, WHICH WILL BE NEEDED FOR FUTURE PEDESTRIAN SIGNALS.

5. INSTALL TOMAR ON TS5 FOR EB AND TS11 FOR WB.

\DP\DP0611.dgn

M:/DESIGN/TRAFFIC/DGN/DP/DP0402.DGN

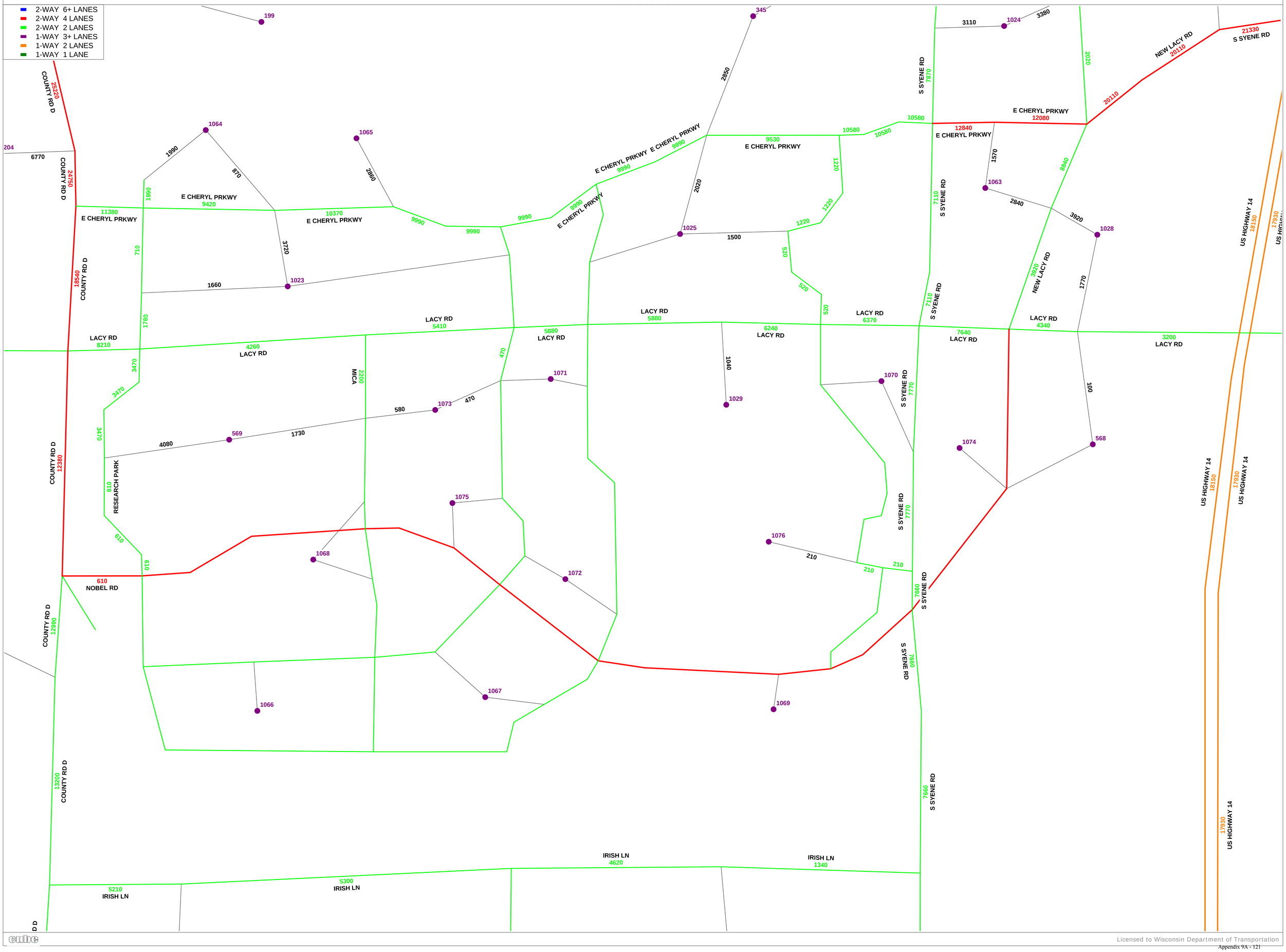
By-Phase Timing Data

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Direction	SBLT	NB		WB		SB		EB				
Minimum Green	5	16	5	10	5	18	5	10	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	8	0	16	0	7	0	0	0	10	0	10
Ped Clearance	0	13	0	11	0	11	7	16	0	16	0	16
Veh Extension	2.0	4.0	5.0	3.5	5.0	4.0	5.0	3.5	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	15	60	35	25	35	60	35	25	35	35	35	35
Max 2	15	60	40	25	40	60	40	25	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	4.0	4.0	3.0	3.5	3.0	4.0	3.0	3.5	3.0	3.0	3.0	3.0
Red Clearance	1.0	1.5	1.0	2.5	1.0	1.5	1.0	2.5	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	20	0	10	0	20	0	10	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	10	0	5	0	10	0	5	0	0	0	0
Minimum Gap	0.0	3.0	0.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0

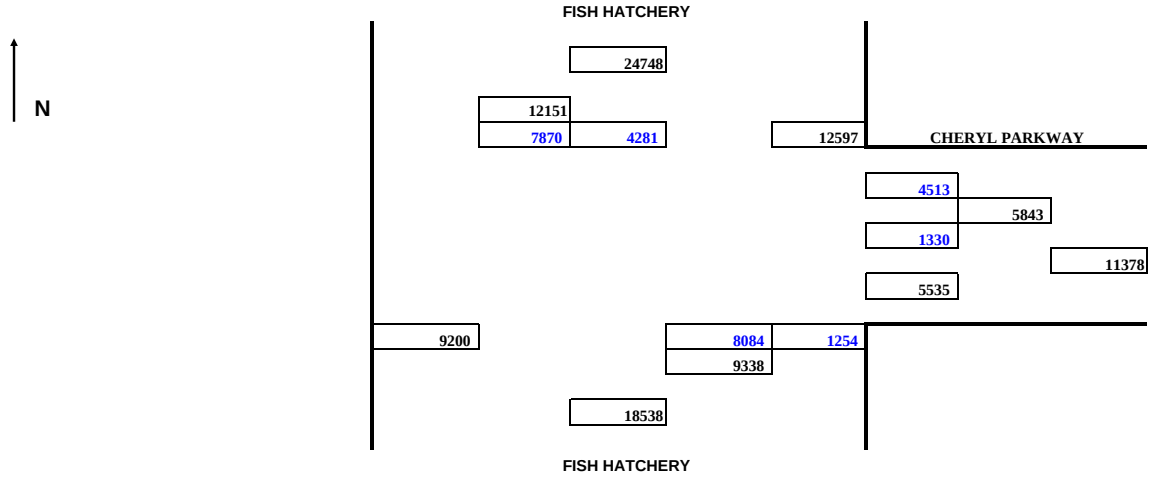
APPENDIX A

MPO Year 2025 Background Traffic ADT Forecasts

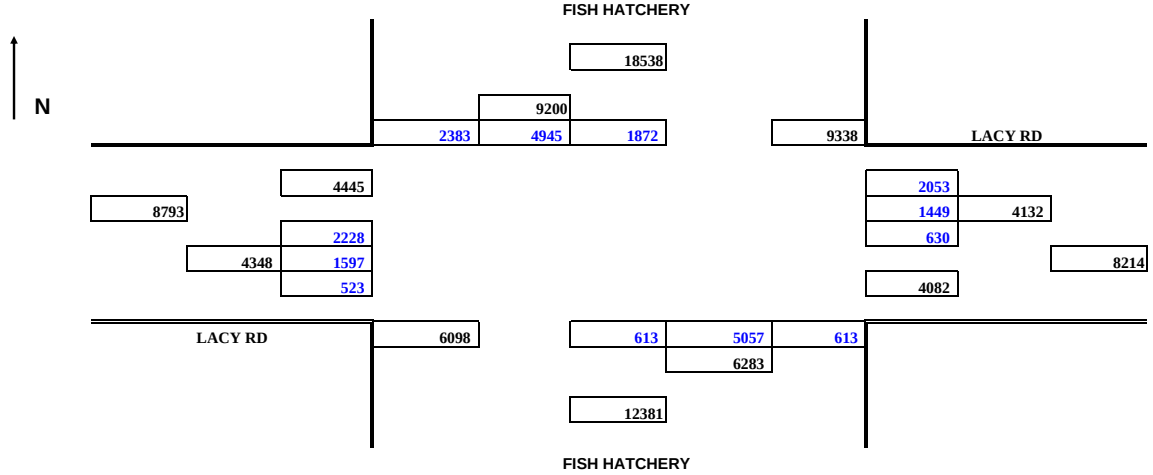
DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT A: 2025 BACKGROUND AADT VOLUMES REVISED 12/18/08
12/18/08



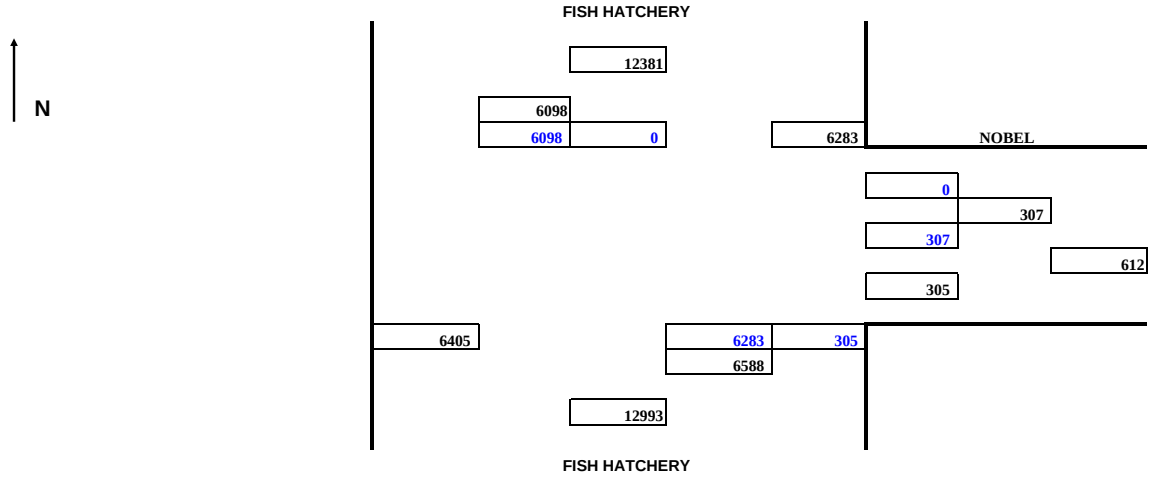
ALT A: 2025 BACKGROUND
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



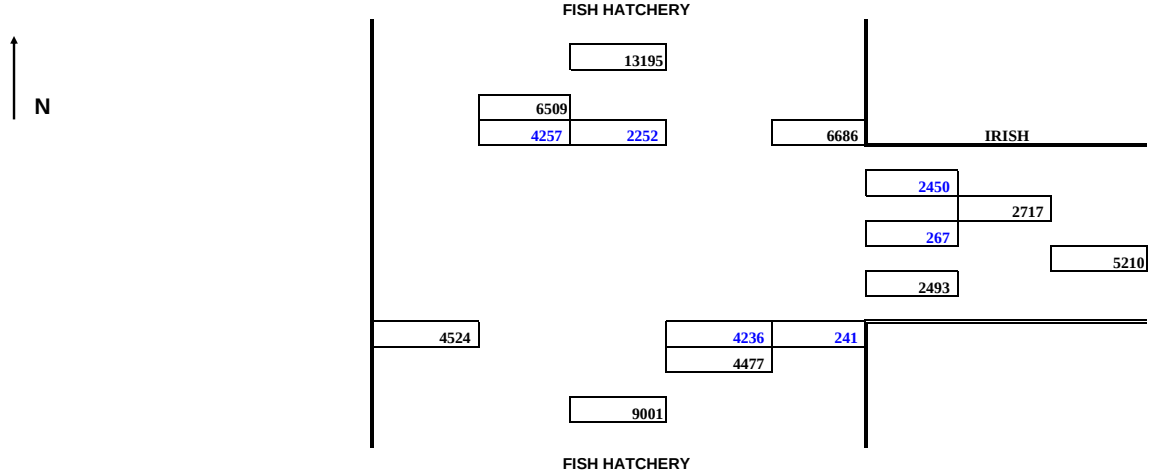
ALT A: 2025 BACKGROUND
LOCATION 2: FISH HATCHERY - LACY



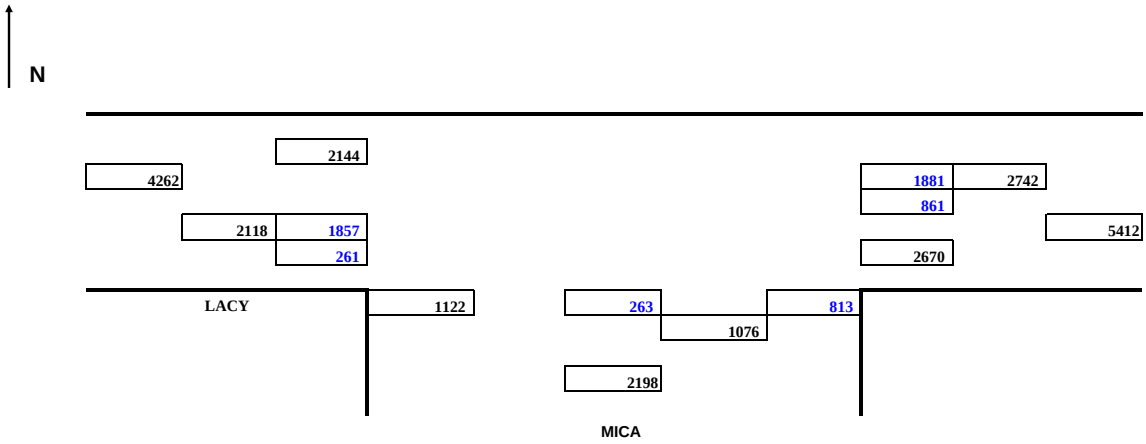
ALT A: 2025 BACKGROUND
LOCATION 3: FISH HATCHERY - NOBEL



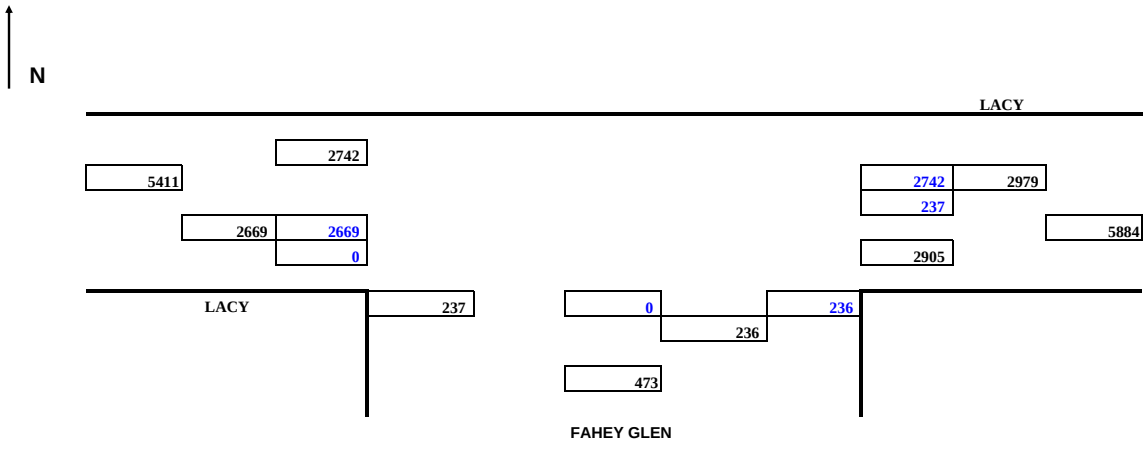
ALT A: 2025 BACKGROUND
LOCATION 4: FISH HATCHERY - IRISH



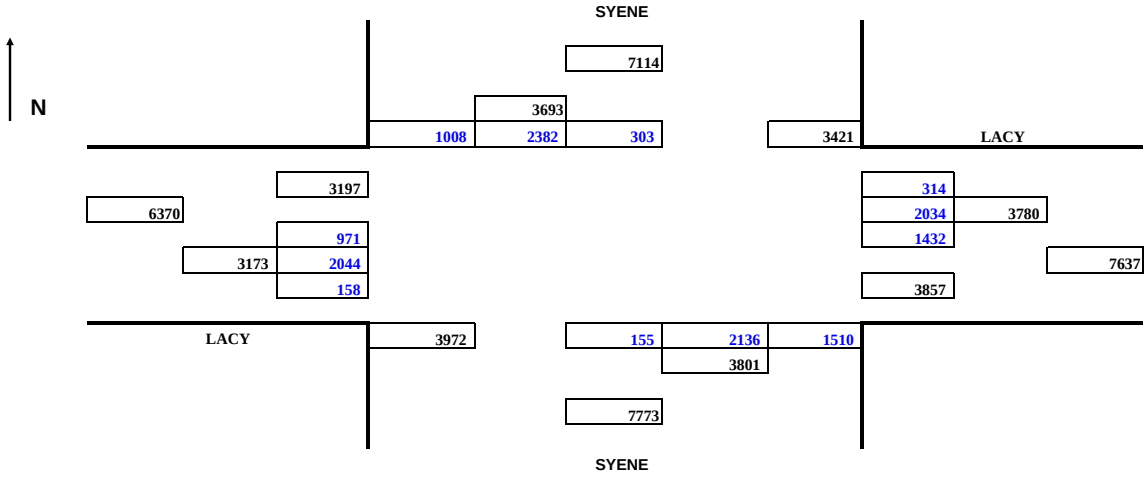
ALT A: 2025 BACKGROUND
LOCATION 6: LACY - MICA



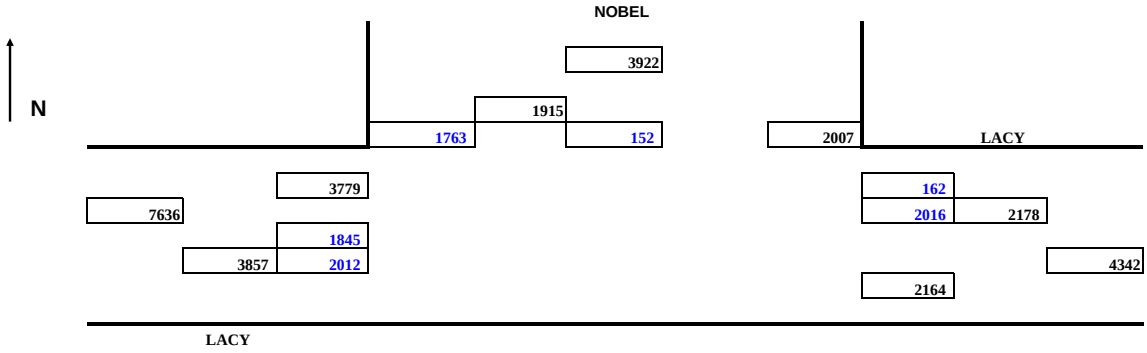
ALT A: 2025 BACKGROUND
LOCATION 8: LACY - FAHEY GLEN



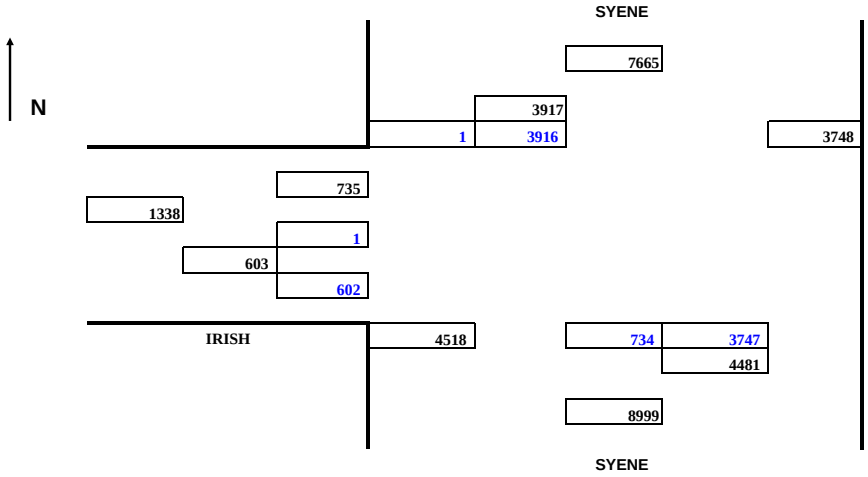
ALT A: 2025 BACKGROUND
LOCATION 12: LACY - SYENE



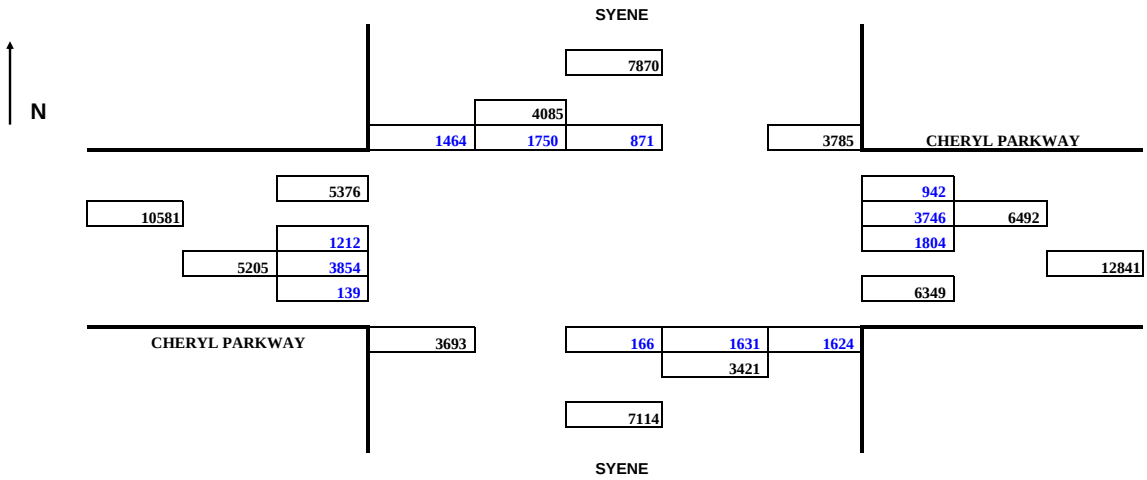
ALT A: 2025 BACKGROUND
LOCATION 13: NOBEL - LACY



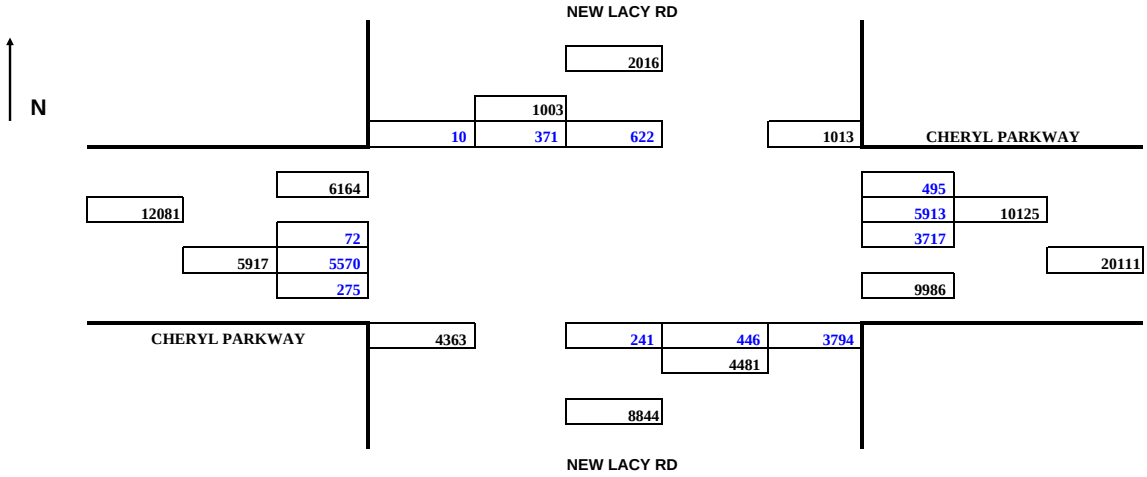
ALT A: 2025 BACKGROUND
LOCATION 14: IRISH - SYENE



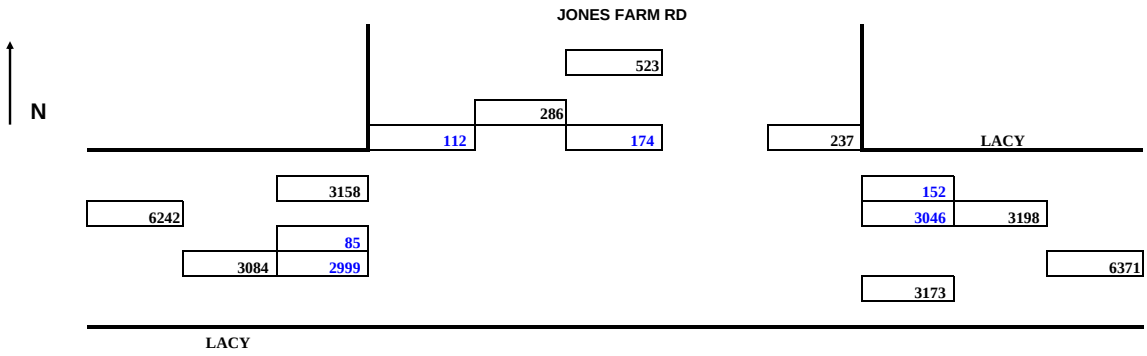
ALT A: 2025 BACKGROUND
LOCATION 15: CHERYL PARKWAY - SYENE



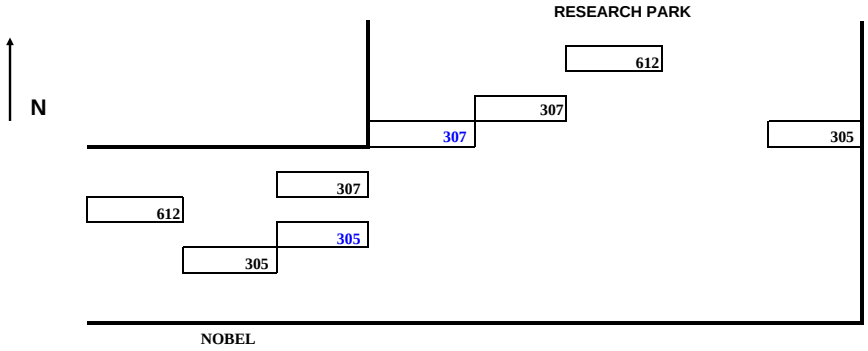
ALT A: 2025 BACKGROUND
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



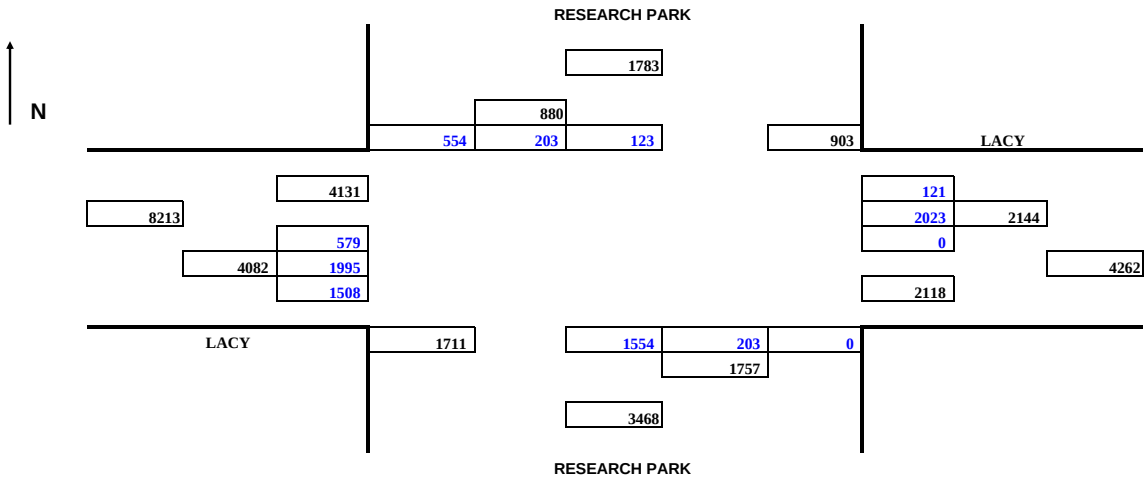
ALT A: 2025 BACKGROUND
LOCATION 17: LACY - JONES FARM RD



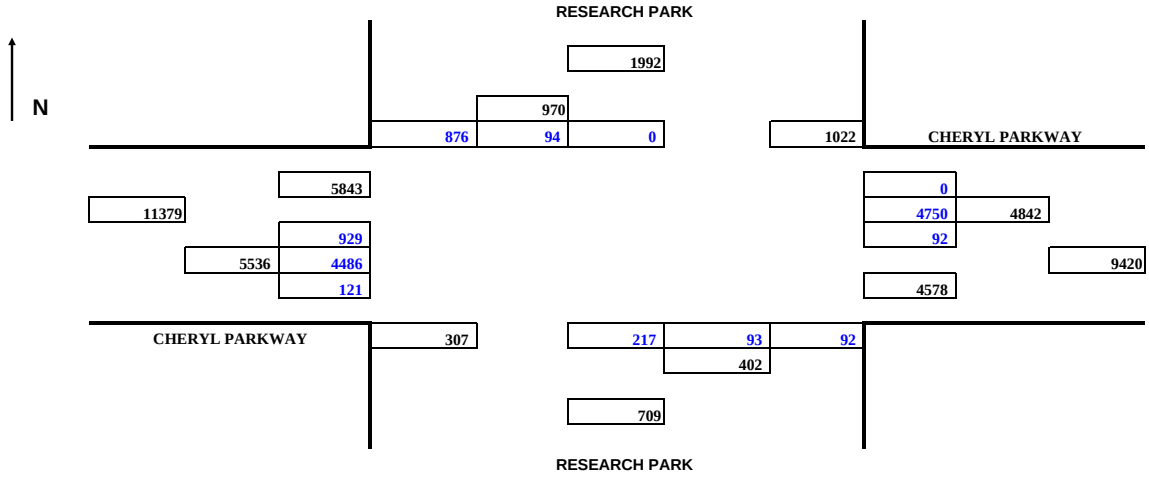
ALT A: 2025 BACKGROUND
LOCATION 19: NOBEL - RESEARCH PARK



ALT A: 2025 BACKGROUND
LOCATION 20: LACY - RESEARCH PARK

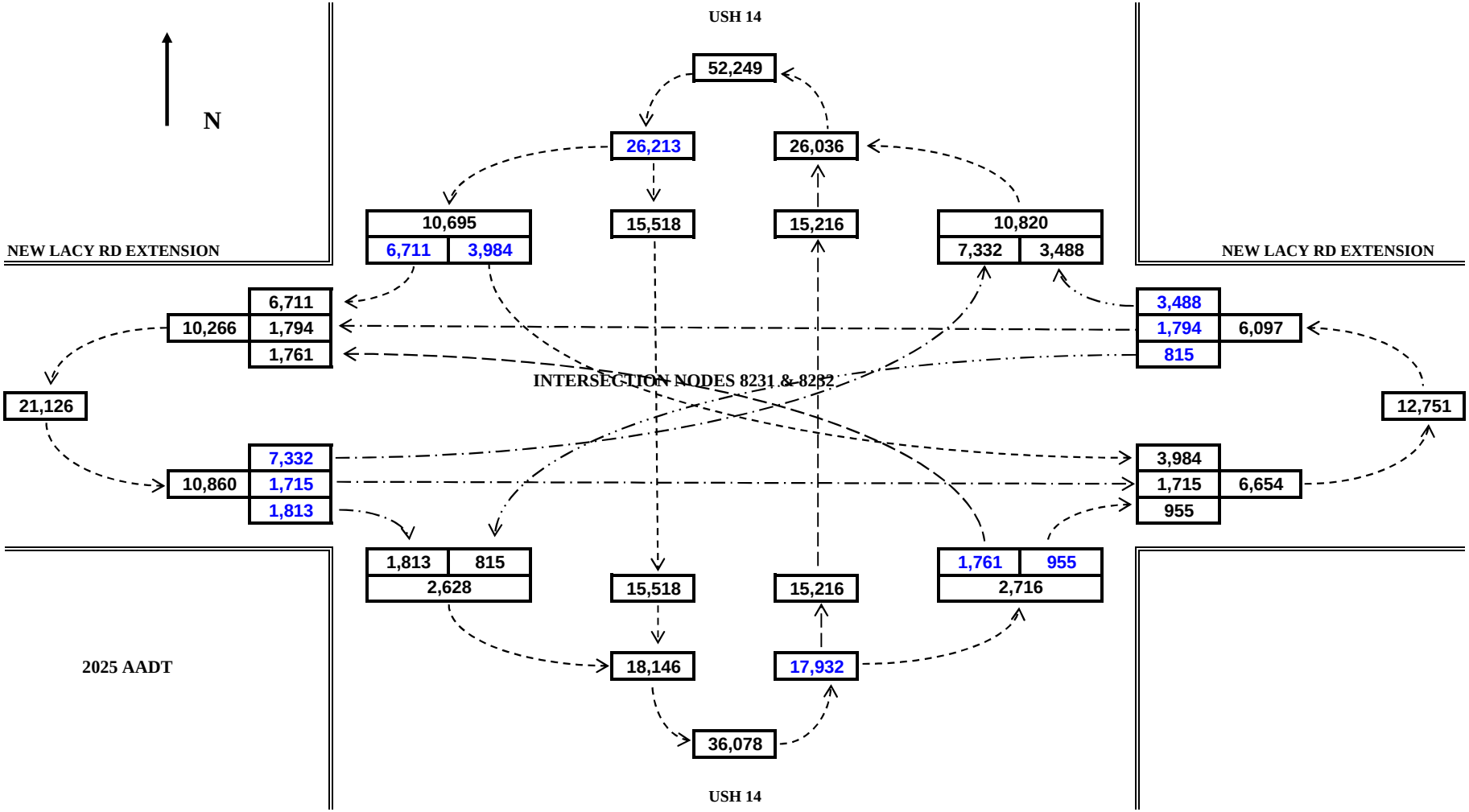


ALT A: 2025 BACKGROUND
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT A: 2025 BACKGROUND

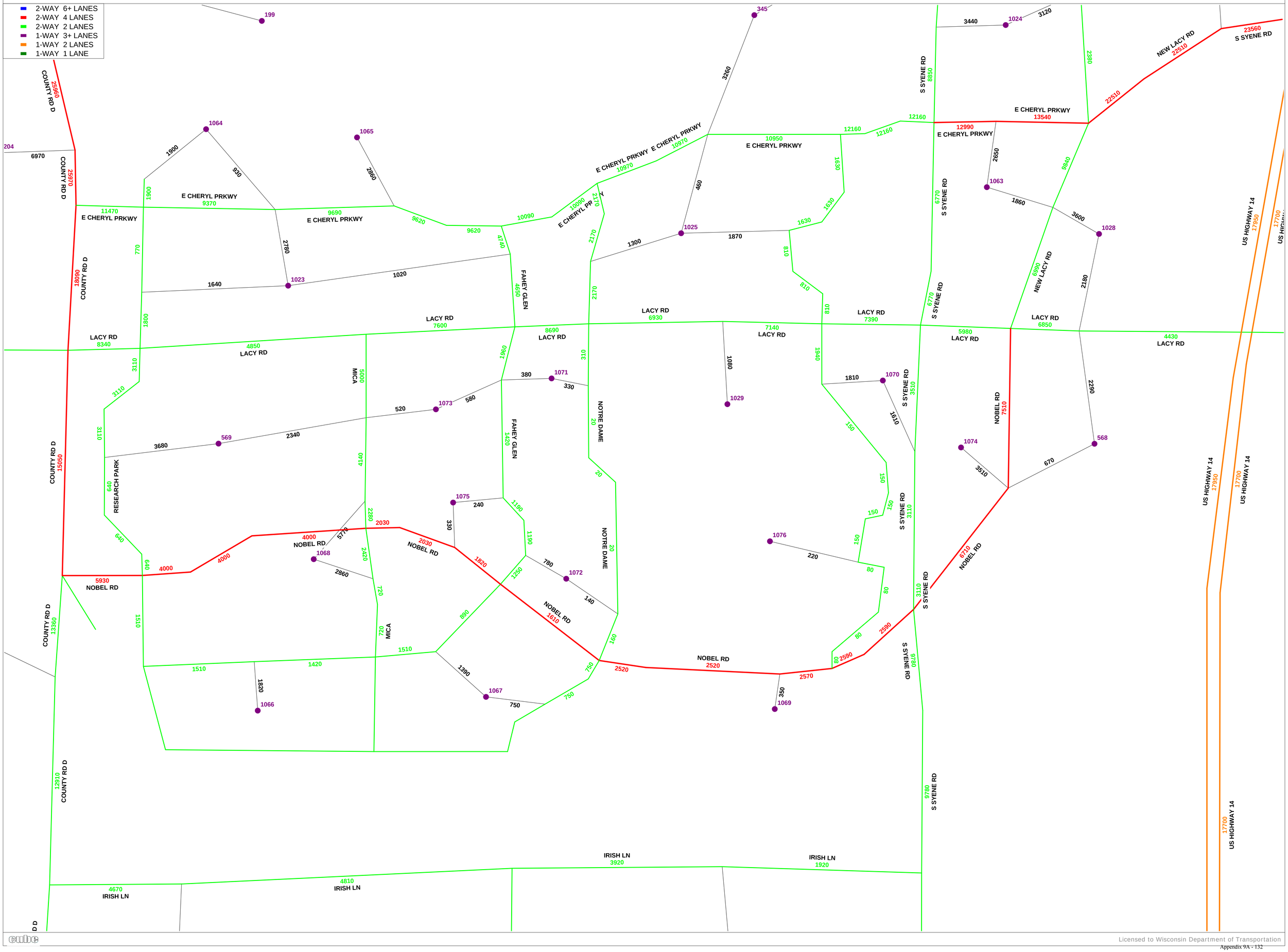
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



APPENDIX A

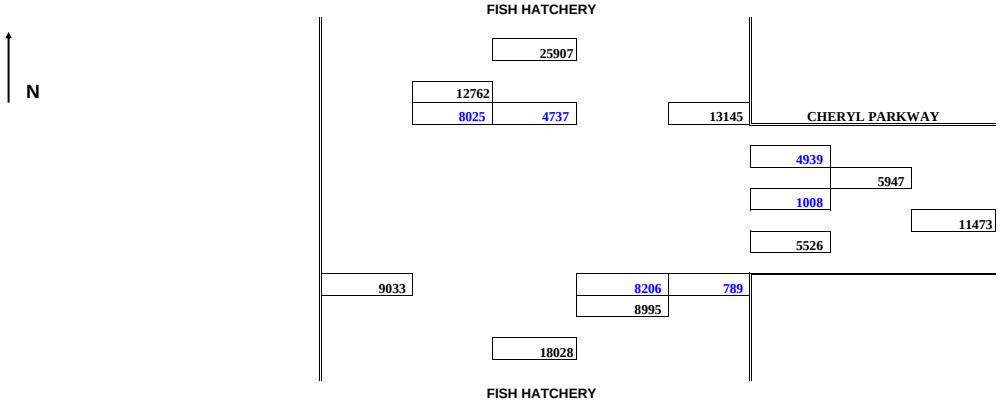
MPO Year 2035 Background Traffic ADT Forecasts

DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT B: 2025 BUILD AADT VOLUMES REVISED 12/18/08
12/18/08

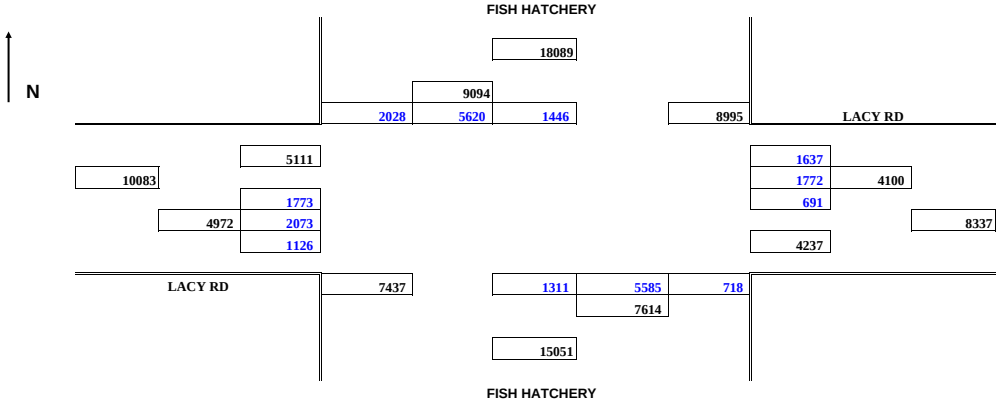


cube
Licensed to Wisconsin Department of Transportation

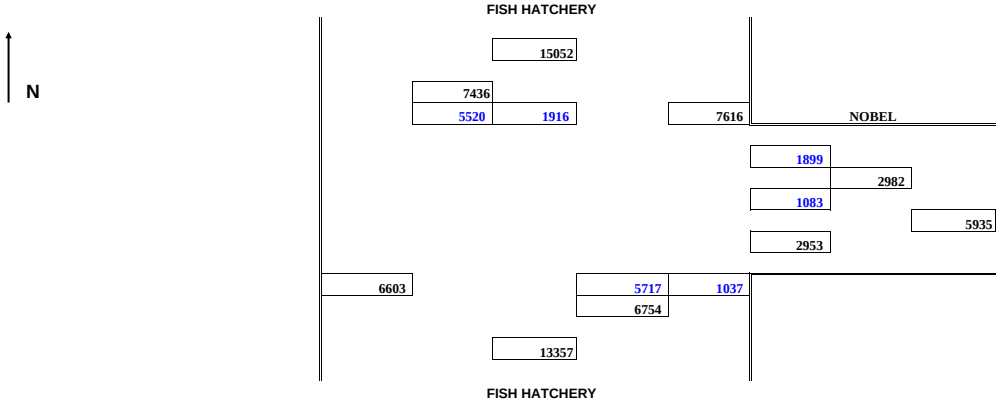
ALT B: 2025 BUILD
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



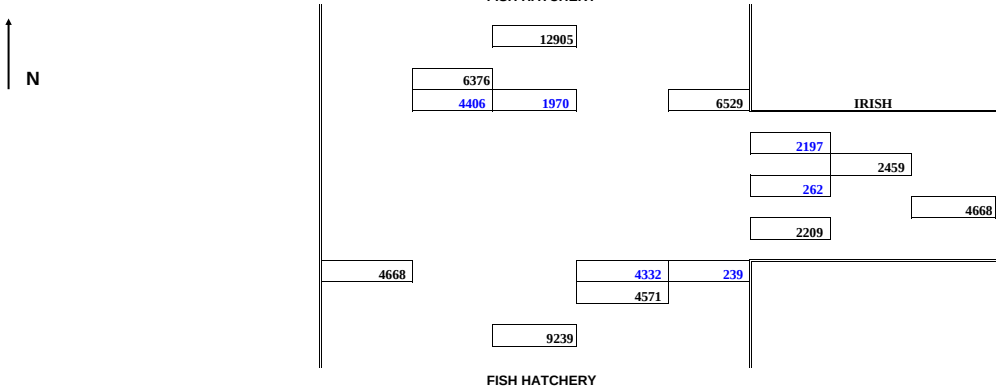
ALT B: 2025 BUILD
LOCATION 2: FISH HATCHERY - LACY



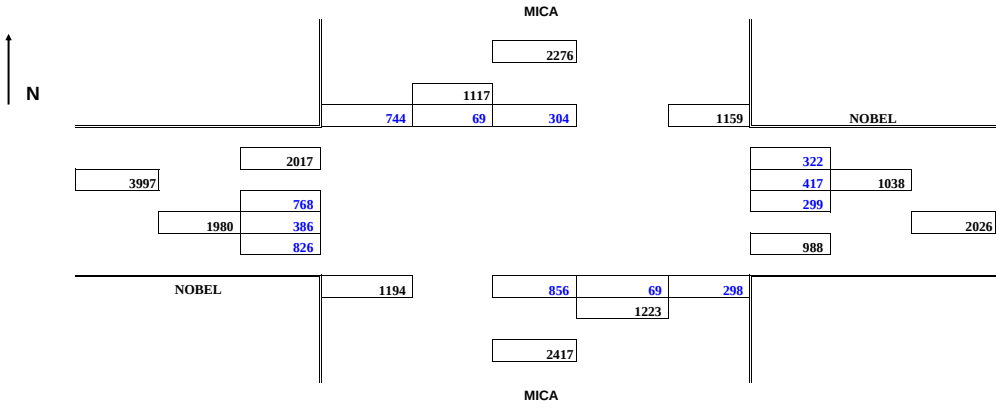
ALT B: 2025 BUILD
LOCATION 3: FISH HATCHERY - NOBEL



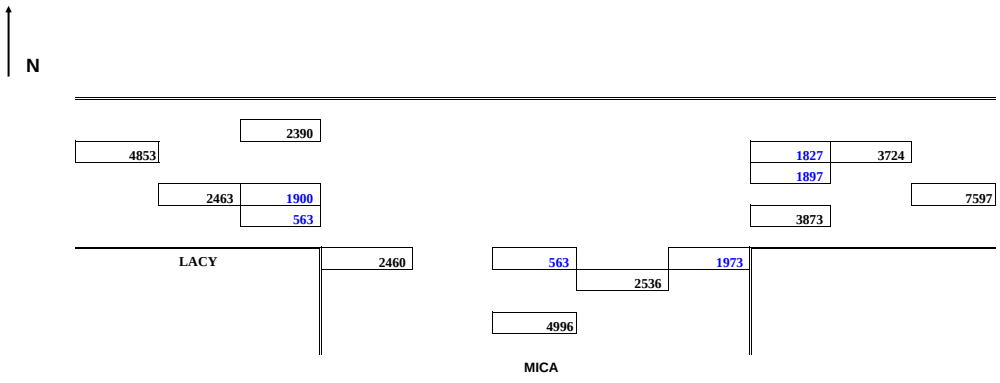
ALT B: 2025 BUILD
LOCATION 4: FISH HATCHERY - IRISH



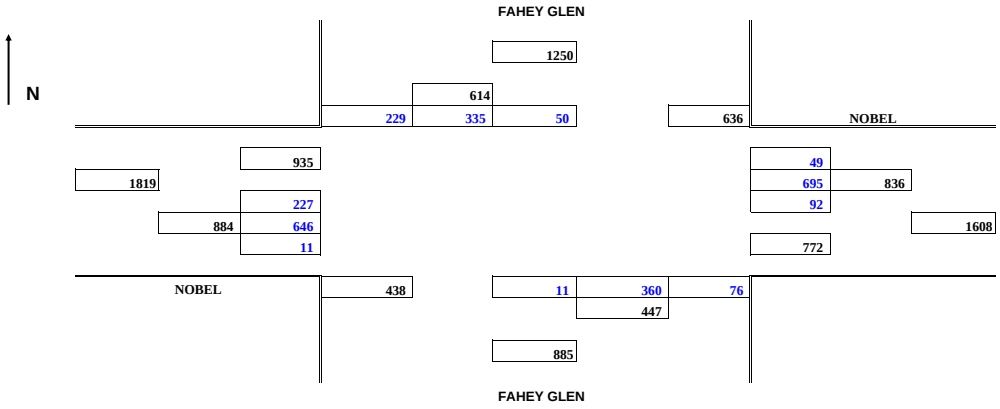
ALT B: 2025 BUILD
LOCATION 5: NOBEL - MICA



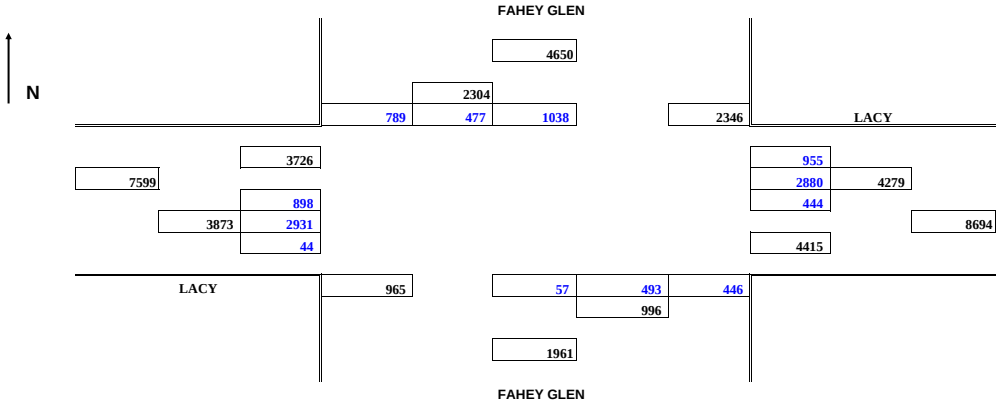
ALT B: 2025 BUILD
LOCATION 6: LACY - MICA



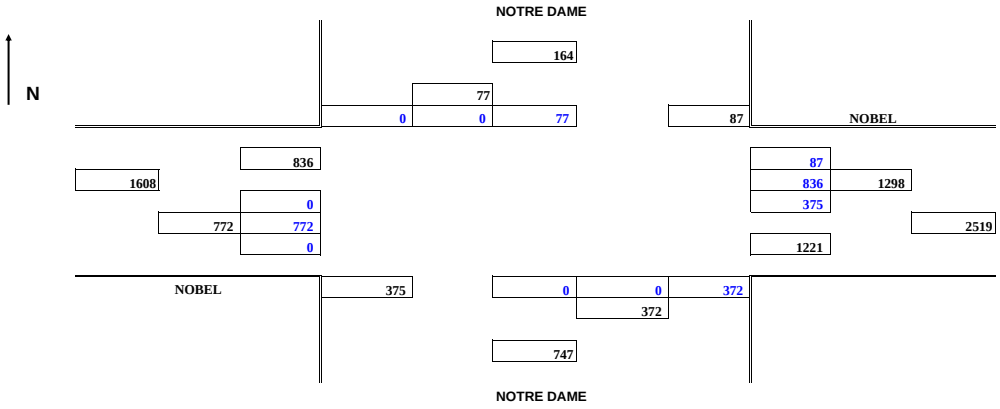
ALT B: 2025 BUILD
LOCATION 7: NOBEL - FAHEY GLEN



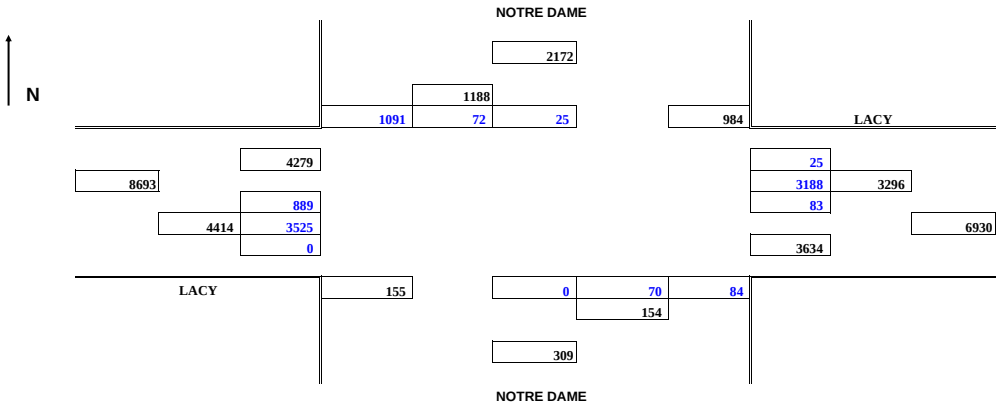
ALT B: 2025 BUILD
LOCATION 8: LACY - FAHEY GLEN



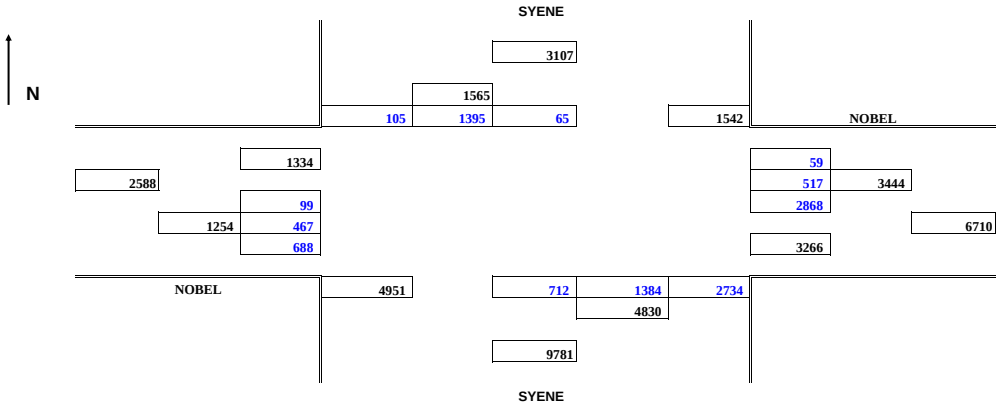
ALT A: 2025 BACKGROUND
LOCATION 9: NOBEL - NOTRE DAME



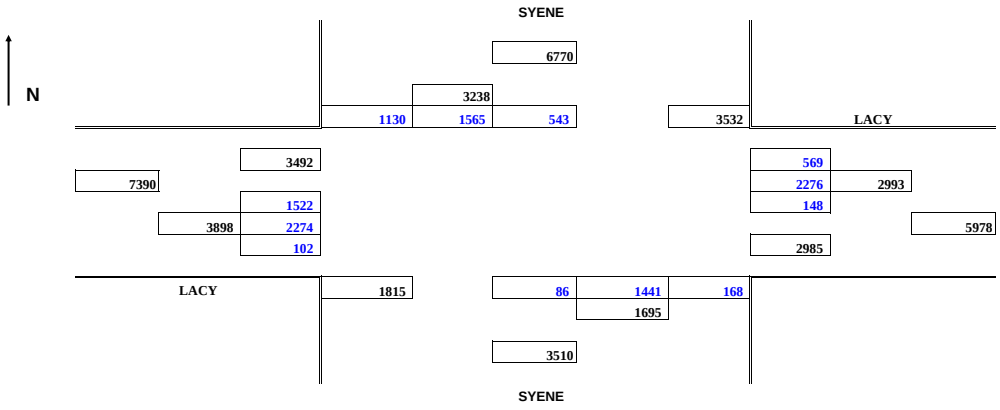
ALT B: 2025 BUILD
LOCATION 10: LACY - NOTRE DAME



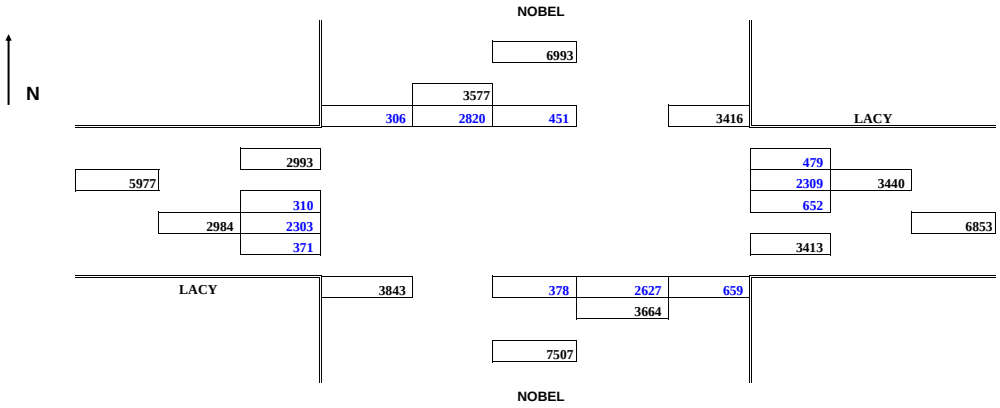
ALT B: 2025 BUILD
LOCATION 11: NOBEL - SYENE



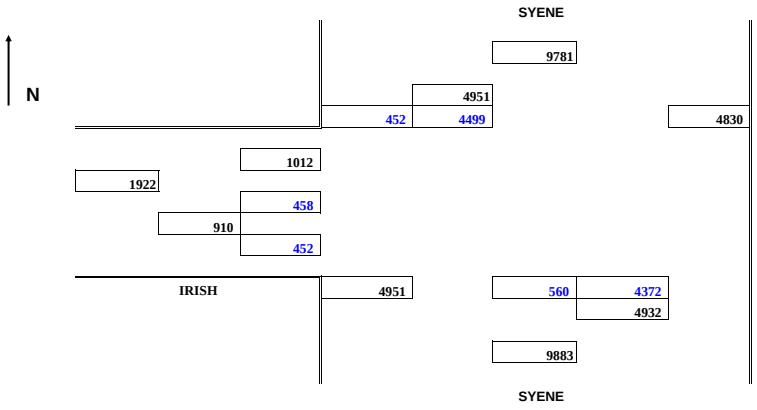
ALT B: 2025 BUILD
LOCATION 12: LACY - SYENE



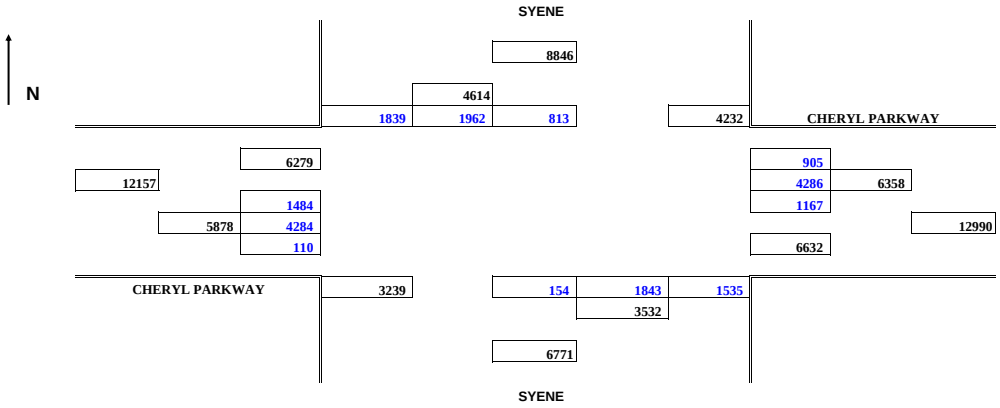
ALT B: 2025 BUILD
LOCATION 13: NOBEL - LACY



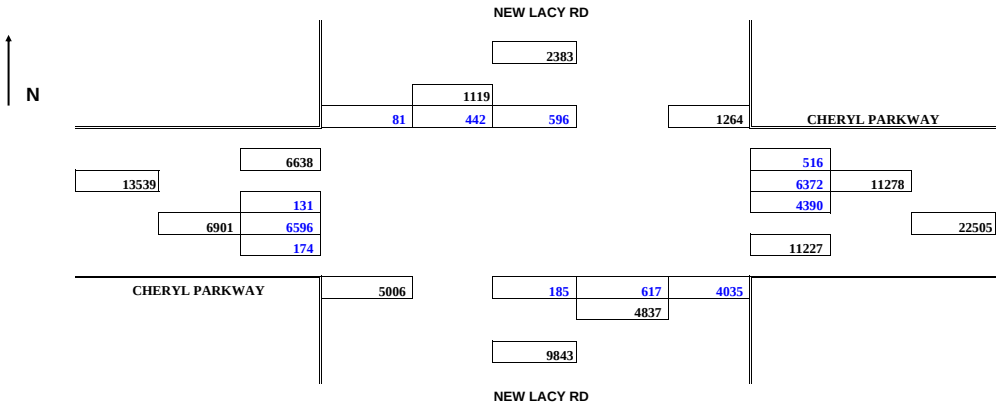
ALT B: 2025 BUILD
LOCATION 14: IRISH - SYENE



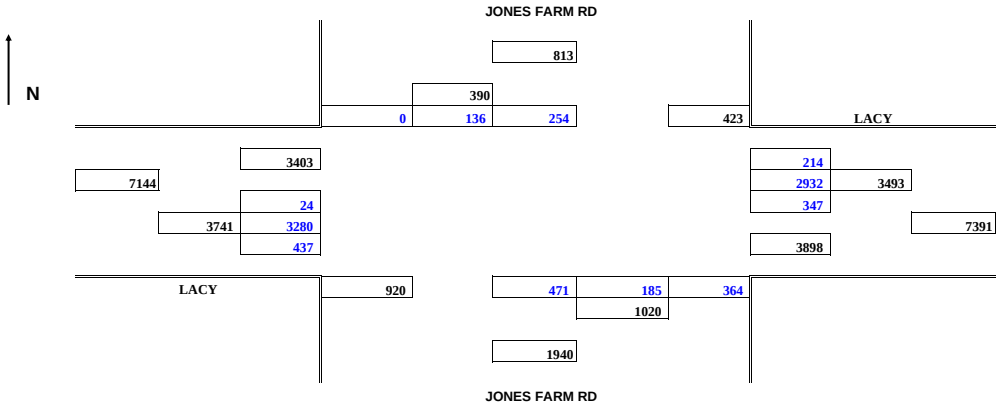
ALT B: 2025 BUILD
LOCATION 15: CHERYL PARKWAY - SYENE



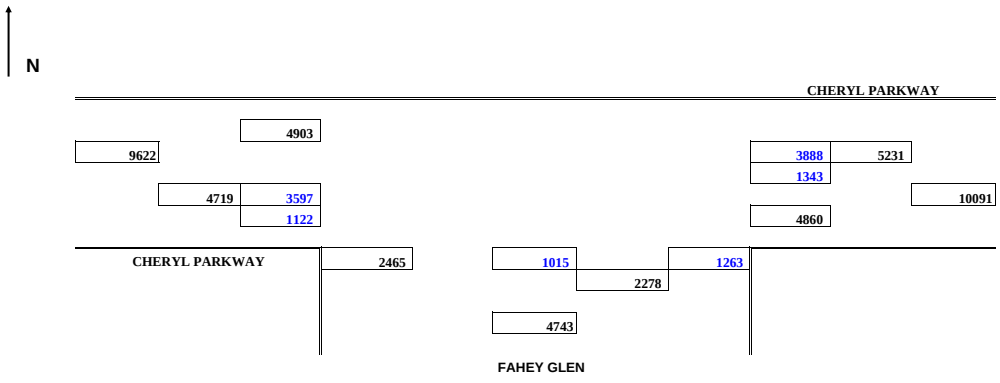
ALT B: 2025 BUILD
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



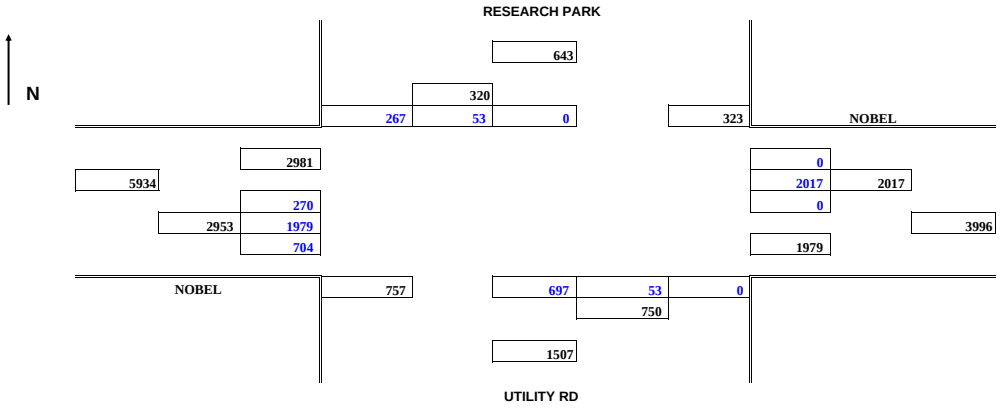
ALT B: 2025 BUILD
LOCATION 17: LACY - JONES FARM RD



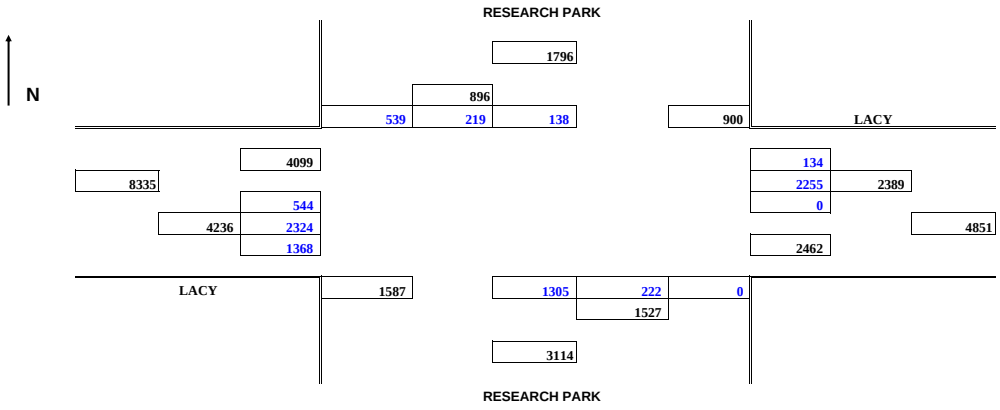
ALT B: 2025 BUILD
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



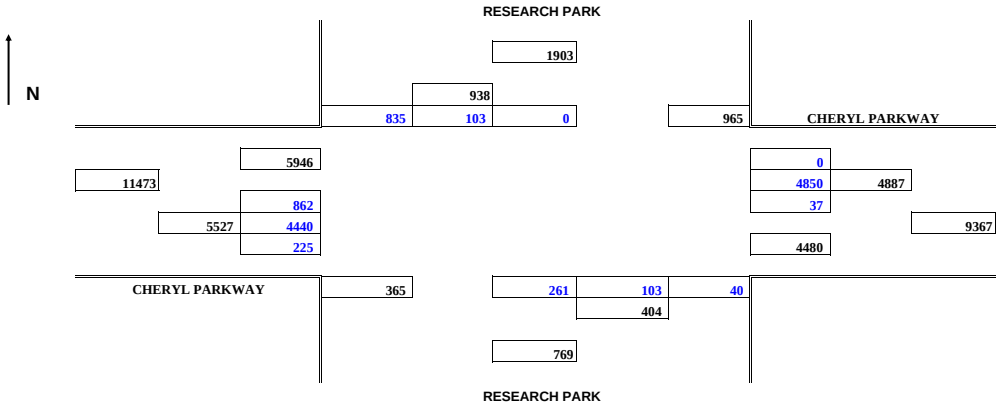
ALT B: 2025 BUILD
LOCATION 19: NOBEL - RESEARCH PARK



ALT B: 2025 BUILD
LOCATION 20: LACY - RESEARCH PARK

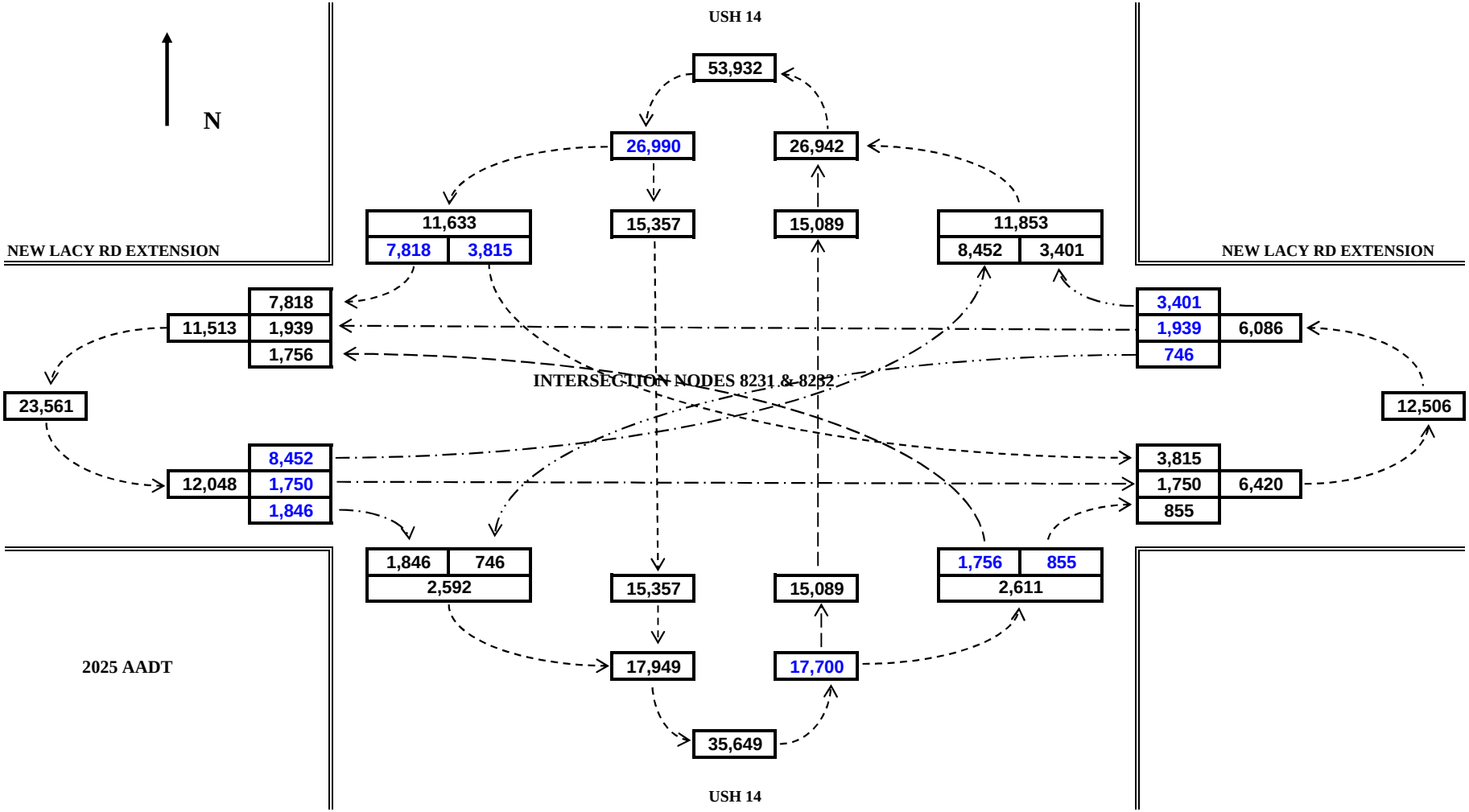


ALT B: 2025 BUILD
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT B: 2025 BUILD

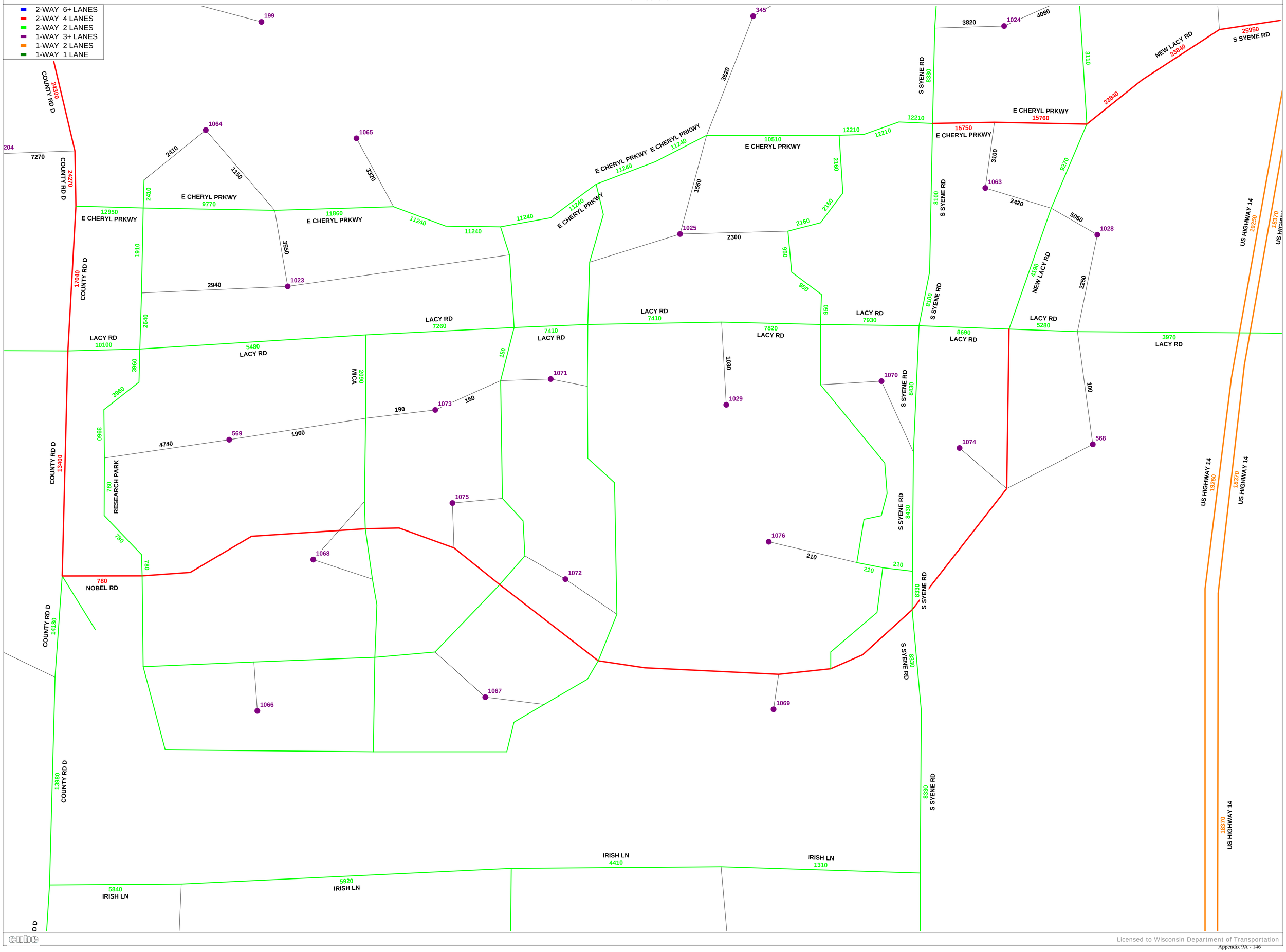
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



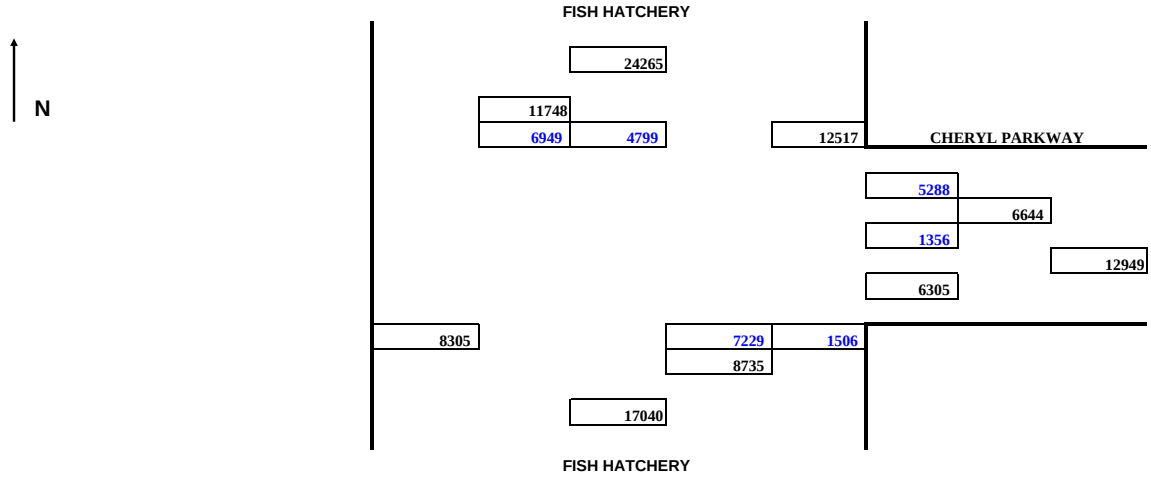
APPENDIX A

MPO Year 2025 Build Traffic ADT Forecasts

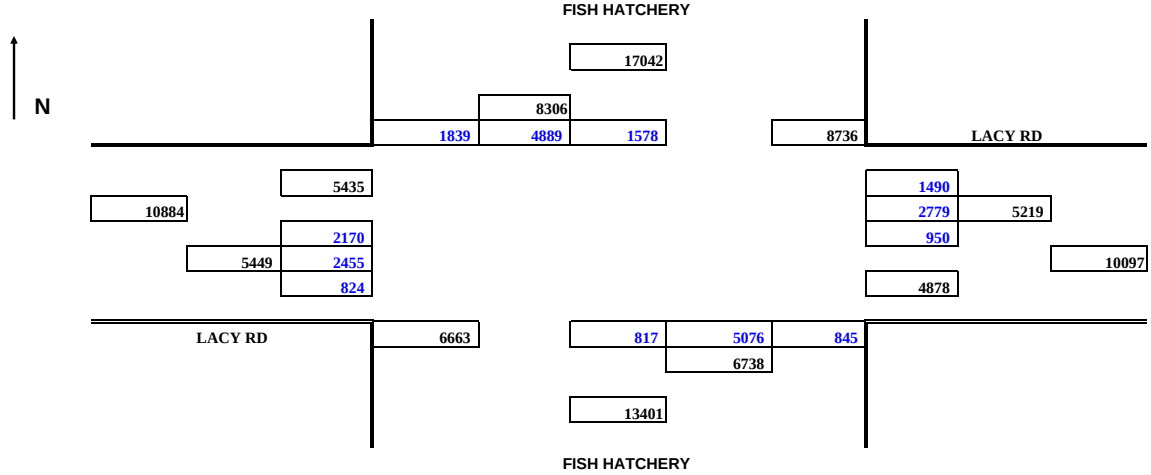
DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT C: 2035 BACKGROUND AADT VOLUMES REVISED 12/18/08
12/18/08



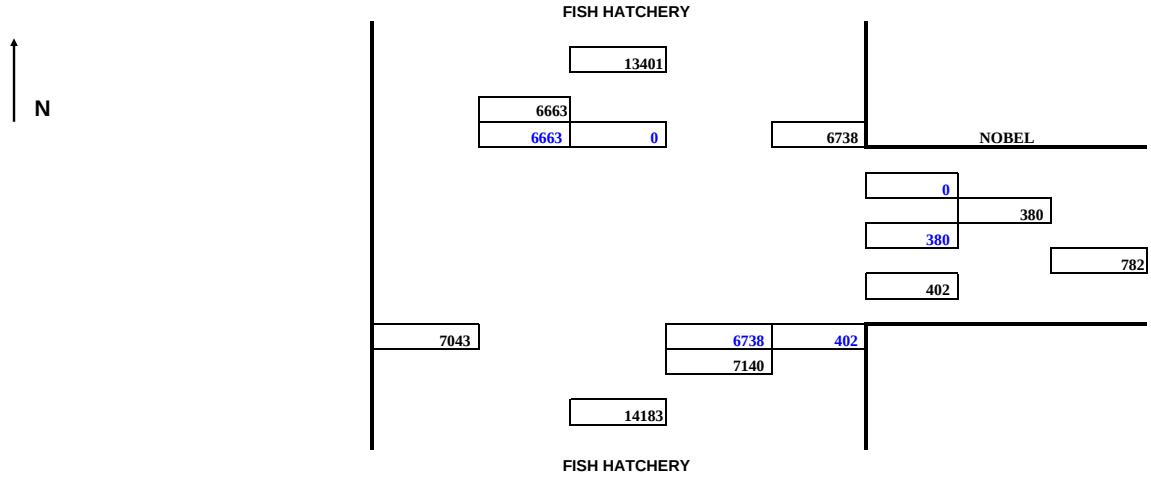
ALT C: 2035 BACKGROUND
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



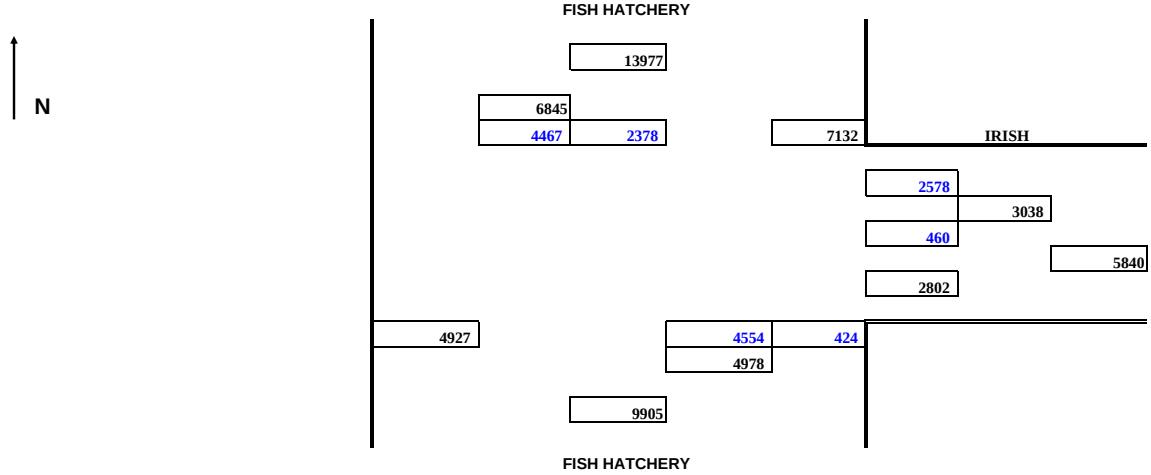
ALT C: 2035 BACKGROUND
LOCATION 2: FISH HATCHERY - LACY



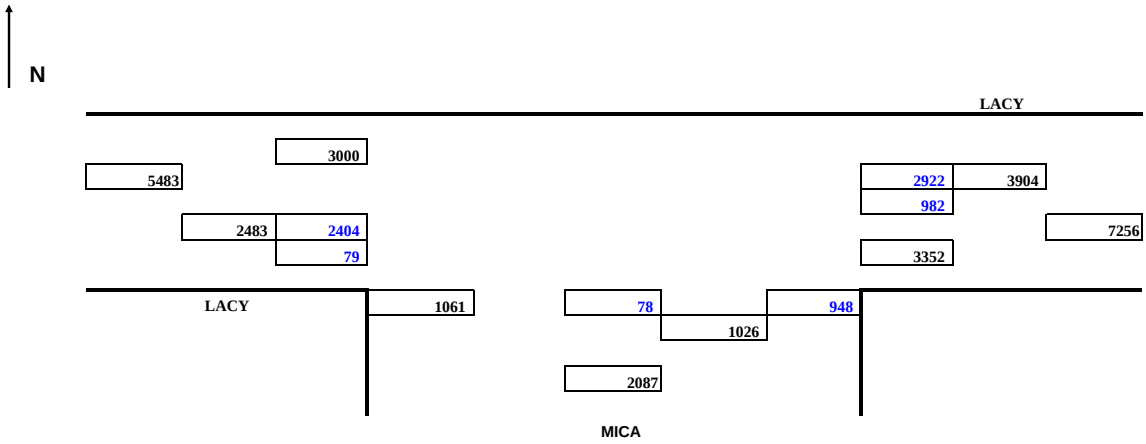
ALT C: 2035 BACKGROUND
LOCATION 3: FISH HATCHERY - NOBEL



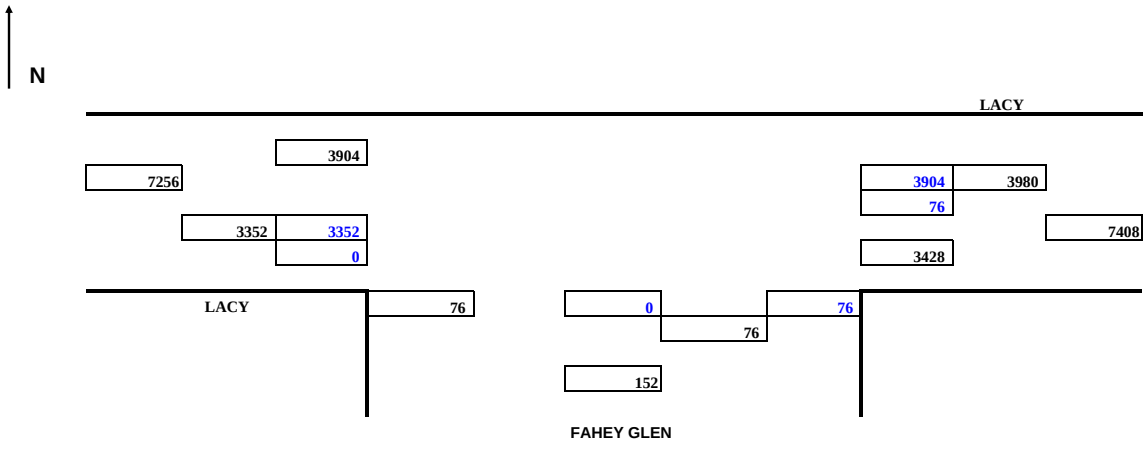
ALT C: 2035 BACKGROUND
LOCATION 4: FISH HATCHERY - IRISH



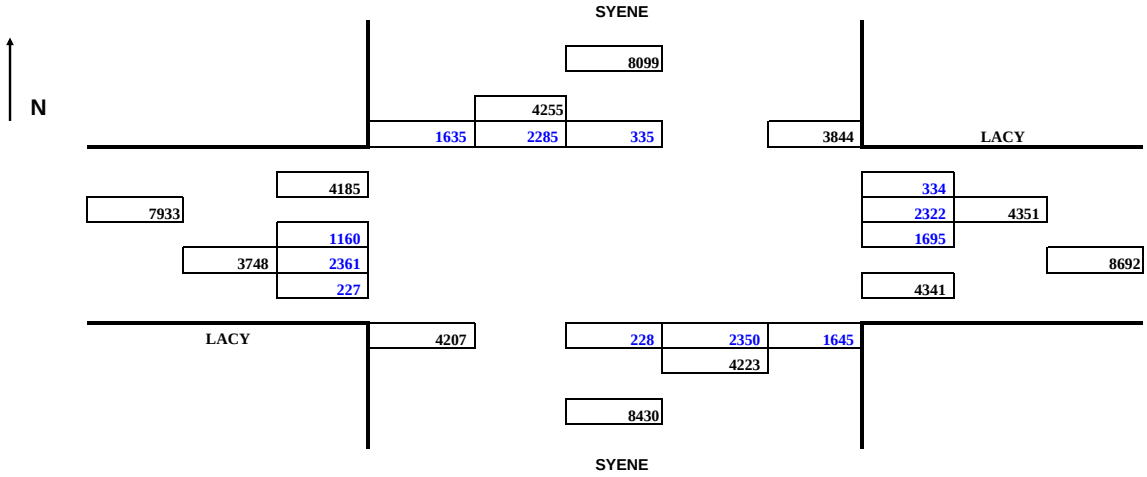
ALT C: 2035 BACKGROUND
LOCATION 6: LACY - MICA



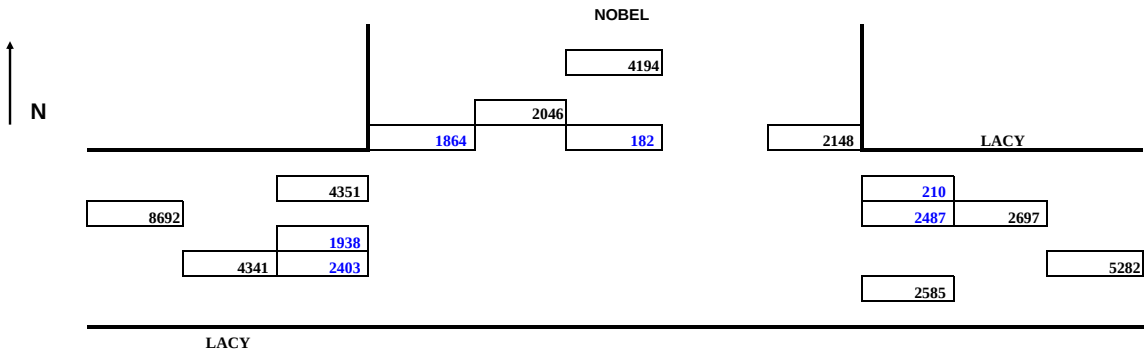
ALT C: 2035 BACKGROUND
LOCATION 8: LACY - FAHEY GLEN



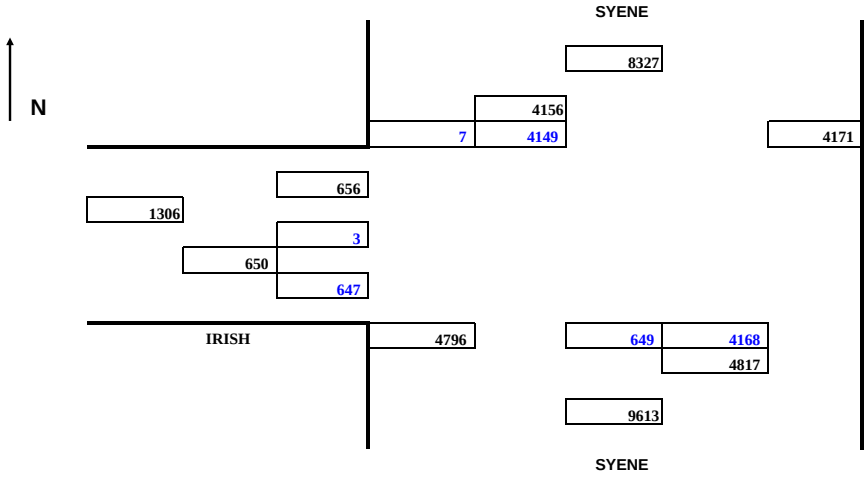
ALT C: 2035 BACKGROUND
LOCATION 12: LACY - SYENE



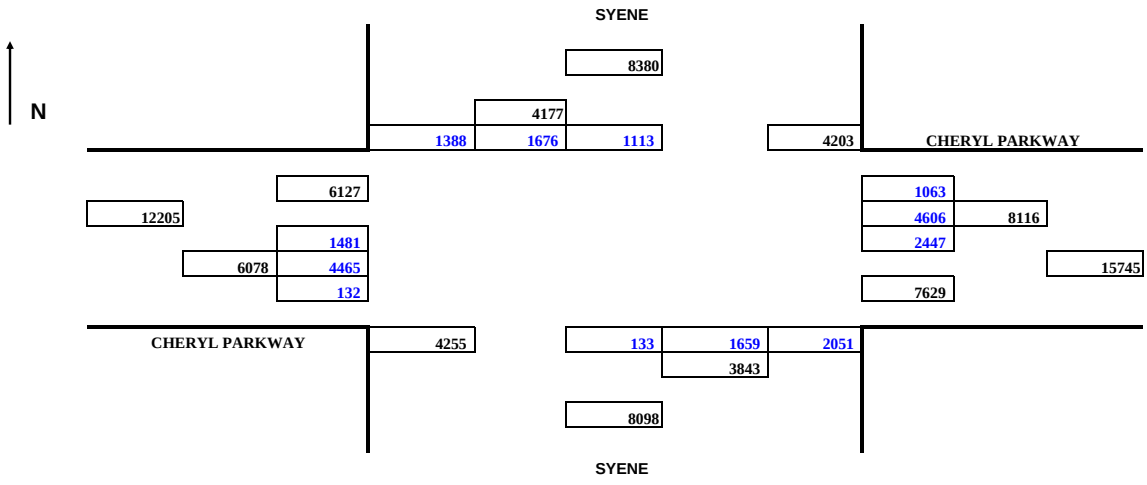
ALT C: 2035 BACKGROUND
LOCATION 13: NOBEL - LACY



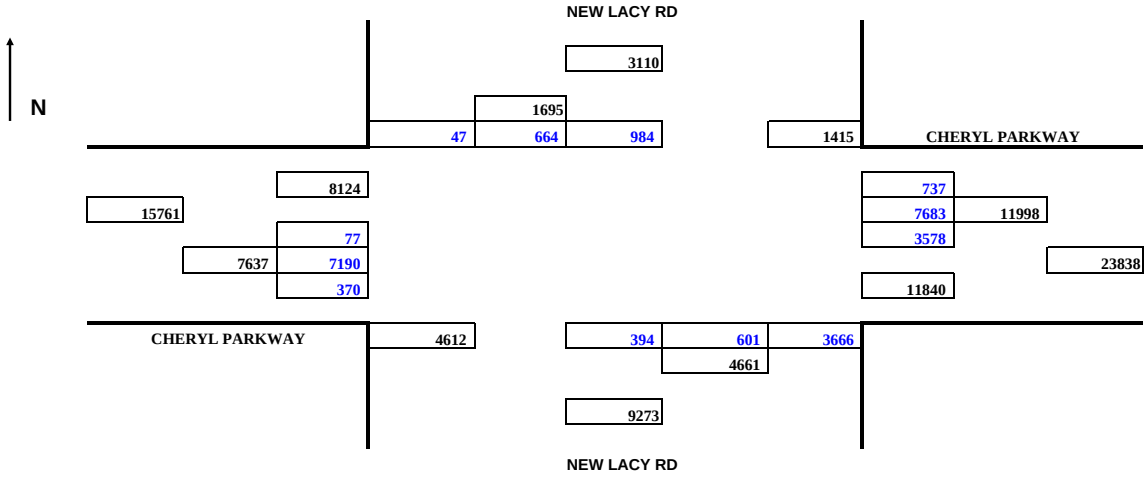
ALT C: 2035 BACKGROUND
LOCATION 14: IRISH - SYENE



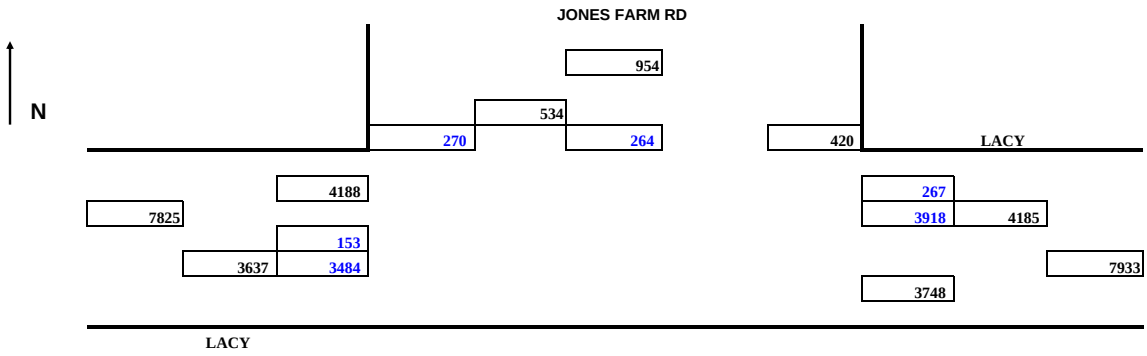
ALT C: 2035 BACKGROUND
LOCATION 15: CHERYL PARKWAY - SYENE



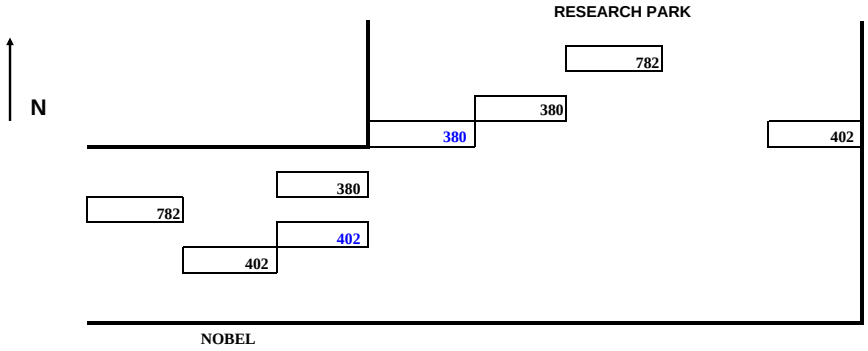
ALT C: 2035 BACKGROUND
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



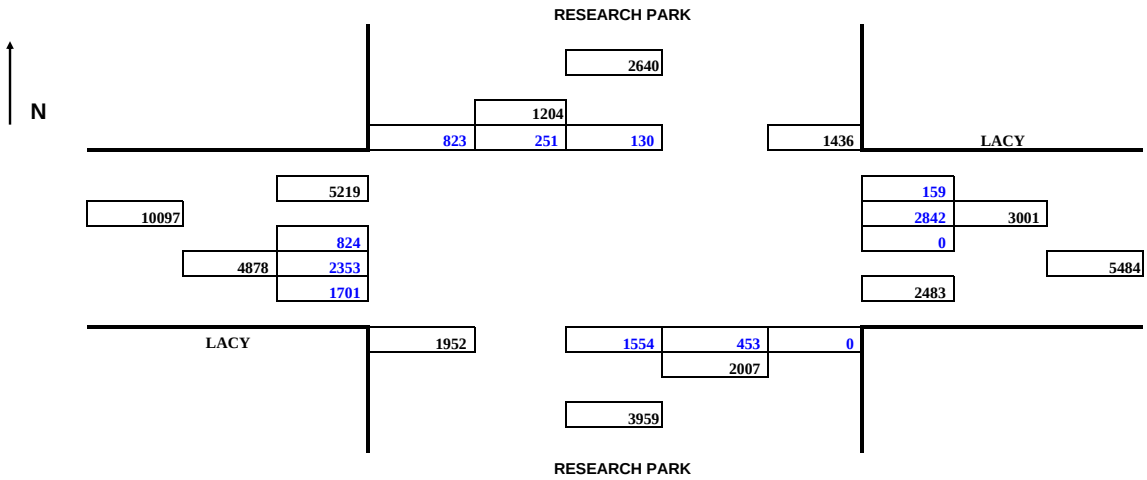
ALT C: 2035 BACKGROUND
LOCATION 17: LACY - JONES FARM RD



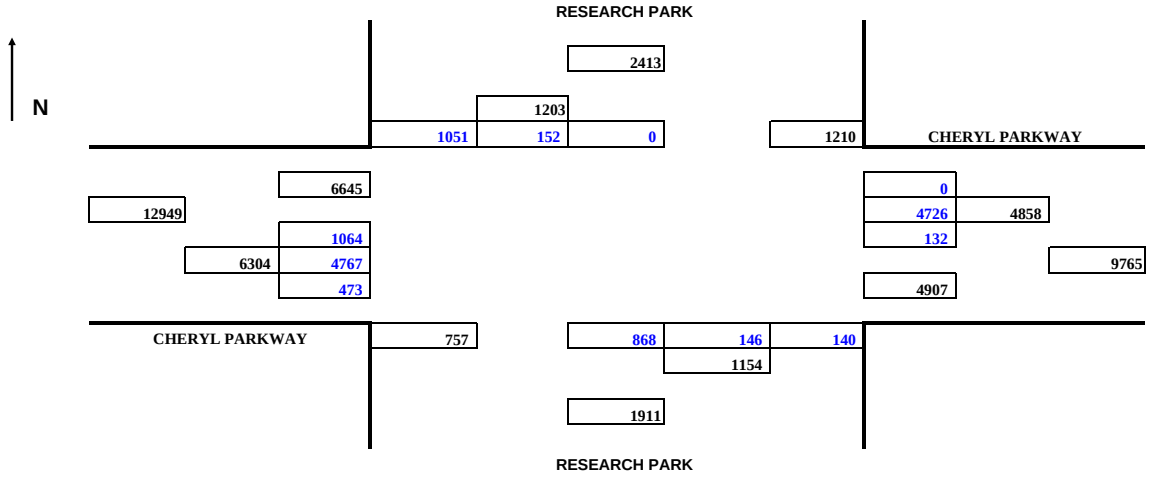
ALT C: 2035 BACKGROUND
LOCATION 19: NOBEL - RESEARCH PARK



ALT C: 2035 BACKGROUND
LOCATION 20: LACY - RESEARCH PARK

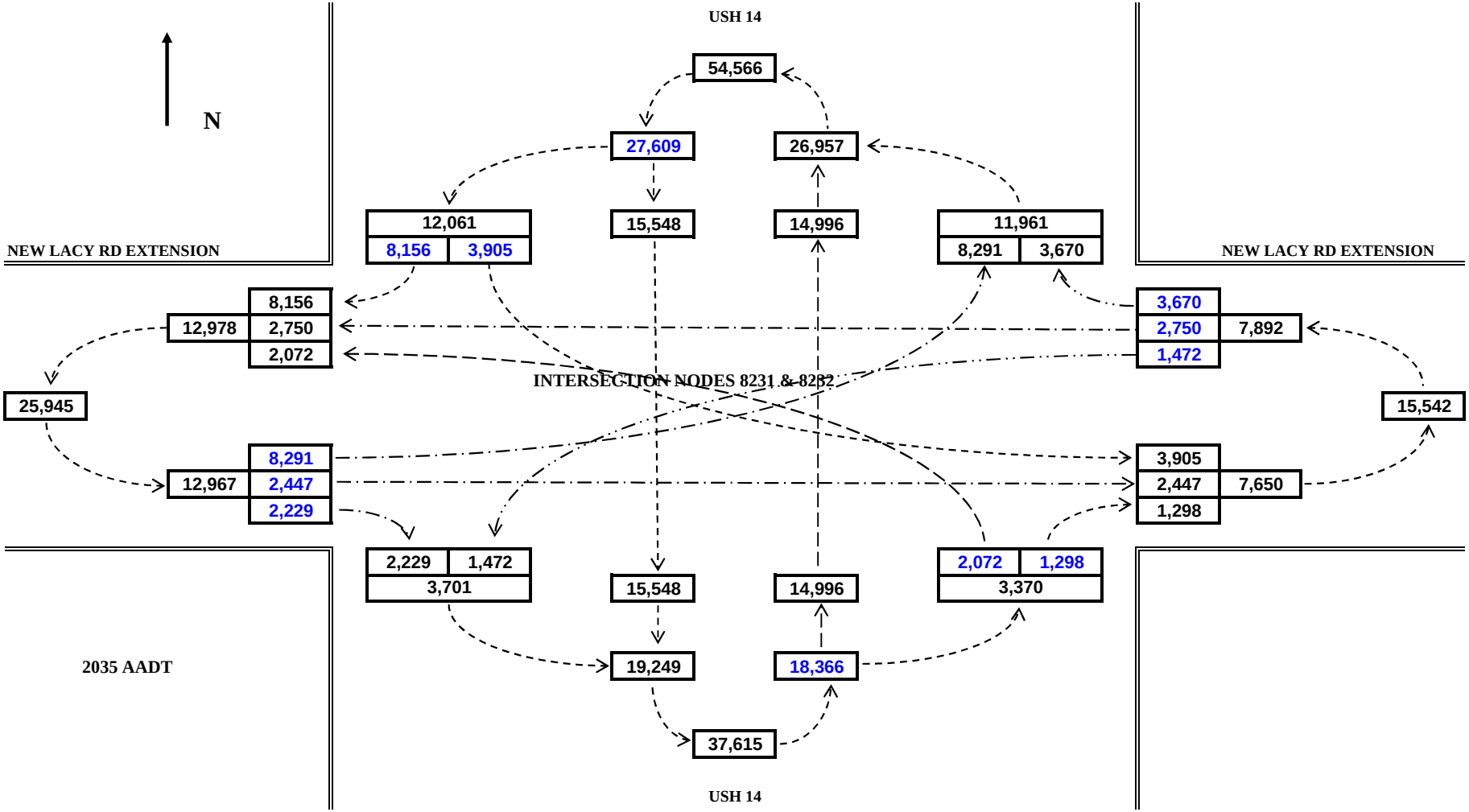


ALT C: 2035 BACKGROUND
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT C: 2035 BACKGROUND

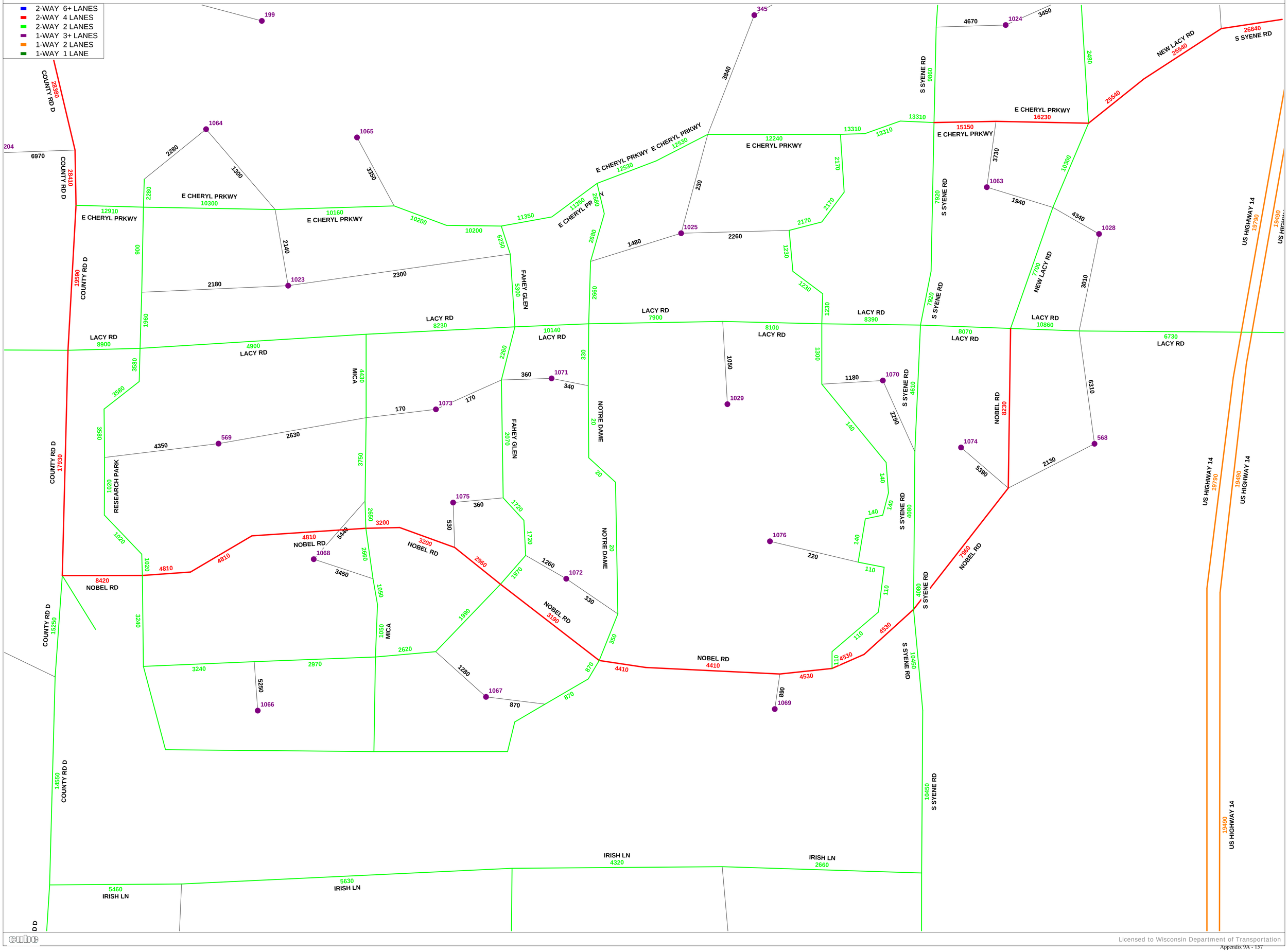
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



APPENDIX A

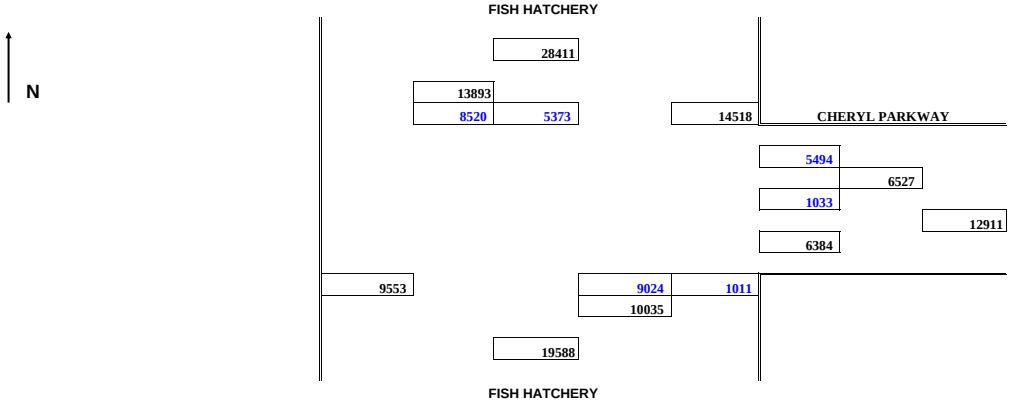
MPO Year 2035 Build Traffic ADT Forecasts

DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT D: 2035 COMPLETE BUILDOUT AADT VOLUMES REVISED 12/18/08
12/18/08

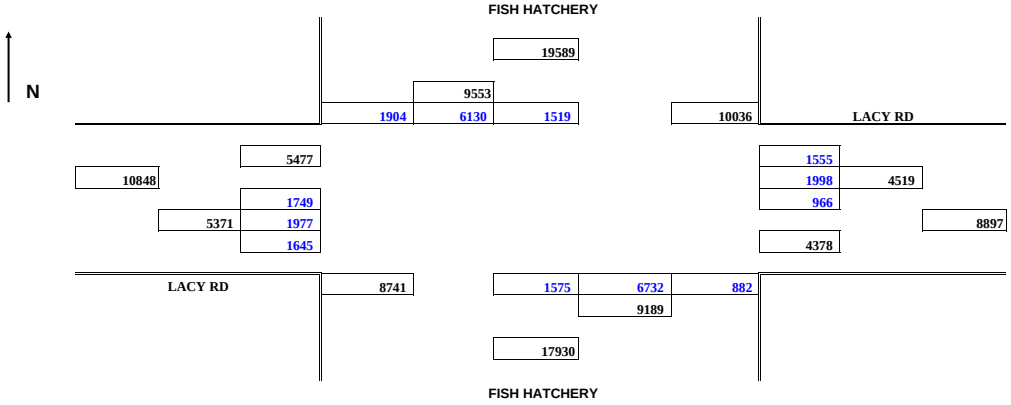


cube
Licensed to Wisconsin Department of Transportation

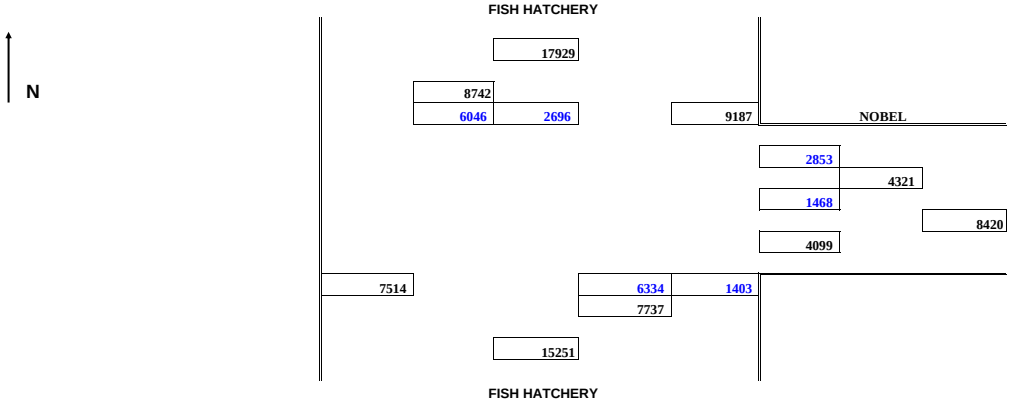
ALT D: 2035 BUILDOUT
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



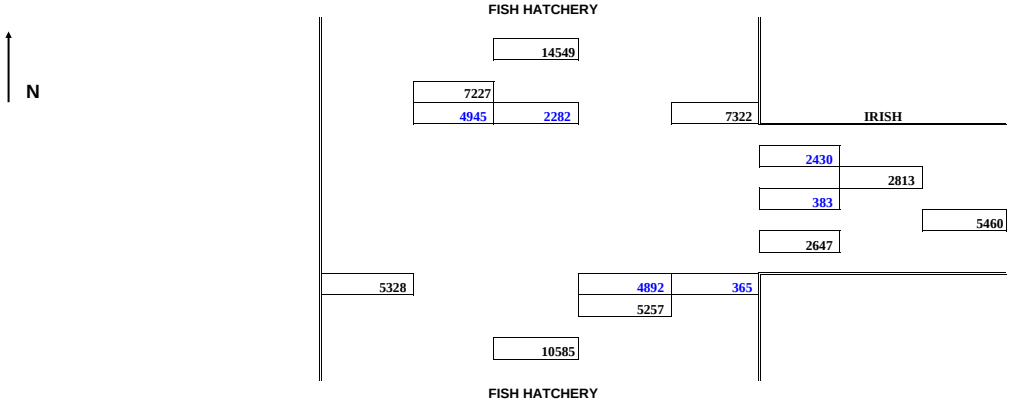
ALT D: 2035 BUILDOUT
LOCATION 2: FISH HATCHERY - LACY



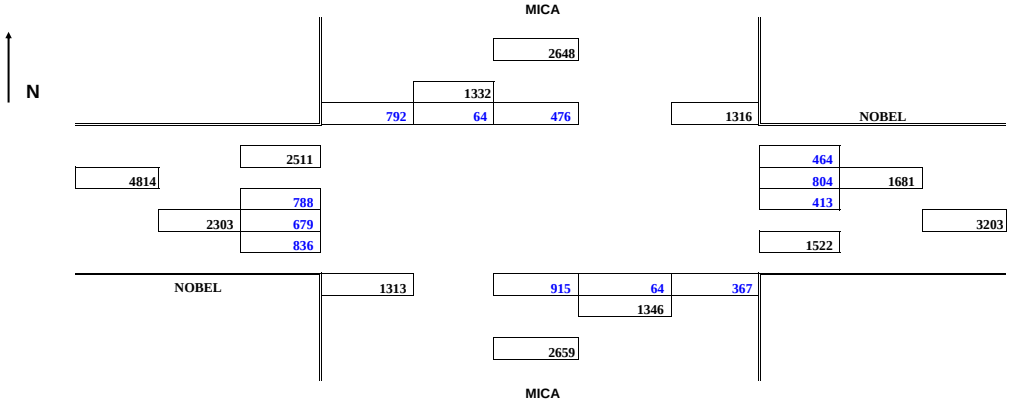
ALT D: 2035 BUILDOUT
LOCATION 3: FISH HATCHERY - NOBEL



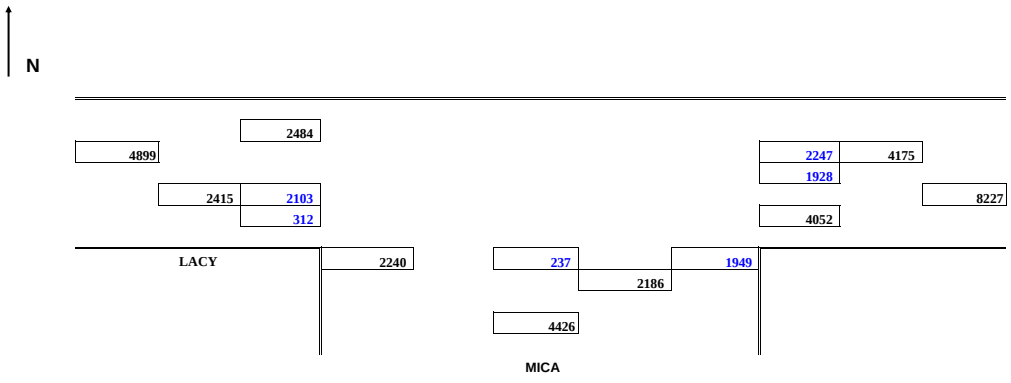
ALT D: 2035 BUILDOUT
LOCATION 4: FISH HATCHERY - IRISH



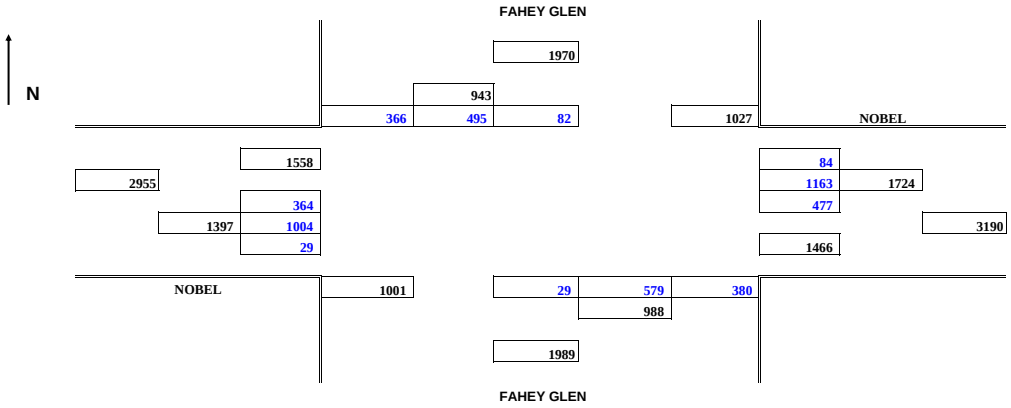
ALT D: 2035 BUILDOUT
LOCATION 5: NOBEL - MICA



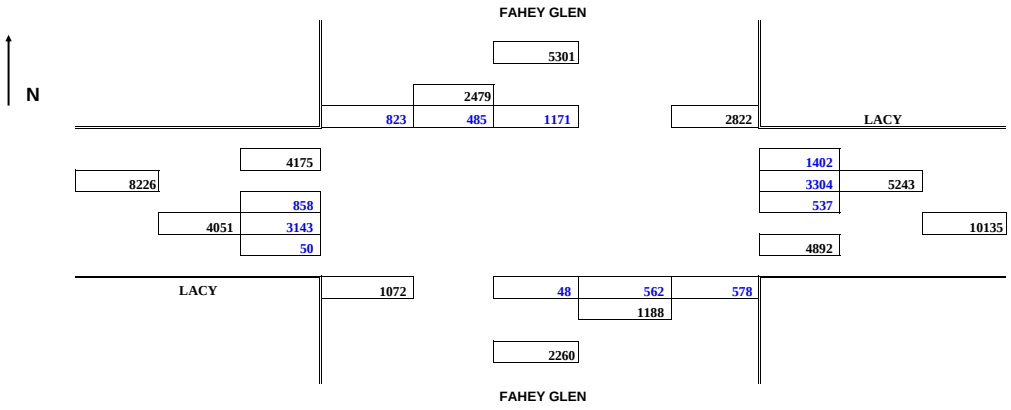
ALT D: 2035 BUILDOUT
LOCATION 6: LACY - MICA



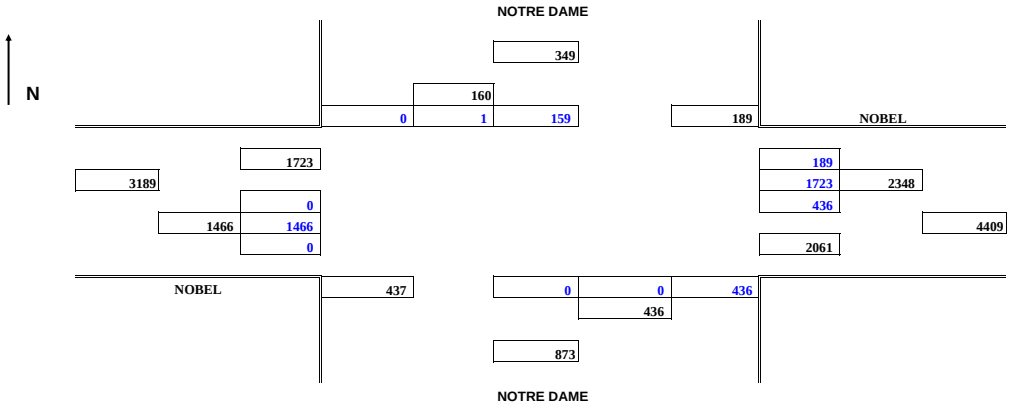
ALT D: 2035 BUILDOUT
LOCATION 7: NOBEL - FAHEY GLEN



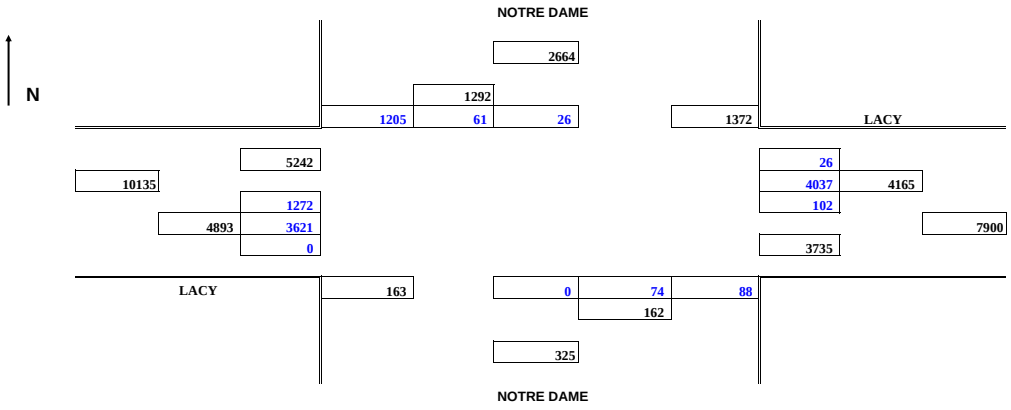
ALT D: 2035 BUILDOUT
LOCATION 8: LACY - FAHEY GLEN



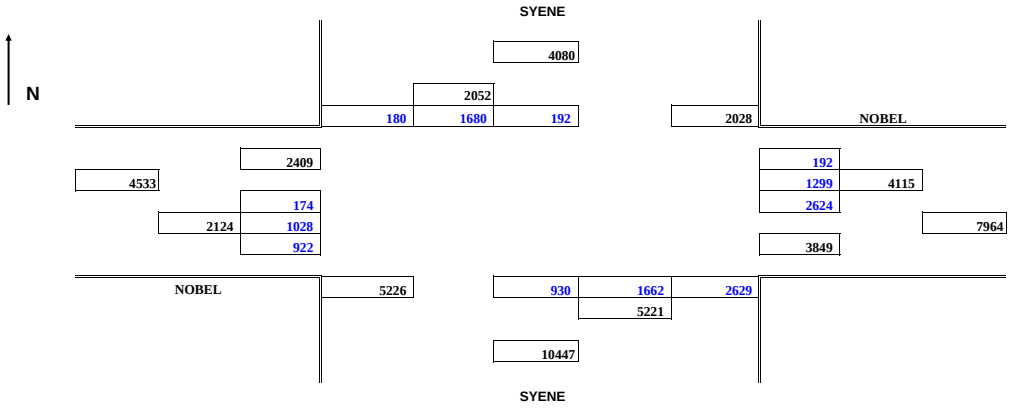
ALT D: 2035 BUILDOUT
LOCATION 9: NOBEL - NOTRE DAME



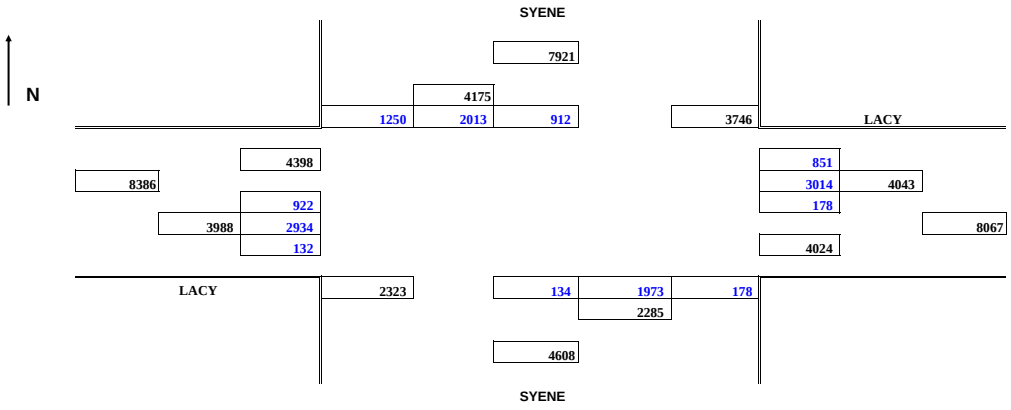
ALT D: 2035 BUILDOUT
LOCATION 10: LACY - NOTRE DAME



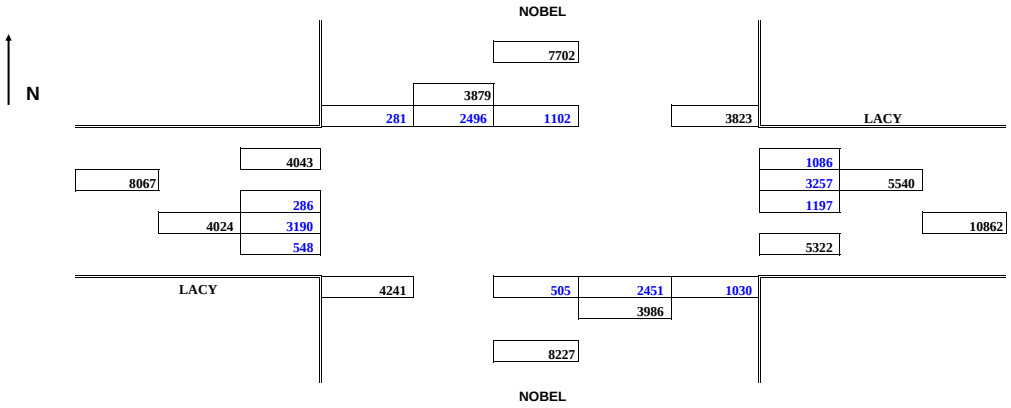
ALT D: 2035 BUILDOUT
LOCATION 11: NOBEL - SYENE



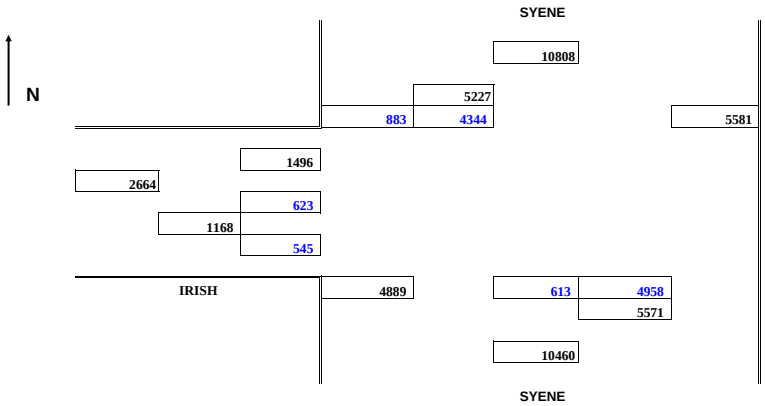
ALT D: 2035 BUILDOUT
LOCATION 12: LACY - SYENE



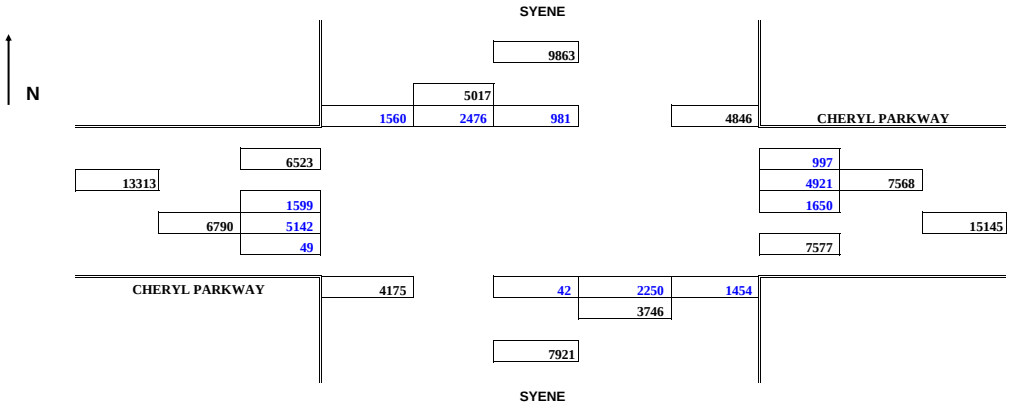
ALT D: 2035 BUILDOUT
LOCATION 13: NOBEL - LACY



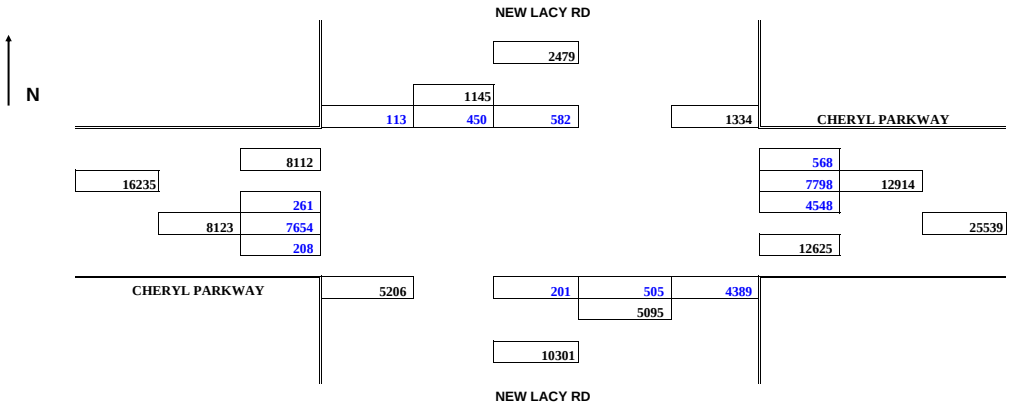
ALT D: 2035 BUILDOUT
LOCATION 14: IRISH - SYENE



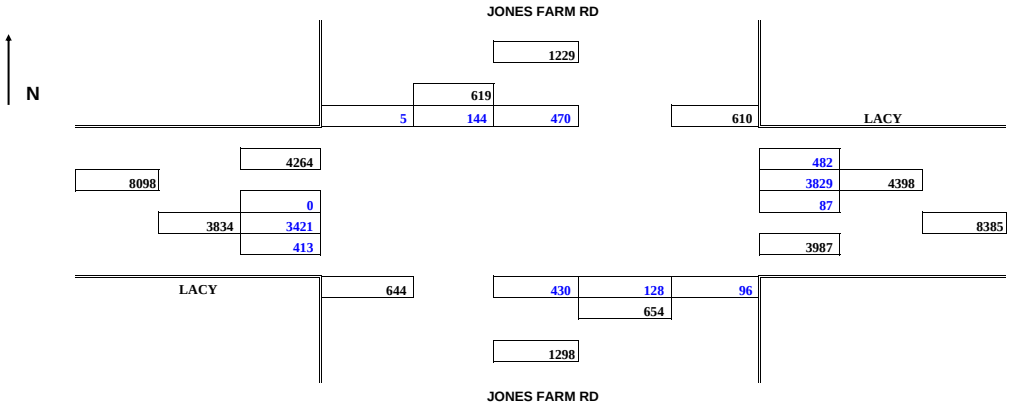
ALT D: 2035 BUILDOUT
LOCATION 15: CHERYL PARKWAY - SYENE



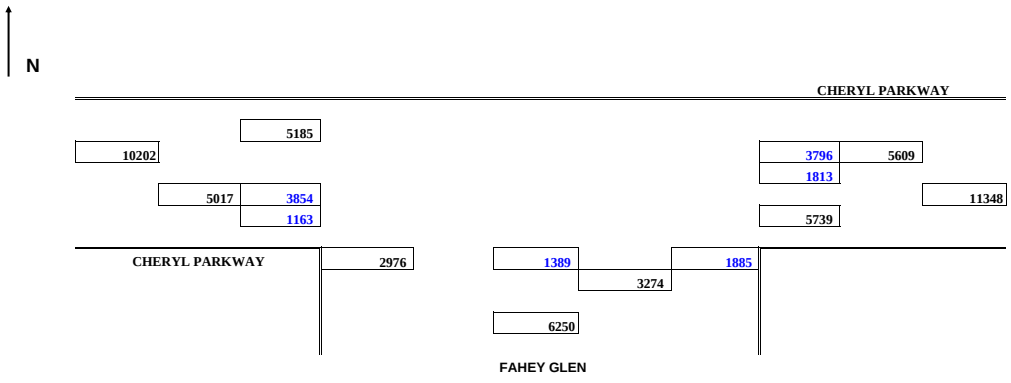
ALT D: 2035 BUILDOUT
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



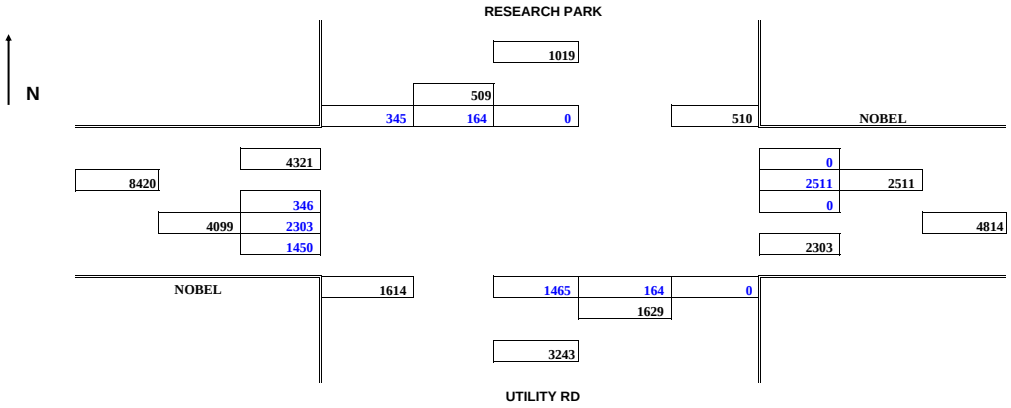
ALT D: 2035 BUILDOUT
LOCATION 17: LACY - JONES FARM RD



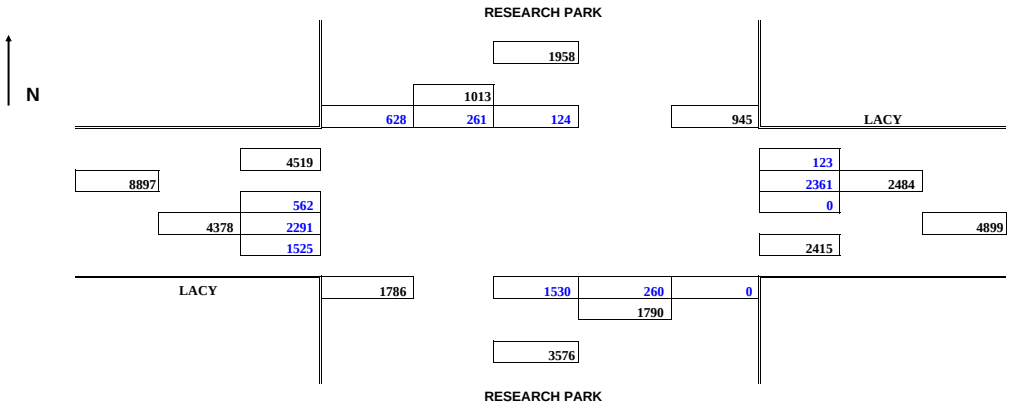
ALT D: 2035 BUILDOUT
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



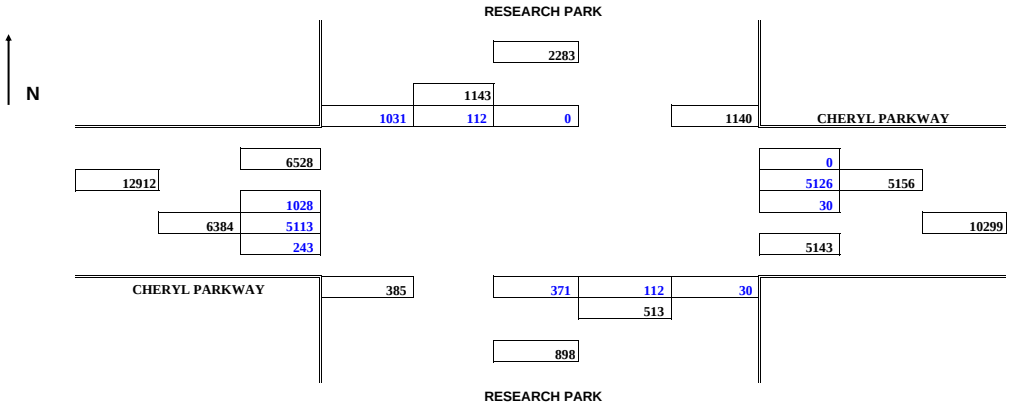
ALT D: 2035 BUILDOUT
LOCATION 19: NOBEL - RESEARCH PARK



ALT D: 2035 BUILDOUT
LOCATION 20: LACY - RESEARCH PARK

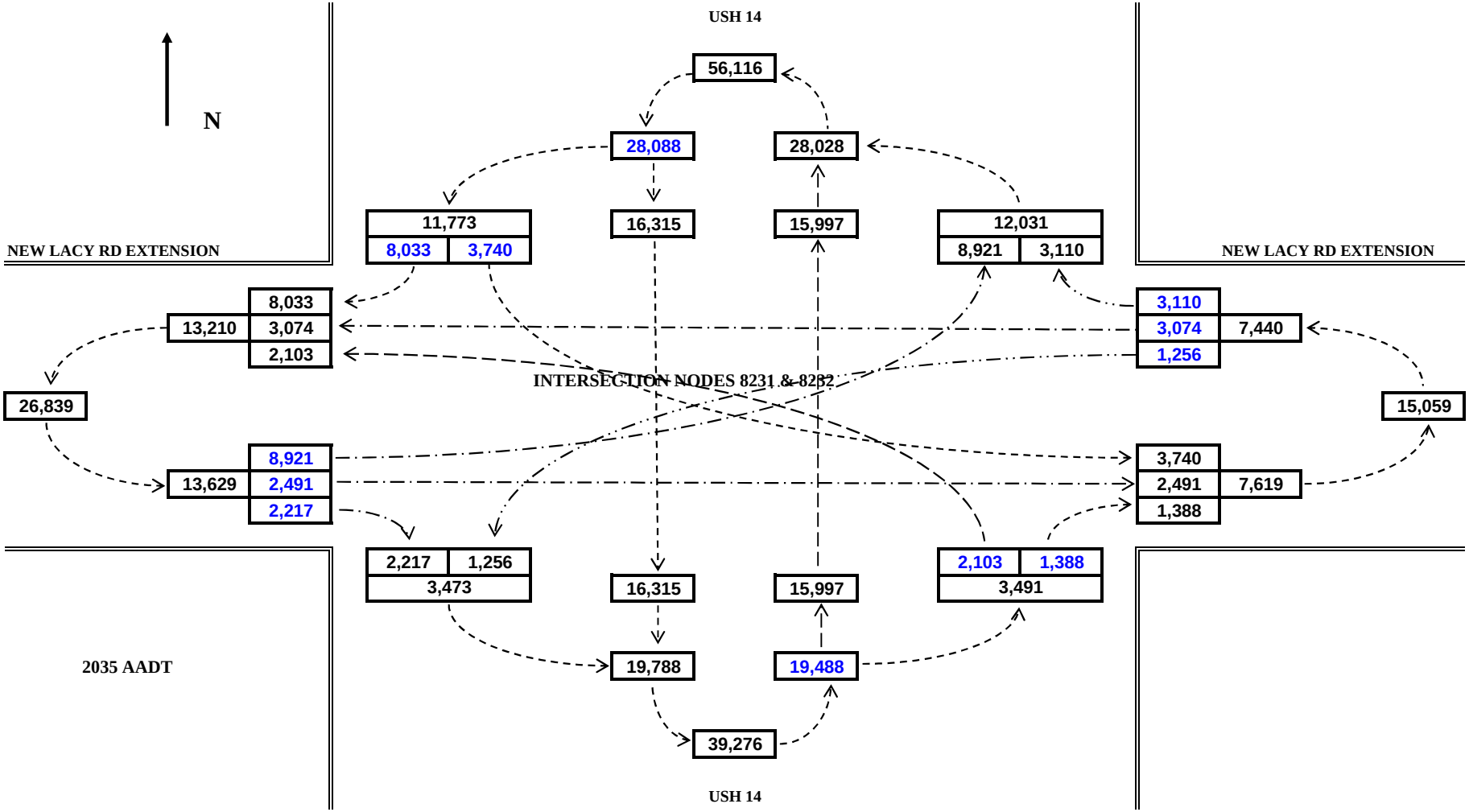


ALT D: 2035 BUILDOUT
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK

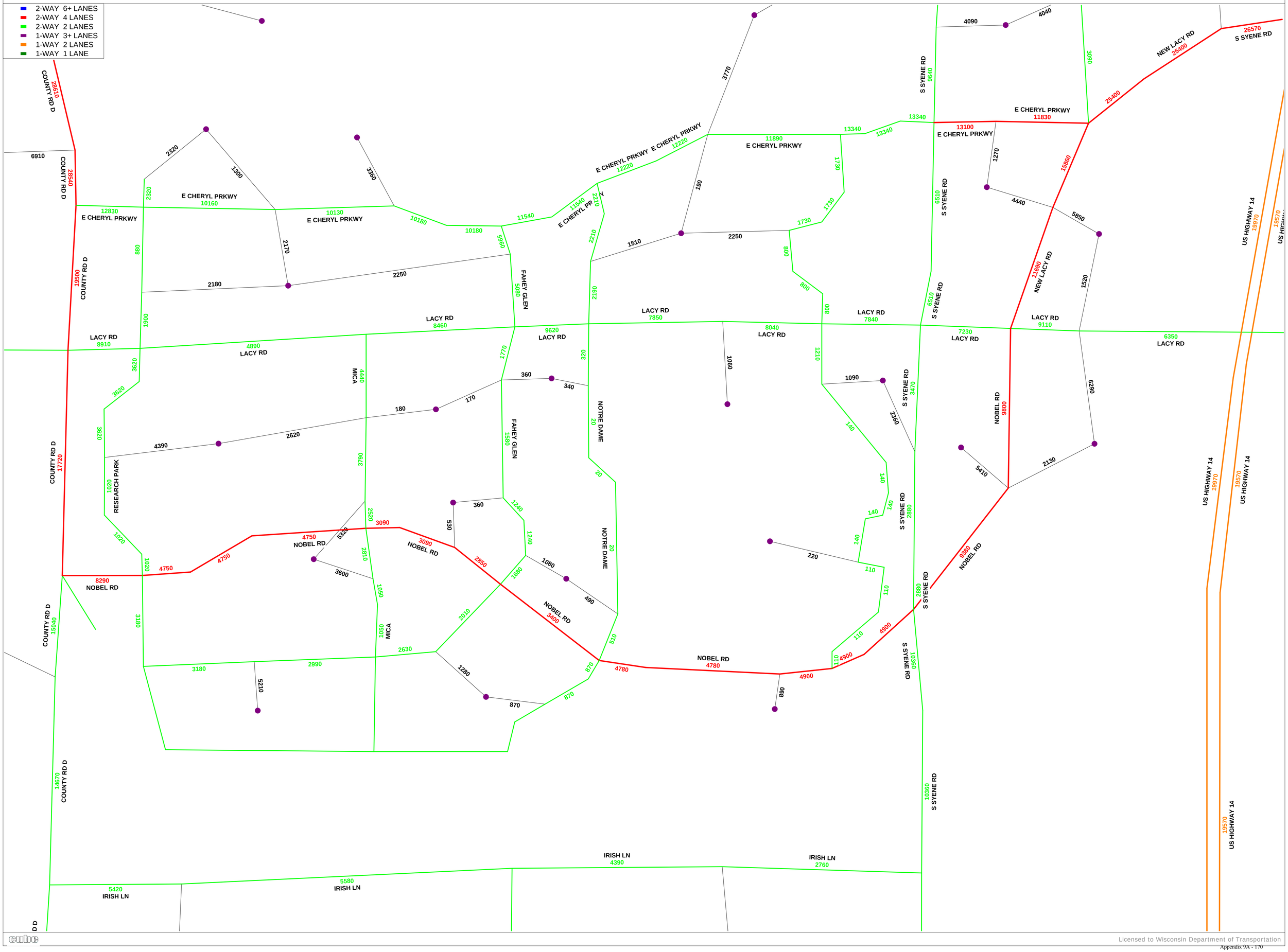


ALT D: 2035 BUILDOUT

LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT D-2: 2035 COMPLETE BUILDOUT AADT VOLUMES WITH 4-LANE NEW LACY RD SECTION REVISED 12/18/08
12/18/08



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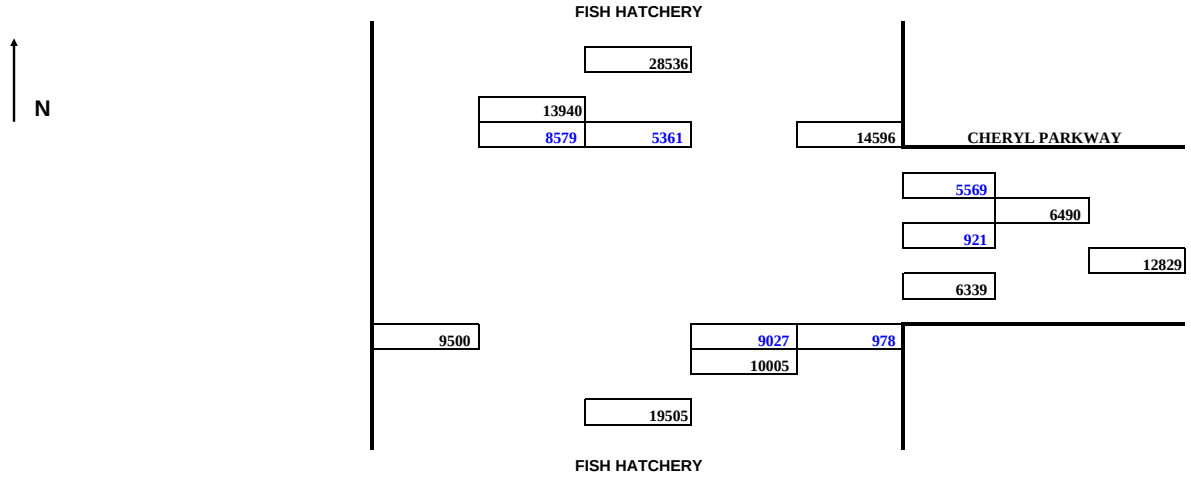
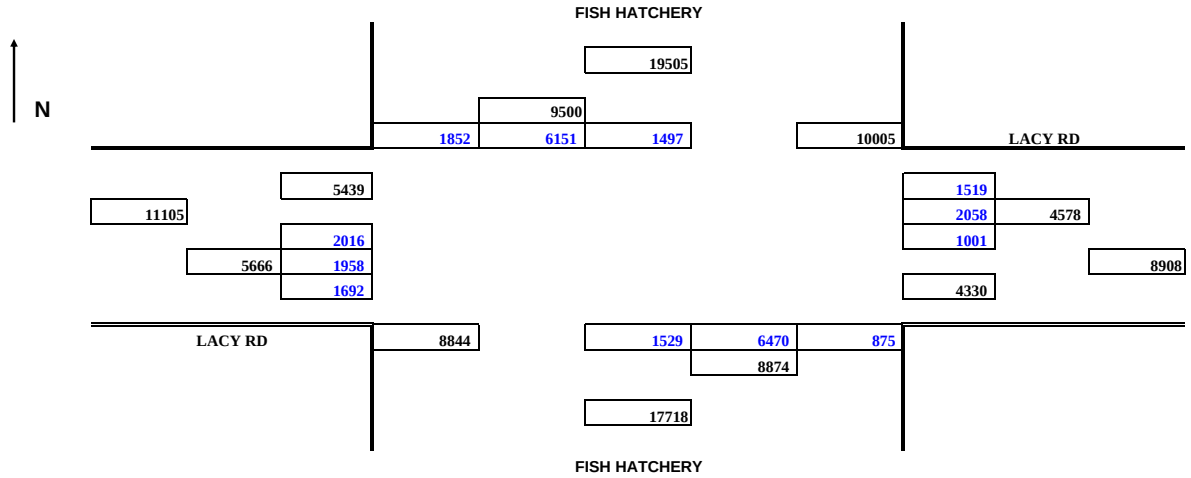
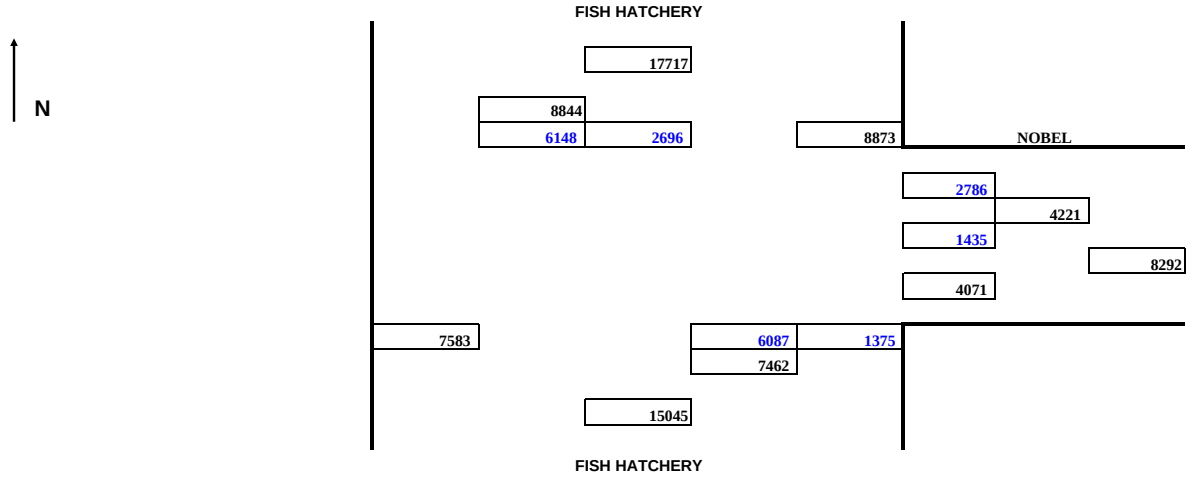
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



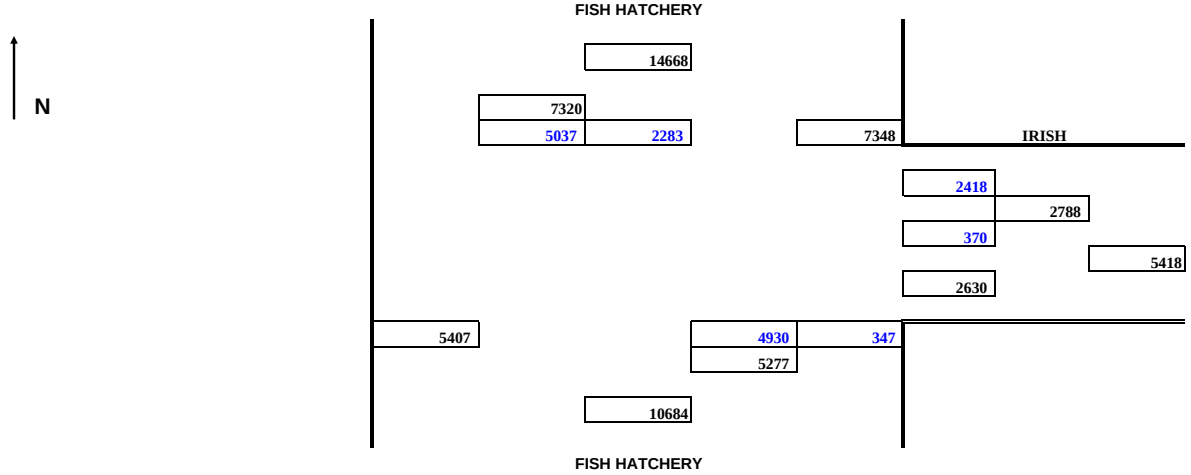
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 2: FISH HATCHERY - LACY



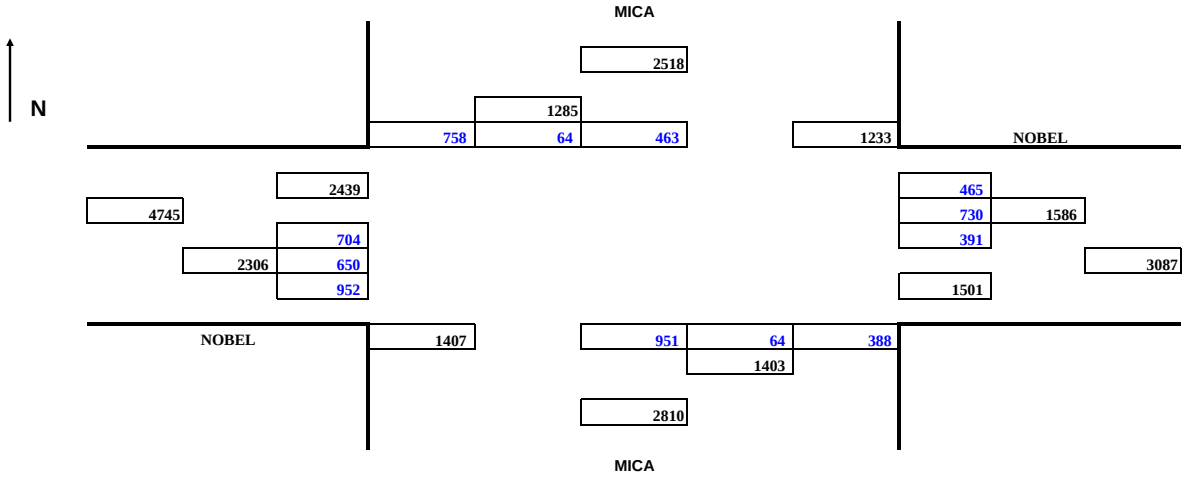
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 3: FISH HATCHERY - NOBEL



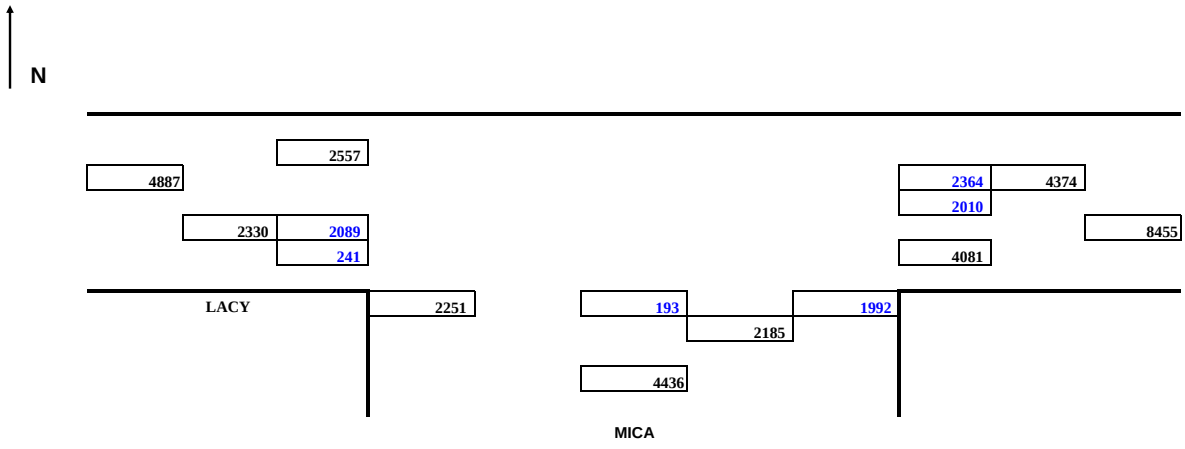
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 4: FISH HATCHERY - IRISH



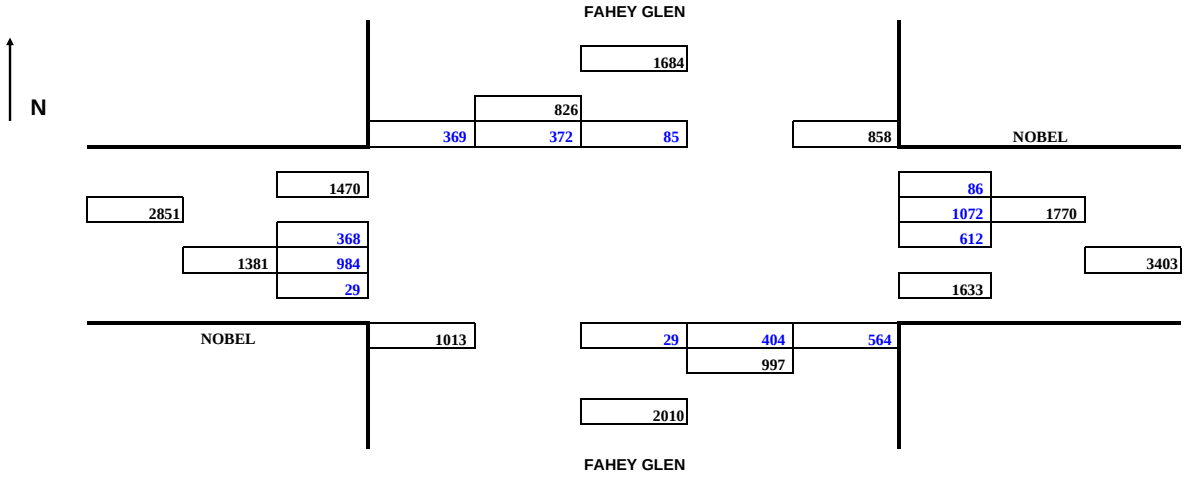
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 5: NOBEL - MICA



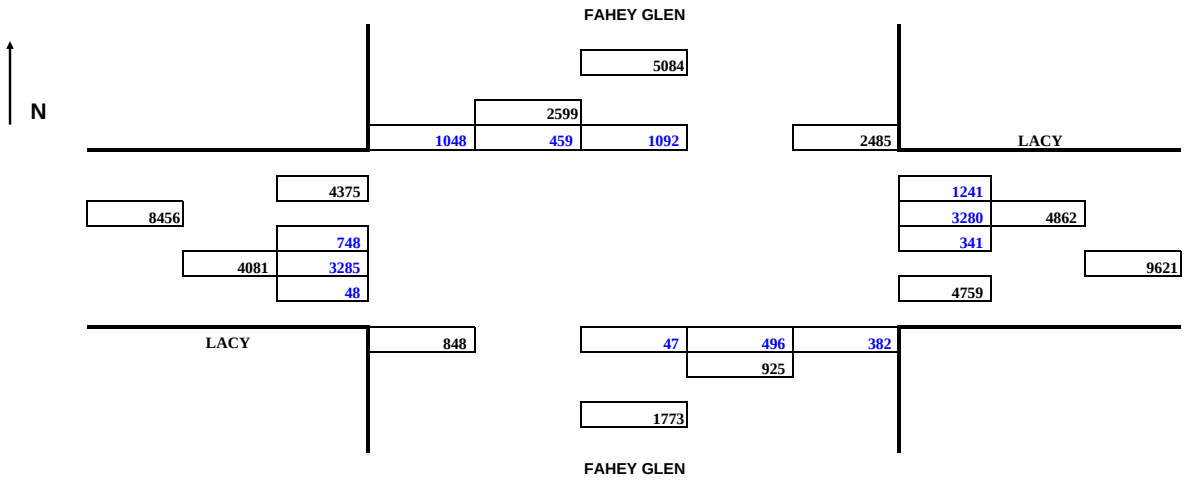
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 6: LACY - MICA



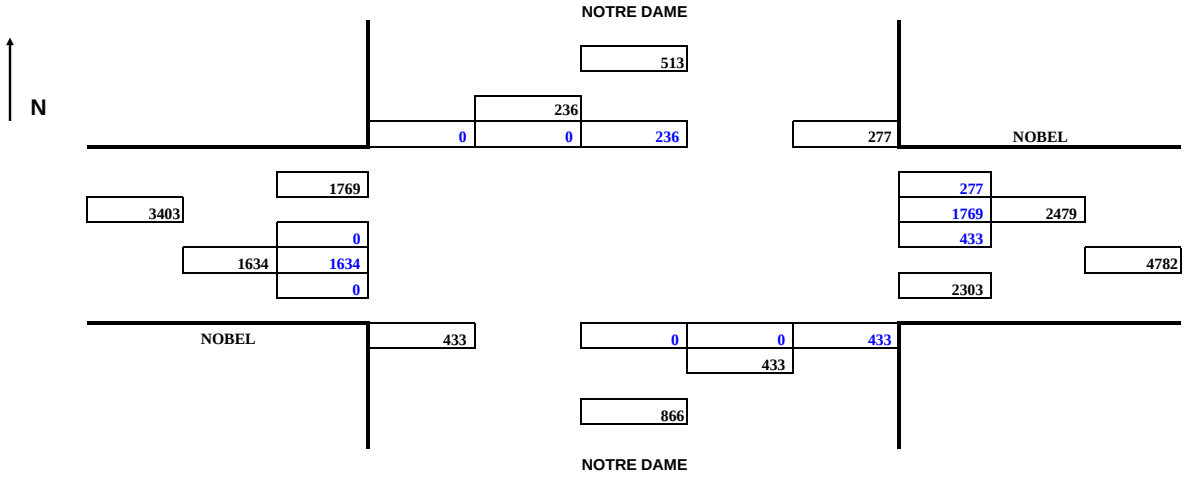
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 7: NOBEL - FAHEY GLEN



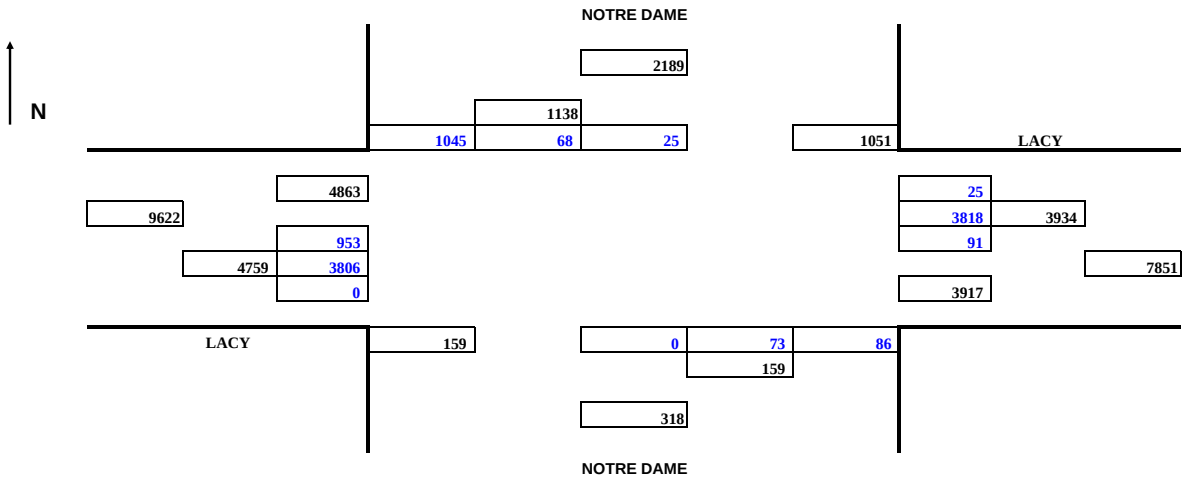
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 8: LACY - FAHEY GLEN



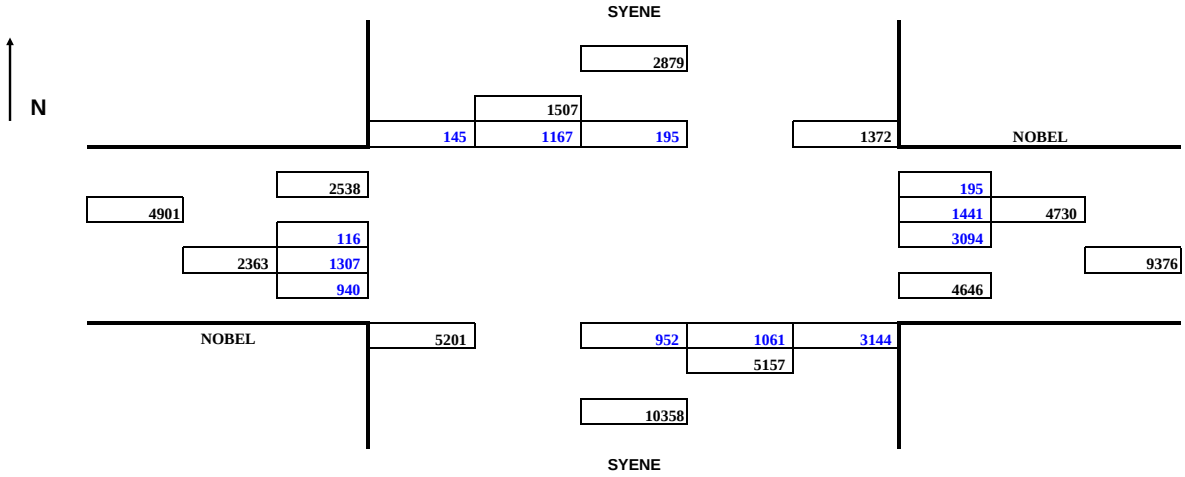
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 9: NOBEL - NOTRE DAME



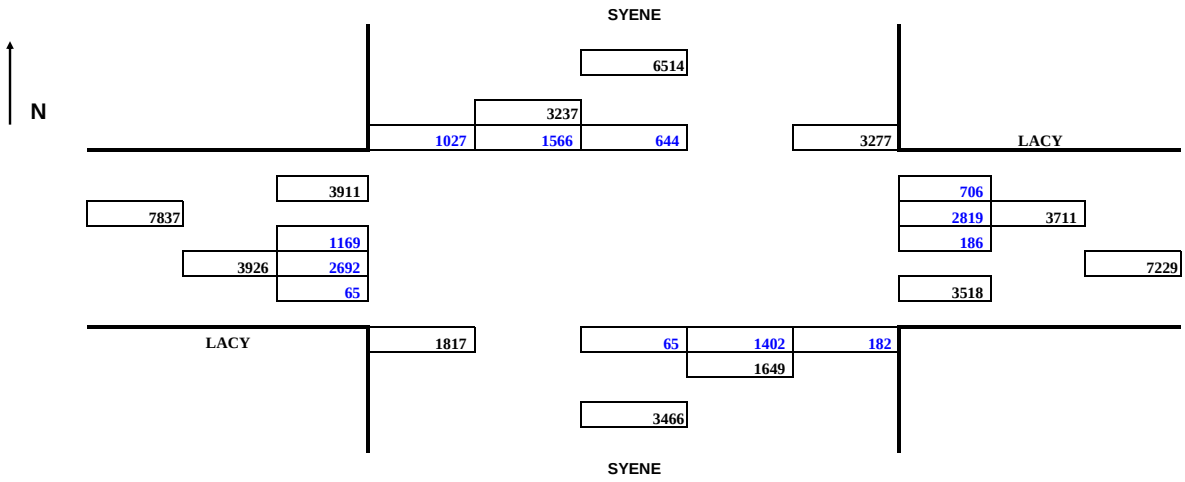
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 10: LACY - NOTRE DAME



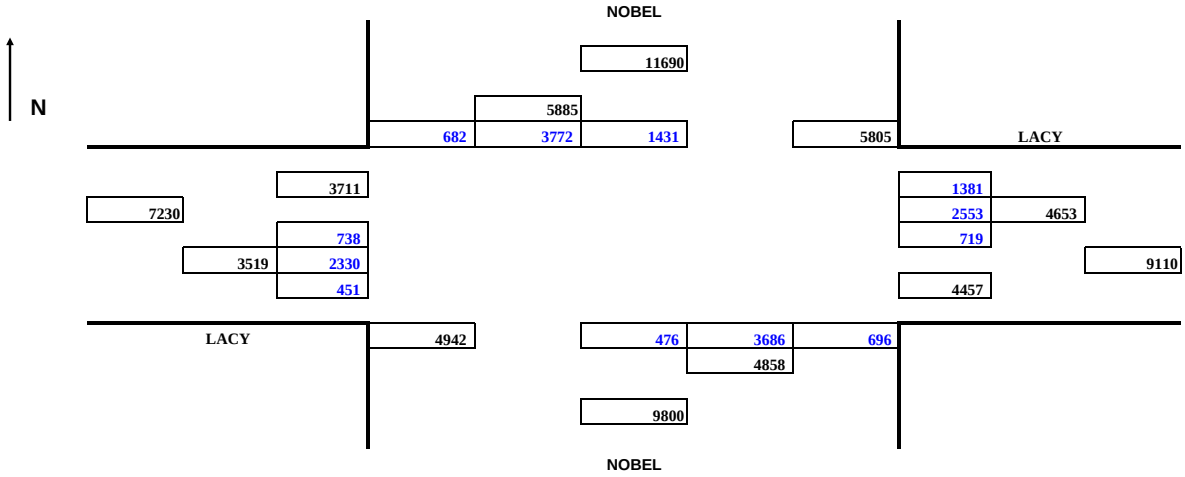
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 11: NOBEL - SYENE



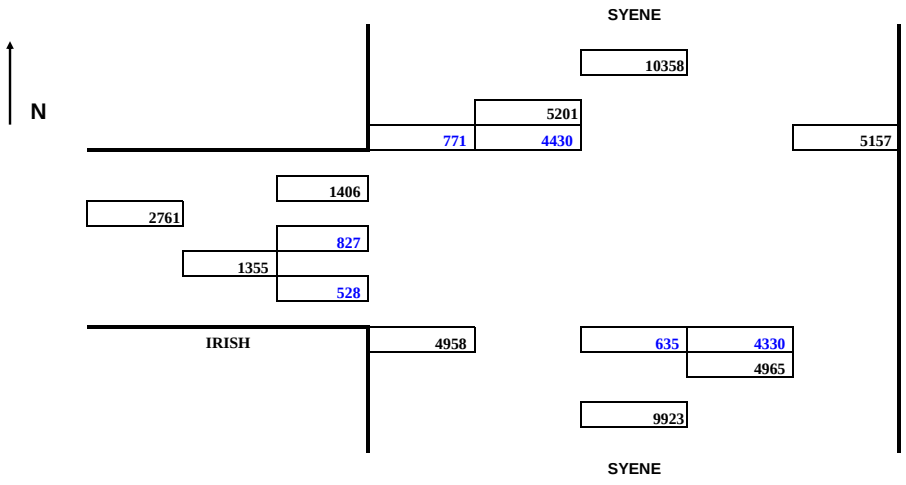
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 12: LACY - SYENE



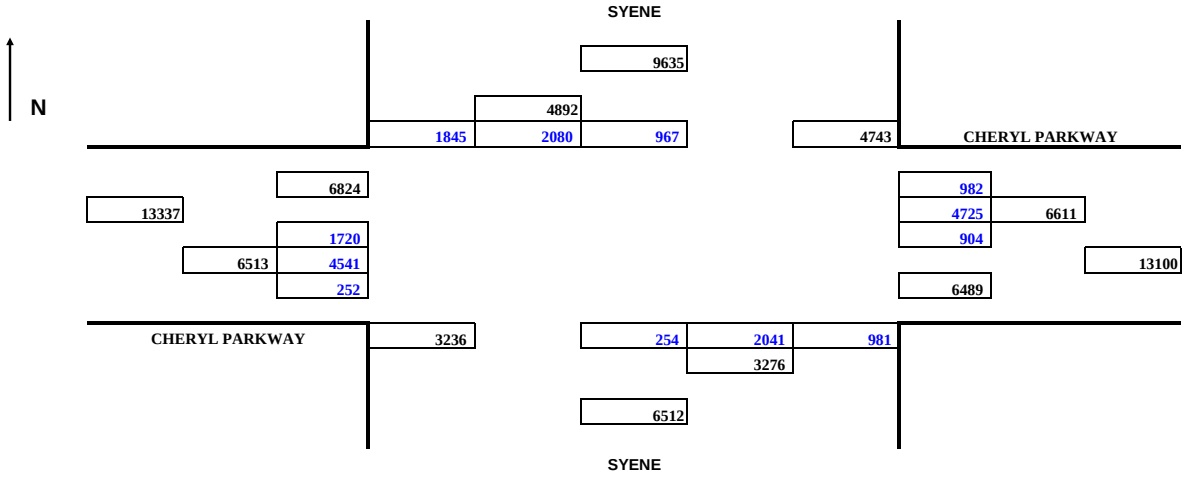
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 13: NOBEL - LACY



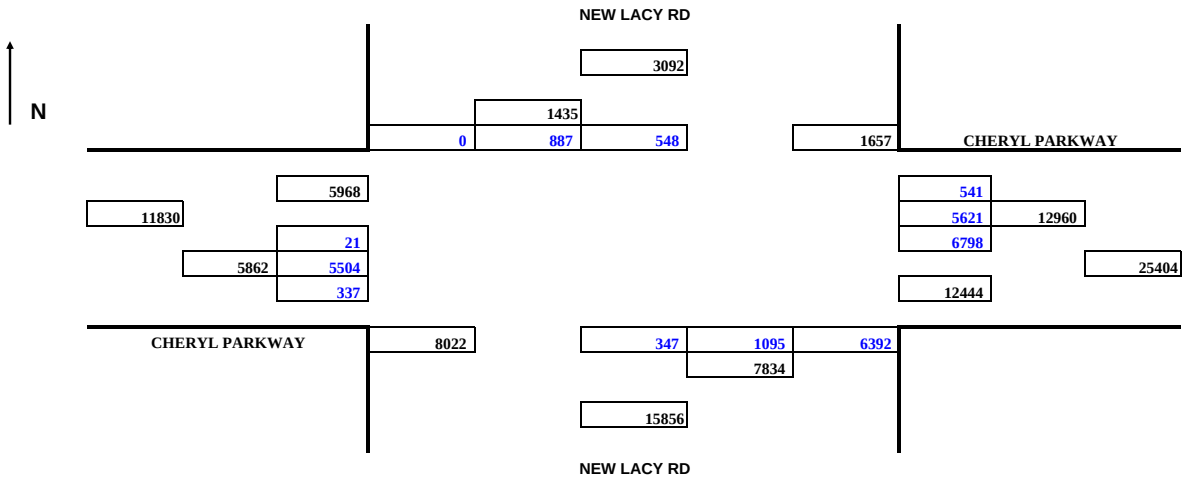
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 14: IRISH - SYENE



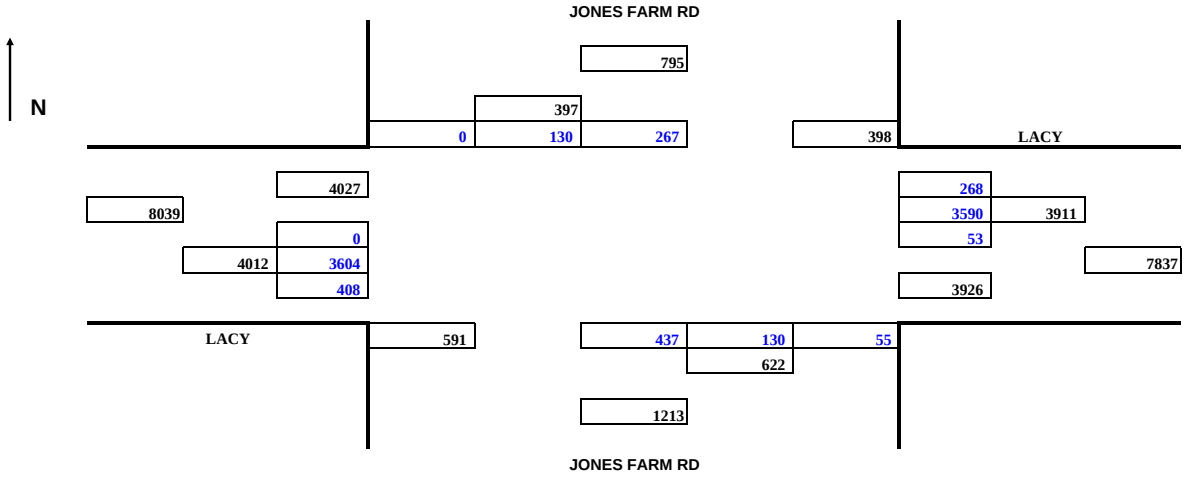
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 15: CHERYL PARKWAY - SYENE



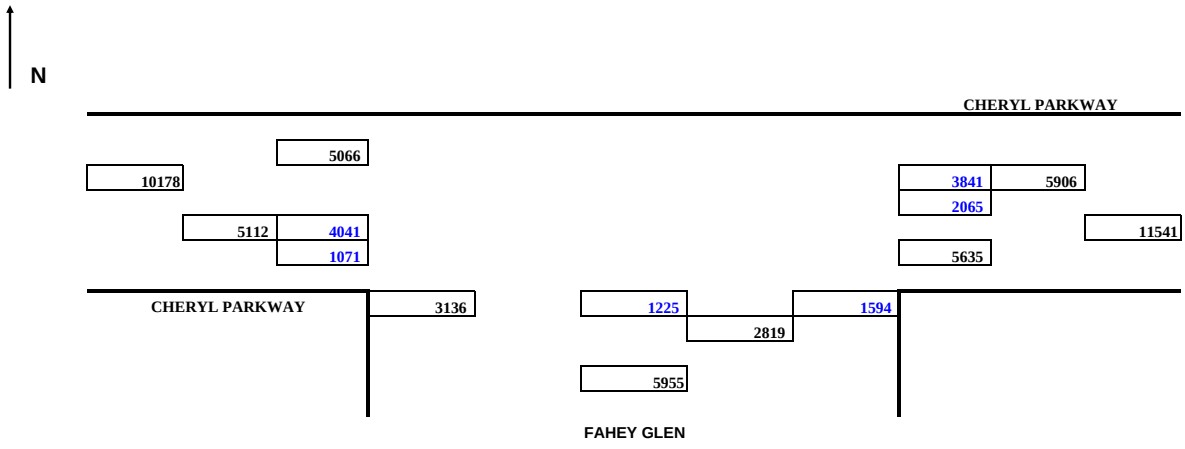
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



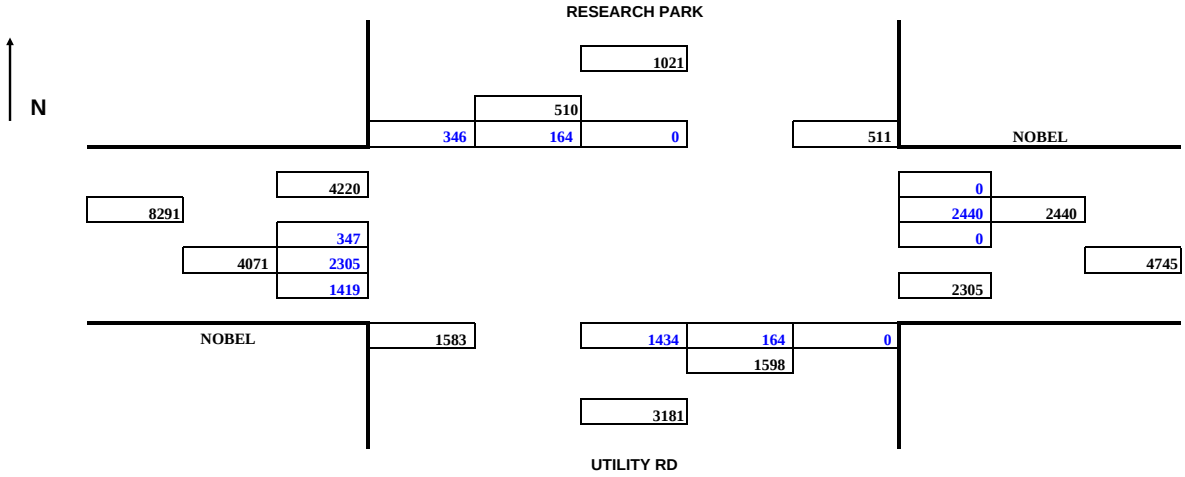
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 17: LACY - JONES FARM RD



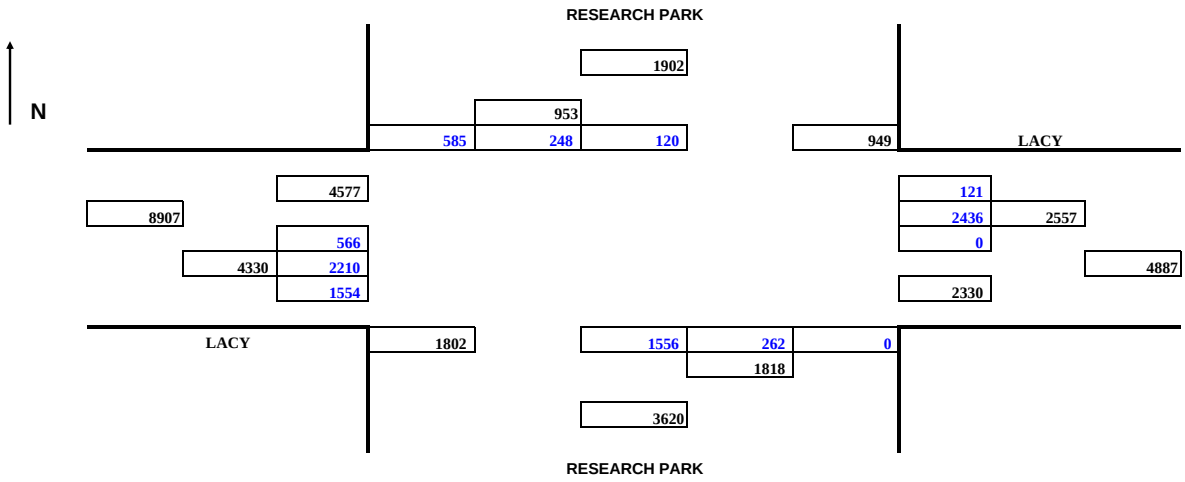
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



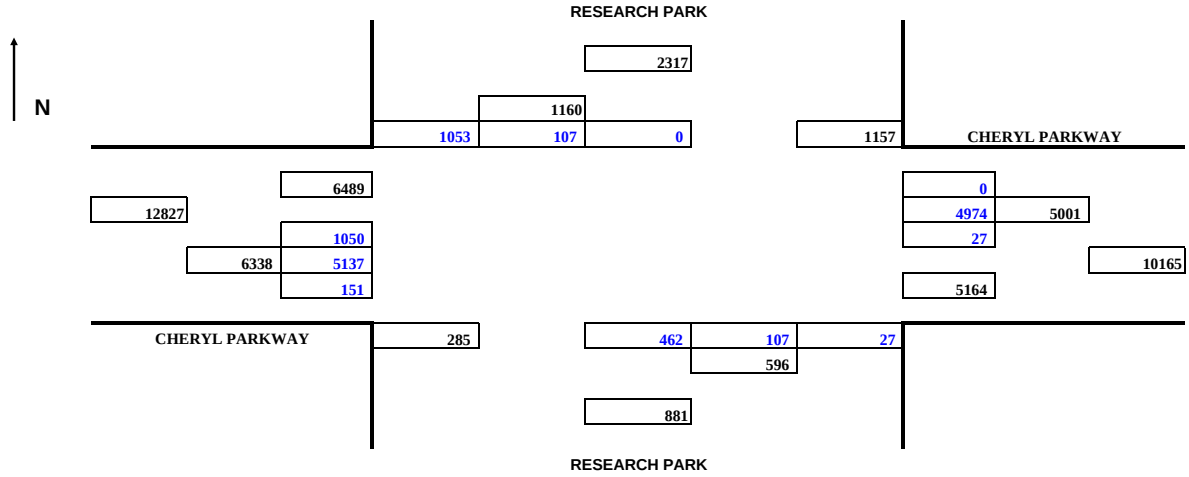
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 19: NOBEL - RESEARCH PARK



ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 20: LACY - RESEARCH PARK

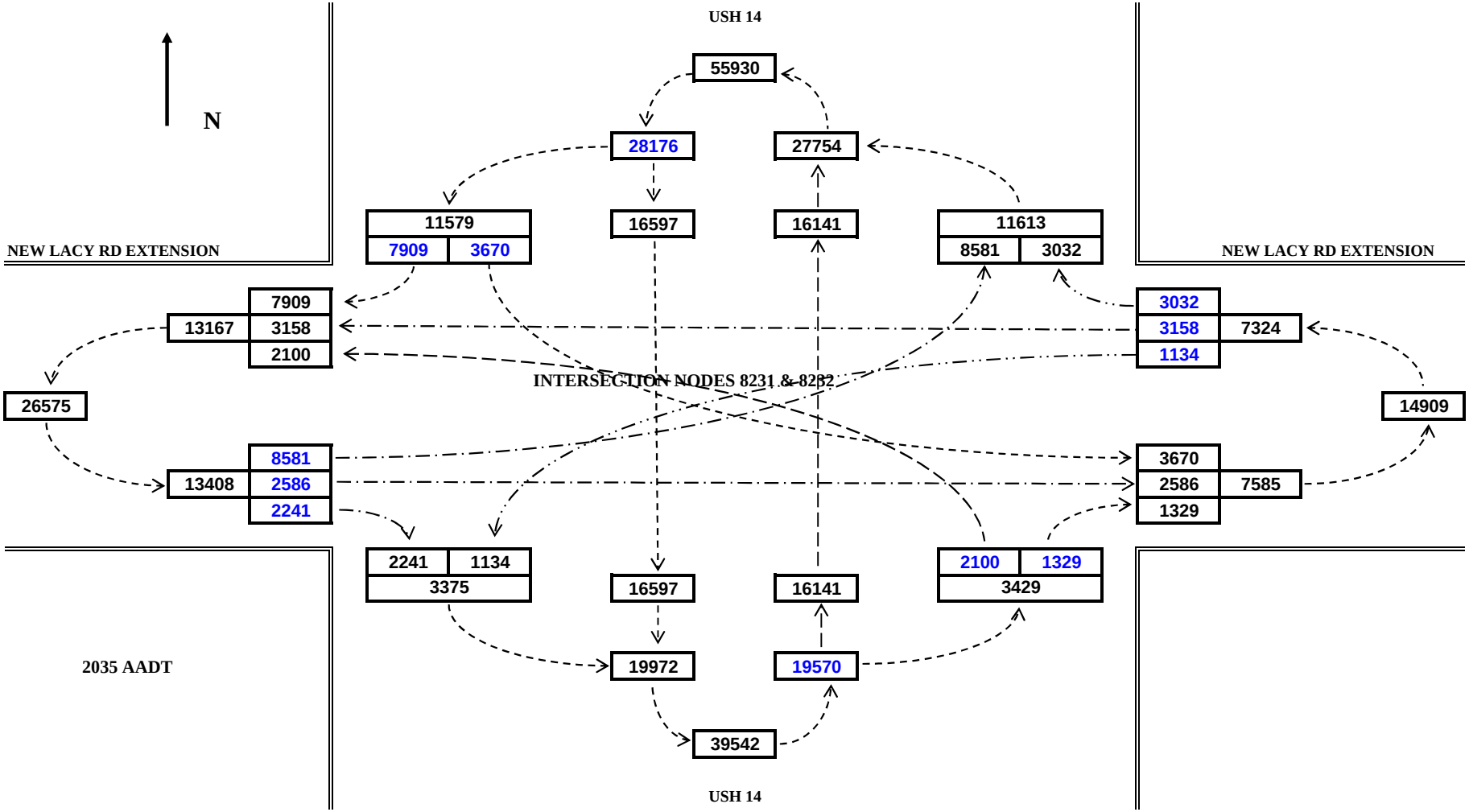


ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION

LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



APPENDIX A

City of Fitchburg Bicycle & Pedestrian Plan Maps

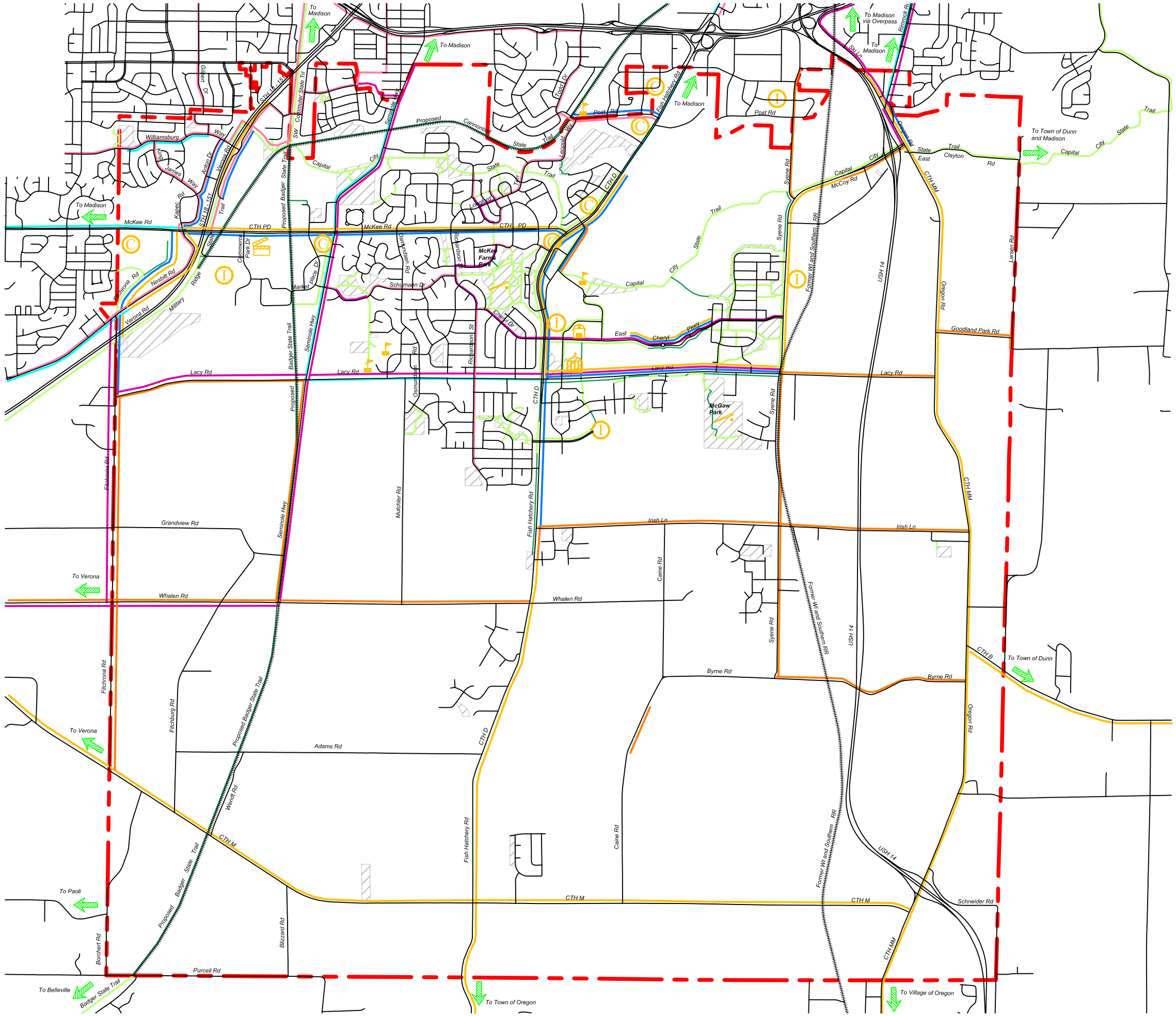
Draft Bicycle Recommendations

City of Fitchburg
Bike and Pedestrian Plan

May 14, 2008

LEGEND

- Existing Bike Route
- Proposed Bike Route
- Existing Bike Lane
- Proposed Bike Lane
- Existing Shared-Use Path
- Proposed Shared-Use Path
- Existing Paved Shoulders
- Proposed Paved Shoulders
- Commercial Area Destination
- Industrial Area Destination
- School Destination
- Community Parkland Destination
- Farmer's Market Destination
- City Hall/Community Center
- Cinema
- Parks


To Madison
To Madison via Overpass
To Madison
To Madison
To Madison
To Madison
To Town of Dunn and Madison
To Verona
To Verona
To Paoli
To Belleville
To Town of Oregon
To Village of Oregon
To Town of Dunn
Commerce Park Dr
Commuter Shuttle Trail
Proposed Badger State Trail
Seminole Hwy
Fish Hatchery Rd
Leopolis Way
Lacy Rd
Post Rd
McKee Rd
CTH PD
CTH D
CTH M
CTH MM
CTH B
Capital City State Trail
Capital City State Trail East
Trail
Syene Rd
Former WI and Southern RR
USH 14
Oregon Rd
Larsen Rd
Goodland Park Rd
Irish Ln
Byrne Rd
Whalen Rd
Adams Rd
Grandview Rd
Purcell Rd
Schneider Rd
Caine Rd
Blizzard Rd
Bonbiert Rd
Flitchrona Rd
Fitchburg Rd
Wendt Rd
Mutchler Rd
Osmundson Rd
Richardson St
Schumann Dr
Chapel Dr
Elden Dr
Willow Dr
Market
Ridge
Military
Verona Rd
Nesbitt Rd
Pleasant View Rd
Kanic Rd
Williamsburg Way
Jones Dr
Jeffrey Rd
Clayton Rd
McCoy Rd
Romnes Rd
McKee Farms Park
McGaw Park
Chend
East
Lacy Rd
Irish Ln
Byrne Rd
Whalen Rd
Badger State Trail
Proposed Badger State Trail
CTH B
CTH MM
USH 14
Former WI and Southern RR
Syene Rd
Larsen Rd
Oregon Rd
Goodland Park Rd
Schneider Rd
Caine Rd
Fish Hatchery

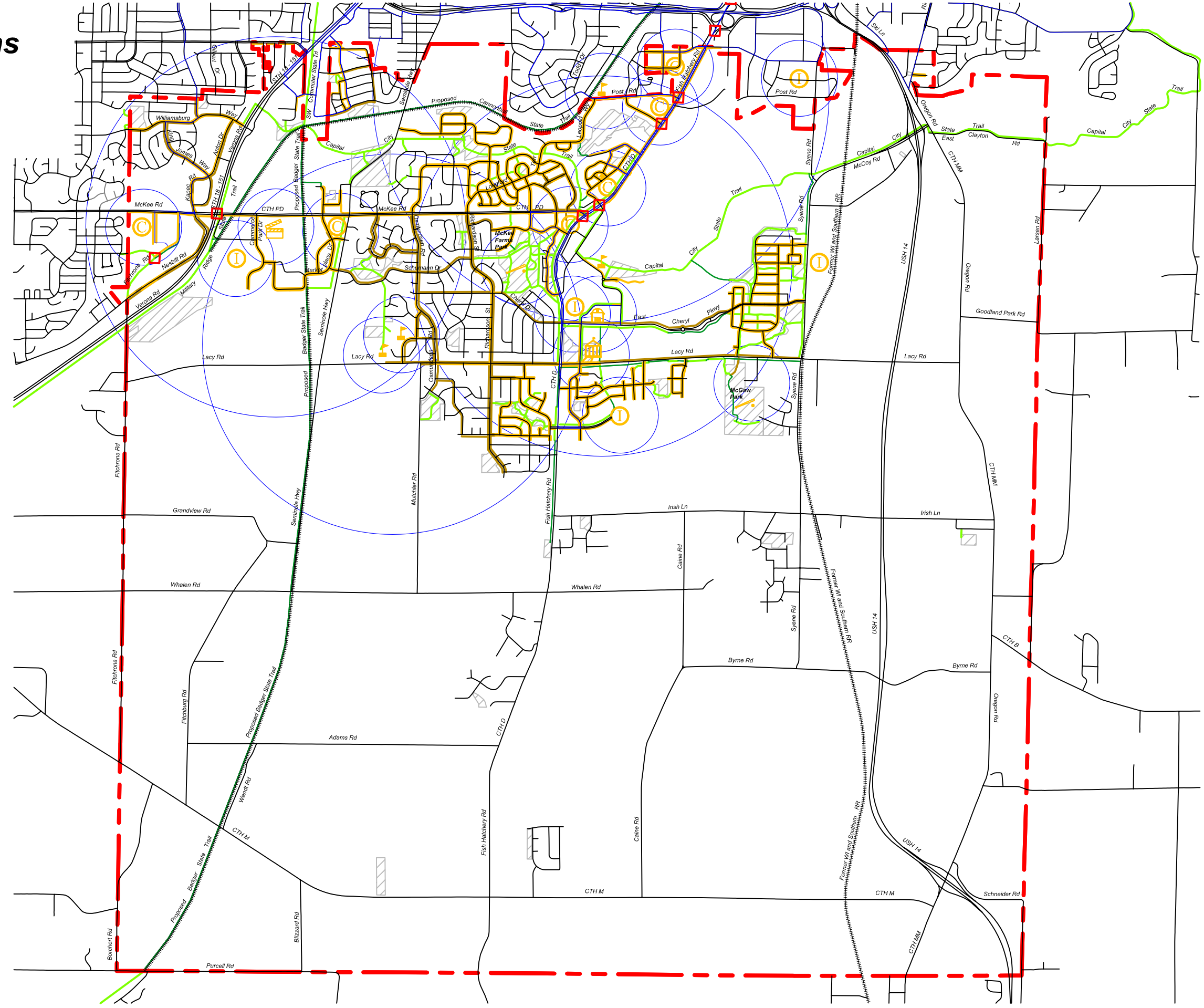
Draft Pedestrian Recommendations

City of Fitchburg
Bike and Pedestrian Plan

May 14, 2008

LEGEND

- Existing Sidewalks
- Proposed Sidewalks
- Existing Shared-Use Path
- Proposed Shared-Use Path
- Existing Bus Route
- Problematic Intersection
- Commercial Area Destination
- Industrial Area Destination
- School Destination
- Community Parkland Destination
- Farmer's Market Destination
- City Hall/Community Center
- Cinema
- Park
- .25 mile radius (5 minute walk)
- 1.25 mile radius



APPENDIX B

BACKGROUND TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS

APPENDIX B

Year 2008 Existing Traffic Peak Hour Analysis

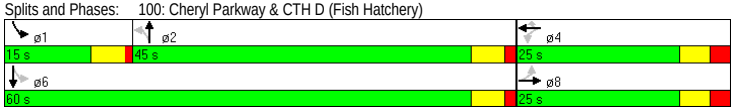
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	15	20	15	5	115	10	955	80	235	310	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.980				0.850		0.988			0.991	
Flt Protected		0.964			0.963		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1743	1538	1770	3490	0	1752	3468	0
Flt Permitted		0.766			0.786		0.510			0.099		
Satd. Flow (perm)	0	1388	0	0	1417	1510	947	3490	0	183	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	125	19	25	19	6	72	12	1194	100	294	388	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	25	72	12	1294	0	294	413	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.63			0.09	0.25	0.03	0.81		0.90	0.18	
Control Delay		40.7			27.4	29.6	12.4	23.0		50.1	5.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		40.7			27.4	29.6	12.4	23.0		50.1	5.7	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
70th %ile Green (s)	18.4	18.4		18.4	18.4	18.4	39.5	39.5		10.0	54.5	
70th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
50th %ile Green (s)	15.4	15.4		15.4	15.4	15.4	38.6	38.6		10.0	53.6	
50th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Gap	Gap		Max	Hold	
30th %ile Green (s)	12.4	12.4		12.4	12.4	12.4	32.5	32.5		10.0	47.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Gap	Gap		Max	Hold	
10th %ile Green (s)	10.0	10.0		10.0	10.0	10.0	27.0	27.0		10.0	42.0	
10th %ile Term Code	Min	Min		Hold	Hold	Hold	Gap	Gap		Max	Hold	
Queue Length 50th (ft)		79			10	31	3	270		91	35	
Queue Length 95th (ft)		125			27	59	11	315		#205	53	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		347			354	378	492	1814		328	2487	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.49			0.07	0.19	0.02	0.71		0.90	0.17	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 77	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 84.4	
50th %ile Actuated Cycle: 80.5	
30th %ile Actuated Cycle: 71.4	
10th %ile Actuated Cycle: 63.5	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Copy of Analysis\1. 2008 Exist\AM.syn Synchro 7 - Report
Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery)

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	15	20	15	5	115	10	955	80	235	310	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1736	1508	1764	3491		1752	3468	
Flt Permitted		0.77			0.79	1.00	0.51	1.00		0.10	1.00	
Satd. Flow (perm)		1387			1416	1508	947	3491		183	3468	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	125	19	25	19	6	72	12	1194	100	294	388	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	169	0	0	25	72	12	1294	0	294	413	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.8			14.8	14.8	35.4	35.4		50.5	50.5	
Effective Green, g (s)		14.8			14.8	14.8	35.4	35.4		50.5	50.5	
Actuated g/C Ratio		0.19			0.19	0.19	0.46	0.46		0.66	0.66	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		267			273	291	437	1609		327	2280	
v/s Ratio Prot								0.37		c0.12	0.12	
v/s Ratio Perm		c0.12			0.02	0.05	0.01			c0.47		
v/c Ratio		0.63			0.09	0.25	0.03	0.80		0.90	0.18	
Uniform Delay, d1		28.5			25.5	26.3	11.3	17.7		20.1	5.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1			0.2	0.5	0.0	3.2		25.3	0.1	
Delay (s)		33.6			25.6	26.8	11.3	20.9		45.3	5.2	
Level of Service		C			C	C	B	C		D	A	
Approach Delay (s)		33.6			26.5			20.8			21.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
110: Cheryl Parkway & Research Park Drive

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	180	10	10	80	10	5	15	20	5	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.986			0.931			0.930	
Flt Protected		0.989			0.995			0.994			0.988	
Satd. Flow (prot)	0	1831	0	0	1792	0	0	1724	0	0	1492	0
Flt Permitted		0.989			0.995			0.994			0.988	
Satd. Flow (perm)	0	1831	0	0	1792	0	0	1724	0	0	1492	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	82	269	15	15	119	15	7	22	30	7	7	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	366	0	0	149	0	0	59	0	0	29	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	180	10	10	80	10	5	15	20	5	5	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	82	269	15	15	119	15	7	22	30	7	7	15
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				1.00			1.00	1.00	1.00	1.00	1.00	
vC, conflicting volume	139			289			626	614	286	648	614	137
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			283			621	610	280	644	610	137
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.2	3.5
p0 queue free %	94			99			98	94	96	98	98	98
cM capacity (veh/h)	1438			1257			359	376	749	312	358	866

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	366	149	60	30
Volume Left	82	15	7	7
Volume Right	15	15	30	15
cSH	1438	1257	497	482
Volume to Capacity	0.06	0.01	0.12	0.06
Queue Length 95th (ft)	5	1	10	5
Control Delay (s)	2.1	0.9	13.2	13.0
Lane LOS	A	A	B	B
Approach Delay (s)	2.1	0.9	13.2	13.0
Approach LOS			B	B

Intersection Summary					
Average Delay	3.5				
Intersection Capacity Utilization	31.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	195	25	20	90	135	40	695	55	75	185	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	0.99		0.99		0.98	1.00	0.99	
Frt		0.983			0.910				0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	0	1719	1627	0	1770	3539	1583	1736	3342	0
Flt Permitted	0.372			0.600			0.581			0.141		
Satd. Flow (perm)	685	1810	0	1080	1627	0	1075	3539	1555	257	3342	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			408			1411	
Travel Time (s)		22.0			13.2			7.0			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	224	229	29	24	106	159	47	818	32	88	218	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	258	0	24	265	0	47	818	32	88	277	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

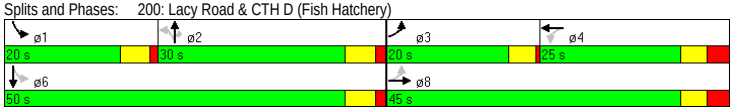
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.49	0.34		0.10	0.73		0.14	0.76	0.07	0.36	0.20	
Control Delay	18.6	18.0		28.8	44.2		24.5	32.1	23.2	18.2	14.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	18.6	18.0		28.8	44.2		24.5	32.1	23.2	18.2	14.8	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	9.6	39.1	
90th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	13.1	35.6		18.5	18.5		24.5	24.5	24.5	7.9	37.4	
70th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	11.2	33.7		18.5	18.5		24.5	24.5	24.5	6.9	36.4	
50th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	9.5	31.2		17.7	17.7		24.5	24.5	24.5	6.0	35.5	
30th %ile Term Code	Gap	Hold		Gap	Gap		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	6.2	22.8		12.6	12.6		18.0	18.0	18.0	0.0	18.0	
10th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Gap	Gap	Skip	Hold	
Queue Length 50th (ft)	71	89		10	127		18	201	12	25	43	
Queue Length 95th (ft)	117	141		31	#240		45	280	33	53	70	
Internal Link Dist (ft)		1051			599			328			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	537	930		267	402		352	1158	509	406	1986	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.42	0.28		0.09	0.66		0.13	0.71	0.06	0.22	0.14	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 77.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 89.6
70th %ile Actuated Cycle: 85
50th %ile Actuated Cycle: 82.1
30th %ile Actuated Cycle: 78.7
10th %ile Actuated Cycle: 52.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	195	25	20	90	135	40	695	55	75	185	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.91		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1751	1810		1711	1628		1760	3539	1557	1735	3342	
Flt Permitted	0.37	1.00		0.60	1.00		0.58	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	685	1810		1080	1628		1077	3539	1557	258	3342	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	224	229	29	24	106	159	47	818	32	88	218	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	224	258	0	24	265	0	47	818	32	88	277	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	32.4	32.4		17.4	17.4		23.5	23.5	23.5	34.1	34.1	
Effective Green, g (s)	32.4	32.4		17.4	17.4		23.5	23.5	23.5	34.1	34.1	
Actuated g/C Ratio	0.41	0.41		0.22	0.22		0.30	0.30	0.30	0.43	0.43	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	432	747		239	361		322	1059	466	217	1452	
v/s Ratio Prot	c0.07	0.14			c0.16			c0.23		c0.03	0.08	
v/s Ratio Perm	0.14			0.02			0.04		0.02	0.15		
v/c Ratio	0.52	0.35		0.10	0.73		0.15	0.77	0.07	0.41	0.19	
Uniform Delay, d1	16.0	15.8		24.3	28.4		20.1	25.1	19.7	15.3	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4		0.3	8.0		0.3	3.8	0.1	0.5	0.1	
Delay (s)	16.5	16.2		24.6	36.4		20.4	28.8	19.8	15.8	13.8	
Level of Service	B	B		C	D		C	C	B	B	B	
Approach Delay (s)		16.3			35.4			28.1			14.3	
Approach LOS		B			D			C			B	

Intersection Summary

HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	210	65	55	155	10	30	20	15	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.991			0.969			0.955	
Flt Protected		0.994		0.950				0.977			0.984	
Satd. Flow (prot)	0	1852	1583	1752	1828	0	0	1763	0	0	1653	0
Flt Permitted		0.994		0.950				0.977			0.984	
Satd. Flow (perm)	0	1852	1583	1752	1828	0	0	1763	0	0	1653	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	292	90	76	215	14	42	28	21	7	7	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	334	90	76	229	0	0	91	0	0	21	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	210	65	55	155	10	30	20	15	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	42	292	90	76	215	14	42	28	21	7	7	7
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	234			387			763	767	302	795	850	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			387			763	767	302	795	850	232
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	97			93			85	91	97	97	97	99
cM capacity (veh/h)	1328			1161			285	298	732	246	261	786

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	333	90	76	229	90	21
Volume Left	42	0	76	0	42	7
Volume Right	0	90	0	14	21	7
cSH	1328	1700	1161	1700	337	328
Volume to Capacity	0.03	0.05	0.07	0.13	0.27	0.06
Queue Length 95th (ft)	2	0	5	0	27	5
Control Delay (s)	1.2	0.0	8.3	0.0	19.5	16.7
Lane LOS	A		A		C	C
Approach Delay (s)	1.0		2.1		19.5	16.7
Approach LOS					C	C

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	160	5	1	245	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	0		0	0
Storage Lanes		1	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.925	
Flt Protected					0.978	
Satd. Flow (prot)	1863	1583	0	1810	1653	0
Flt Permitted					0.978	
Satd. Flow (perm)	1863	1583	0	1810	1653	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	5%	5%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	190	6	1	292	24	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	6	0	293	54	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	160	5	1	245	20	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	190	6	1	292	24	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			196		485	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			196		485	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	96
cM capacity (veh/h)			1359		537	846

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	190	6	293	54
Volume Left	0	0	1	24
Volume Right	0	6	0	30
cSH	1700	1700	1359	674
Volume to Capacity	0.11	0.00	0.00	0.08
Queue Length 95th (ft)	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	10.8
Lane LOS			A	B
Approach Delay (s)	0.0		0.0	10.8
Approach LOS				B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
230: Lacy Road & Fahey Glen 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	185	5	5	245	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.997				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1857	0	0	1808	1575	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1857	0	0	1808	1575	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1462			735	729	
Travel Time (s)	28.5			14.3	14.2	
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	226	6	6	299	6	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	232	0	0	305	18	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
230: Lacy Road & Fahey Glen 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	185	5	5	245	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	226	6	6	299	6	12
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			237		550	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			237		550	239
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			100		99	98
cM capacity (veh/h)			1307		480	779

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	232	305	18
Volume Left	0	6	6
Volume Right	6	0	12
cSH	1700	1307	645
Volume to Capacity	0.14	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.2	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.7
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		28.4%	ICU Level of Service A
Analysis Period (min)		15	

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	55	1	5	145	55	5	205	5	10	35	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		200
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.964			0.997			0.921	
Flt Protected		0.964			0.999			0.999			0.995	
Satd. Flow (prot)	0	1759	0	0	1726	0	0	1837	0	0	1627	0
Flt Permitted		0.964			0.999			0.999			0.995	
Satd. Flow (perm)	0	1759	0	0	1726	0	0	1837	0	0	1627	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	196	65	1	6	173	65	6	244	6	12	42	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	262	0	0	244	0	0	256	0	0	131	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	165	55	1	5	145	55	5	205	5	10	35	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	196	65	1	6	173	65	6	244	6	12	42	77
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	525	376	90	407	412	257	124			255		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	525	376	90	407	412	257	124			255		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	35	88	100	99	66	91	100			99		
cM capacity (veh/h)	303	540	954	484	513	766	1451			1276		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	263	244	256	131
Volume Left	196	6	6	12
Volume Right	1	65	6	77
cSH	342	562	1451	1276
Volume to Capacity	0.77	0.43	0.00	0.01
Queue Length 95th (ft)	154	55	0	1
Control Delay (s)	43.3	16.2	0.2	0.8
Lane LOS	E	C	A	A
Approach Delay (s)	43.3	16.2	0.2	0.8
Approach LOS	E	C		

Intersection Summary				
Average Delay	17.4			
Intersection Capacity Utilization	46.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	10	5	5	10	5	700	30	50	145	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.958			0.976		0.950			0.950		
Satd. Flow (prot)	0	1785	1583	0	1325	1154	1752	1845	1568	1656	1743	1482
Flt Permitted		0.958			0.976		0.950			0.950		
Satd. Flow (perm)	0	1785	1583	0	1325	1154	1752	1845	1568	1656	1743	1482
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	40%	40%	40%	3%	3%	3%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	40	6	11	6	6	11	6	805	34	57	167	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	11	0	12	11	6	805	34	57	167	17
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	5	10	5	5	10	5	700	30	50	145	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	40	6	11	6	6	11	6	805	34	57	167	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1122	1142	177	1122	1125	815	189			844		
vC1, stage 1 conf vol	287	287		821	821							
vC2, stage 2 conf vol	835	856		301	304							
vCu, unblocked vol	1122	1142	177	1122	1125	815	189			844		
tC, single (s)	7.1	6.5	6.2	7.5	6.9	6.6	4.1			4.2		
tC, 2 stage (s)	6.1	5.5		6.5	5.9							
tF (s)	3.5	4.0	3.3	3.9	4.4	3.7	2.2			2.3		
p0 queue free %	85	98	99	98	98	96	100			92		
cM capacity (veh/h)	271	298	859	290	307	322	1373			760		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	46	11	11	11	6	805	34	57	167	17
Volume Left	40	0	6	0	6	0	0	57	0	0
Volume Right	0	11	0	11	0	0	34	0	0	17
cSH	274	859	298	322	1373	1700	1700	760	1700	1700
Volume to Capacity	0.17	0.01	0.04	0.04	0.00	0.47	0.02	0.08	0.10	0.01
Queue Length 95th (ft)	15	1	3	3	0	0	0	6	0	0
Control Delay (s)	20.8	9.2	17.6	16.6	7.6	0.0	0.0	10.1	0.0	0.0
Lane LOS	C	A	C	C	A			B		
Approach Delay (s)	18.5		17.1		0.1			2.4		
Approach LOS	C		C							

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	30	15	5	5	1	5	1	10	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.950			0.970			0.919			0.955	
Flt Protected	0.950			0.950				0.984			0.984	
Satd. Flow (prot)	1752	1752	0	1770	1807	0	0	1606	0	0	1249	0
Flt Permitted	0.950			0.950				0.984			0.984	
Satd. Flow (perm)	1752	1752	0	1770	1807	0	0	1606	0	0	1249	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	7%	7%	7%	43%	43%	43%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	46	23	8	8	2	8	2	15	8	8	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	69	0	8	10	0	0	25	0	0	24	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	30	15	5	5	1	5	1	10	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Hourly flow rate (vph)	31	46	23	8	8	2	8	2	15	8	8	8
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			74			164	154	68	158	165	18
vC1, stage 1 conf vol							124	124		29	29	
vC2, stage 2 conf vol							40	30		129	136	
vCu, unblocked vol	14			74			164	154	68	158	165	18
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.5	6.9	6.6
tC, 2 stage (s)							6.2	5.6		6.5	5.9	
tF (s)	2.2			2.2			3.6	4.1	3.4	3.9	4.4	3.7
p0 queue free %	98			99			99	100	98	99	99	99
cM capacity (veh/h)	1591			1519			809	738	974	724	668	945

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	31	69	8	9	25	23
Volume Left	31	0	8	0	8	8
Volume Right	0	23	0	2	15	8
cSH	1591	1700	1519	1700	899	762
Volume to Capacity	0.02	0.04	0.01	0.01	0.03	0.03
Queue Length 95th (ft)	1	0	0	0	2	2
Control Delay (s)	7.3	0.0	7.4	0.0	9.1	9.9
Lane LOS	A		A		A	A
Approach Delay (s)	2.2		3.4		9.1	9.9
Approach LOS					A	A

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	20.2%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	90	560	40	25	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1703	1792
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1863	1583	1703	1792
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	18	107	667	48	30	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	107	667	48	30	143
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	90	560	40	25	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	107	667	48	30	143
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	879	677			719	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	677			719	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	94	76			97	
cM capacity (veh/h)	304	449			860	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	18	107	667	48	30	143
Volume Left	18	0	0	0	30	0
Volume Right	0	107	0	48	0	0
cSH	304	449	1700	1700	860	1700
Volume to Capacity	0.06	0.24	0.39	0.03	0.03	0.08
Queue Length 95th (ft)	5	23	0	0	3	0
Control Delay (s)	17.6	15.5	0.0	0.0	9.3	0.0
Lane LOS	C	C			A	
Approach Delay (s)	15.8		0.0		1.6	
Approach LOS	C					

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		43.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	100	1	1	80	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.912	
Flt Protected					0.983	
Satd. Flow (prot)	1861	0	0	1845	1670	0
Flt Permitted					0.983	
Satd. Flow (perm)	1861	0	0	1845	1670	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	133	1	1	107	7	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	0	0	108	20	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	100	1	1	80	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	133	1	1	107	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			135		243	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		243	134
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1444		744	915

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	108	20
Volume Left	0	1	7
Volume Right	1	0	13
cSH	1700	1444	850
Volume to Capacity	0.08	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.3
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		15.3%	ICU Level of Service A
Analysis Period (min)		15	

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Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	35	5	5	45	15	10	100	1	10	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.969			0.999			0.946	
Flt Protected		0.968			0.996			0.996			0.990	
Satd. Flow (prot)	0	1777	0	0	1746	0	0	1818	0	0	1561	0
Flt Permitted		0.968			0.996			0.996			0.990	
Satd. Flow (perm)	0	1777	0	0	1746	0	0	1818	0	0	1561	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	4%	4%	4%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	45	6	6	58	19	13	130	1	13	26	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	83	0	0	144	0	0	65	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	35	5	5	45	15	10	100	1	10	20	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	97	45	6	6	58	19	13	130	1	13	26	26
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	280	232	49	261	244	141	57			136		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280	232	49	261	244	141	57			136		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	84	93	99	99	91	98	99			99		
cM capacity (veh/h)	592	649	1008	627	635	892	1528			1371		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	149	84	144	65
Volume Left	97	6	13	13
Volume Right	6	19	1	26
cSH	620	680	1528	1371
Volume to Capacity	0.24	0.12	0.01	0.01
Queue Length 95th (ft)	23	11	1	1
Control Delay (s)	12.6	11.0	0.7	1.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.6	11.0	0.7	1.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			

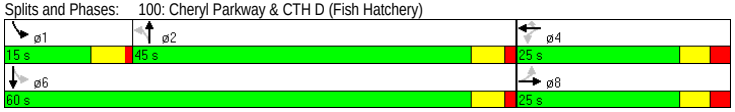
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	15	35	20	280	5	465	5	150	865	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.964				0.850		0.998			0.988	
Flt Protected		0.969			0.969		0.950			0.950		
Satd. Flow (prot)	0	1698	0	0	1805	1583	1736	3463	0	1770	3490	0
Flt Permitted		0.770			0.770		0.265			0.342		
Satd. Flow (perm)	0	1344	0	0	1429	1554	484	3463	0	636	3490	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	40	6	17	40	23	161	6	534	6	172	994	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	63	161	6	540	0	172	1080	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.19			0.18	0.42	0.03	0.43		0.30	0.48	
Control Delay		19.6			19.4	22.8	14.4	15.5		7.3	7.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		19.6			19.4	22.8	14.4	15.5		7.3	7.8	
90th %ile Green (s)	16.6	16.6		16.6	16.6	16.6	22.4	22.4		10.0	37.4	
90th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Gap	Gap		Max	Hold	
70th %ile Green (s)	13.0	13.0		13.0	13.0	13.0	18.0	18.0		8.3	31.3	
70th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Gap	Gap		Gap	Hold	
50th %ile Green (s)	10.9	10.9		10.9	10.9	10.9	16.0	16.0		7.1	28.1	
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Min	Min		Gap	Hold	
30th %ile Green (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		6.2	27.2	
30th %ile Term Code	Hold	Hold		Min	Min	Min	Min	Min		Gap	Hold	
10th %ile Green (s)	0.0	0.0		0.0	0.0	0.0	16.0	16.0		5.2	26.2	
10th %ile Term Code	Skip	Skip		Skip	Skip	Skip	Min	Min		Gap	Hold	
Queue Length 50th (ft)		15			15	42	1	66		21	94	
Queue Length 95th (ft)		46			46	100	9	122		52	165	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		537			571	620	378	2704		636	3357	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.12			0.11	0.26	0.02	0.20		0.27	0.32	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 50.4	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 65.5	
70th %ile Actuated Cycle: 55.8	
50th %ile Actuated Cycle: 50.5	
30th %ile Actuated Cycle: 48.7	
10th %ile Actuated Cycle: 31.7	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery)

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	15	35	20	280	5	465	5	150	865	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1689			1797	1551	1733	3464		1769	3490	
Flt Permitted		0.77			0.77	1.00	0.26	1.00		0.34	1.00	
Satd. Flow (perm)		1341			1427	1551	483	3464		636	3490	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	40	6	17	40	23	161	6	534	6	172	994	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	63	0	0	63	161	6	540	0	172	1080	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		9.2			9.2	9.2	18.6	18.6		31.0	31.0	
Effective Green, g (s)		9.2			9.2	9.2	18.6	18.6		31.0	31.0	
Actuated g/C Ratio		0.18			0.18	0.18	0.36	0.36		0.60	0.60	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		239			254	276	174	1246		544	2093	
v/s Ratio Prot								0.16		0.05	c0.31	
v/s Ratio Perm		0.05			0.04	c0.10	0.01			0.14		
v/c Ratio		0.26			0.25	0.58	0.03	0.43		0.32	0.52	
Uniform Delay, d1		18.3			18.3	19.5	10.7	12.6		5.0	6.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.6	3.3	0.1	0.3		0.1	0.3	
Delay (s)		19.0			18.9	22.8	10.8	12.9		5.1	6.3	
Level of Service		B			B	C	B	B		A	A	
Approach Delay (s)		19.0			21.7			12.9			6.1	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	11.5
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
110: Cheryl Parkway & Research Park Drive

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	110	5	45	220	5	20	5	20	20	35	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.998			0.940			0.927	
Flt Protected		0.987			0.992			0.978			0.992	
Satd. Flow (prot)	0	1831	0	0	1844	0	0	1617	0	0	1696	0
Flt Permitted		0.987			0.992			0.978			0.992	
Satd. Flow (perm)	0	1831	0	0	1844	0	0	1617	0	0	1696	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	8%	8%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	51	139	6	57	278	6	25	6	25	25	44	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	196	0	0	341	0	0	56	0	0	151	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	110	5	45	220	5	20	5	20	20	35	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	51	139	6	57	278	6	25	6	25	25	44	82
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked												
vC, conflicting volume	290			151			754	652	152	678	652	292
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			151			754	652	152	678	652	292
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	96			96			89	98	97	92	87	89
cM capacity (veh/h)	1267			1425			237	347	871	324	353	739

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	196	342	57	152
Volume Left	51	57	25	25
Volume Right	6	6	25	82
cSH	1267	1425	370	482
Volume to Capacity	0.04	0.04	0.15	0.32
Queue Length 95th (ft)	3	3	13	33
Control Delay (s)	2.3	1.6	16.5	15.9
Lane LOS	A	A	C	C
Approach Delay (s)	2.3	1.6	16.5	15.9
Approach LOS			C	C

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
200: Lacy Road & CTH D (Fish Hatchery)

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	115	40	80	225	95	60	285	30	190	600	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	0.99		1.00		0.98	1.00	0.99	
Frt		0.961			0.956				0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1783	0	1736	1736	0	1752	3505	1568	1770	3416	0
Flt Permitted	0.261			0.643			0.325			0.424		
Satd. Flow (perm)	485	1783	0	1168	1736	0	598	3505	1540	788	3416	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			408			1411	
Travel Time (s)		22.0			13.2			7.0			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	76	134	47	93	262	110	70	331	17	221	698	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	181	0	93	372	0	70	331	17	221	872	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

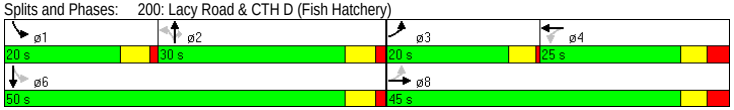
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.24	0.27		0.31	0.83		0.46	0.38	0.04	0.44	0.55	
Control Delay	16.8	18.3		29.1	46.8		36.9	25.1	23.1	15.3	16.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	16.8	18.3		29.1	46.8		36.9	25.1	23.1	15.3	16.2	
90th %ile Green (s)	9.2	31.7		18.5	18.5		24.5	24.5	24.5	14.7	44.2	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	7.3	29.8		18.5	18.5		19.6	19.6	19.6	11.9	36.5	
70th %ile Term Code	Gap	Hold		Max	Max		Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	6.3	28.8		18.5	18.5		16.0	16.0	16.0	10.2	31.2	
50th %ile Term Code	Gap	Hold		Max	Max		Min	Min	Min	Gap	Hold	
30th %ile Green (s)	5.5	28.0		18.5	18.5		16.0	16.0	16.0	8.7	29.7	
30th %ile Term Code	Gap	Hold		Max	Max		Min	Min	Min	Gap	Hold	
10th %ile Green (s)	0.0	18.5		18.5	18.5		16.0	16.0	16.0	6.3	27.3	
10th %ile Term Code	Skip	Hold		Max	Max		Min	Min	Min	Gap	Hold	
Queue Length 50th (ft)	19	52		33	156		28	66	6	60	148	
Queue Length 95th (ft)	52	115		86	#364		70	108	22	103	200	
Internal Link Dist (ft)		1051			599			328			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	484	957		301	448		204	1197	526	573	2118	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.16	0.19		0.31	0.83		0.34	0.28	0.03	0.39	0.41	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 73.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 87.9
70th %ile Actuated Cycle: 78.3
50th %ile Actuated Cycle: 72
30th %ile Actuated Cycle: 69.7
10th %ile Actuated Cycle: 57.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	115	40	80	225	95	60	285	30	190	600	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1769	1778		1722	1737		1747	3505	1540	1768	3416	
Flt Permitted	0.26	1.00		0.64	1.00		0.33	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	486	1778		1166	1737		598	3505	1540	790	3416	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	76	134	47	93	262	110	70	331	17	221	698	174
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	76	181	0	93	372	0	70	331	17	221	872	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	28.2	28.2		18.9	18.9		18.5	18.5	18.5	33.7	33.7	
Effective Green, g (s)	28.2	28.2		18.9	18.9		18.5	18.5	18.5	33.7	33.7	
Actuated g/C Ratio	0.38	0.38		0.26	0.26		0.25	0.25	0.25	0.46	0.46	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	277	678		298	444		150	877	386	495	1558	
v/s Ratio Prot	0.02	c0.10			c0.21			0.09		0.06	c0.26	
v/s Ratio Perm	0.08			0.08			0.12		0.01	0.14		
v/c Ratio	0.27	0.27		0.31	0.84		0.47	0.38	0.04	0.45	0.56	
Uniform Delay, d1	15.8	15.7		22.2	26.0		23.5	22.9	21.0	12.8	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.8	13.5		3.1	0.4	0.1	0.2	0.5	
Delay (s)	16.0	16.0		23.1	39.5		26.6	23.3	21.1	13.0	15.2	
Level of Service	B	B		C	D		C	C	C	B	B	
Approach Delay (s)		16.0			36.2			23.8			14.8	
Approach LOS		B			D			C			B	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	18.5	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	250	50	15	210	5	50	10	35	10	10	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.997			0.950			0.894	
Flt Protected		0.998		0.950				0.974			0.995	
Satd. Flow (prot)	0	1859	1583	1752	1839	0	0	1707	0	0	1657	0
Flt Permitted		0.998		0.950				0.974			0.995	
Satd. Flow (perm)	0	1859	1583	1752	1839	0	0	1707	0	0	1657	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	362	72	22	304	7	72	14	51	14	14	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	376	72	22	311	0	0	137	0	0	129	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	250	50	15	210	5	50	10	35	10	10	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	14	362	72	22	304	7	72	14	51	14	14	101
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	317			440			858	756	372	811	825	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			440			858	756	372	811	825	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			67	96	92	94	95	86
cM capacity (veh/h)	1238			1110			219	323	666	256	296	717

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	377	72	22	312	138	130
Volume Left	14	0	22	0	72	14
Volume Right	0	72	0	7	51	101
cSH	1238	1700	1110	1700	305	528
Volume to Capacity	0.01	0.04	0.02	0.18	0.45	0.25
Queue Length 95th (ft)	1	0	1	0	56	24
Control Delay (s)	0.4	0.0	8.3	0.0	26.2	14.0
Lane LOS	A		A		D	B
Approach Delay (s)	0.4		0.5		26.2	14.0
Approach LOS					D	B

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	40.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	255	20	15	230	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	0		0	0
Storage Lanes		1	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	1845	1568	0	1857	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	1845	1568	0	1857	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	319	25	19	288	13	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	319	25	0	307	24	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	255	20	15	230	10	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	319	25	19	288	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			344		644	319
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			344		644	319
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	98
cM capacity (veh/h)			1215		431	722

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	319	25	306	25
Volume Left	0	0	19	12
Volume Right	0	25	0	12
cSH	1700	1700	1215	539
Volume to Capacity	0.19	0.01	0.02	0.05
Queue Length 95th (ft)	0	0	1	4
Control Delay (s)	0.0	0.0	0.6	12.0
Lane LOS			A	B
Approach Delay (s)	0.0		0.6	12.0
Approach LOS				B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		34.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
230: Lacy Road & Fahey Glen 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	260	5	5	230	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.998				0.932	
Flt Protected				0.999	0.976	
Satd. Flow (prot)	1841	0	0	1843	1694	0
Flt Permitted				0.999	0.976	
Satd. Flow (perm)	1841	0	0	1843	1694	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1462			735	729	
Travel Time (s)	28.5			14.3	14.2	
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	338	6	6	299	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	0	0	305	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
230: Lacy Road & Fahey Glen 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	260	5	5	230	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	338	6	6	299	6	6
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			349		663	351
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			349		663	351
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1199		421	687

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	344	305	13
Volume Left	0	6	6
Volume Right	6	0	6
cSH	1700	1199	522
Volume to Capacity	0.20	0.01	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.2	12.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.1
Approach LOS			B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		27.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	140	20	5	65	25	5	40	1	60	220	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		200
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.965			0.998			0.944	
Flt Protected		0.986			0.998			0.995			0.994	
Satd. Flow (prot)	0	1780	0	0	1777	0	0	1780	0	0	1731	0
Flt Permitted		0.986			0.998			0.995			0.994	
Satd. Flow (perm)	0	1780	0	0	1777	0	0	1780	0	0	1731	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	6%	6%	6%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	84	182	26	6	84	32	6	52	1	78	286	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	292	0	0	122	0	0	59	0	0	624	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	140	20	5	65	25	5	40	1	60	220	200
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	84	182	26	6	84	32	6	52	1	78	286	260
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	722	648	426	764	777	63	550			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	722	648	426	764	777	63	550			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	65	50	96	96	72	97	99			95		
cM capacity (veh/h)	244	362	619	175	306	991	995			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	292	123	60	623
Volume Left	84	6	6	78
Volume Right	26	32	1	260
cSH	328	357	995	1533
Volume to Capacity	0.89	0.35	0.01	0.05
Queue Length 95th (ft)	211	38	0	4
Control Delay (s)	62.0	20.3	1.0	1.4
Lane LOS	F	C	A	A
Approach Delay (s)	62.0	20.3	1.0	1.4
Approach LOS	F	C		

Intersection Summary				
Average Delay		19.6		
Intersection Capacity Utilization		59.6%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1	5	25	5	50	5	250	10	10	690	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.955			0.960		0.950			0.950		
Satd. Flow (prot)	0	1779	1583	0	1771	1568	1736	1827	1553	1752	1845	1568
Flt Permitted		0.955			0.960		0.950			0.950		
Satd. Flow (perm)	0	1779	1583	0	1771	1568	1736	1827	1553	1752	1845	1568
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	1	6	29	6	58	6	291	12	12	802	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	6	0	35	58	6	291	12	12	802	41
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	1	5	25	5	50	5	250	10	10	690	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	1	6	29	6	58	6	291	12	12	802	41
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1199	1150	812	1144	1179	301	848			307		
vC1, stage 1 conf vol	831	831		307	307							
vC2, stage 2 conf vol	368	319		837	871							
vCu, unblocked vol	1199	1150	812	1144	1179	301	848			307		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	98	91	98	92	99			99		
cM capacity (veh/h)	321	350	376	321	333	730	778			1242		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	19	6	35	58	6	291	12	12	802	41
Volume Left	17	0	29	0	6	0	0	12	0	0
Volume Right	0	6	0	58	0	0	12	0	0	41
cSH	322	376	323	730	778	1700	1700	1242	1700	1700
Volume to Capacity	0.06	0.02	0.11	0.08	0.01	0.17	0.01	0.01	0.47	0.02
Queue Length 95th (ft)	5	1	9	6	1	0	0	1	0	0
Control Delay (s)	16.9	14.7	17.5	10.4	9.7	0.0	0.0	7.9	0.0	0.0
Lane LOS	C	B	C	B	A			A		
Approach Delay (s)	16.3		13.0		0.2			0.1		
Approach LOS	C		B							

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	5	1	1	60	5	5	1	1	5	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.989			0.985			0.894	
Flt Protected	0.950			0.950				0.963			0.991	
Satd. Flow (prot)	1570	1621	0	1719	1790	0	0	1442	0	0	1530	0
Flt Permitted	0.950			0.950				0.963			0.991	
Satd. Flow (perm)	1570	1621	0	1719	1790	0	0	1442	0	0	1530	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	15%	15%	15%	5%	5%	5%	25%	25%	25%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	7	1	1	86	7	7	1	1	7	1	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	8	0	1	93	0	0	9	0	0	37	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	5	1	1	60	5	5	1	1	5	1	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	14	7	1	1	86	7	7	1	1	7	1	29
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98			14			164	142	18	140	139	99
vC1, stage 1 conf vol							41	41		97	97	
vC2, stage 2 conf vol							123	101		43	42	
vCu, unblocked vol	98			14			164	142	18	140	139	99
tC, single (s)	4.2			4.1			7.3	6.8	6.5	7.2	6.6	6.3
tC, 2 stage (s)							6.3	5.8		6.2	5.6	
tF (s)	2.3			2.2			3.7	4.2	3.5	3.6	4.1	3.4
p0 queue free %	99			100			99	100	100	99	100	97
cM capacity (veh/h)	1412			1579			758	725	989	845	761	927

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	14	9	1	93	10	37
Volume Left	14	0	1	0	7	7
Volume Right	0	1	0	7	1	29
cSH	1412	1700	1579	1700	779	903
Volume to Capacity	0.01	0.01	0.00	0.05	0.01	0.04
Queue Length 95th (ft)	1	0	0	0	1	3
Control Delay (s)	7.6	0.0	7.3	0.0	9.7	9.2
Lane LOS	A		A		A	A
Approach Delay (s)	4.7		0.1		9.7	9.2
Approach LOS					A	A

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	19.7%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	35	195	15	90	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1736	1553	1863	1583	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1736	1553	1863	1583	1770	1863
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	40	40	224	17	103	684
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	40	224	17	103	684
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	35	195	15	90	595
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	40	40	224	17	103	684
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1125	234			246	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1125	234			246	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	95			92	
cM capacity (veh/h)	205	793			1314	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	40	224	17	103	684
Volume Left	40	0	0	0	103	0
Volume Right	0	40	0	17	0	0
cSH	205	793	1700	1700	1314	1700
Volume to Capacity	0.20	0.05	0.13	0.01	0.08	0.40
Queue Length 95th (ft)	18	4	0	0	6	0
Control Delay (s)	26.7	9.8	0.0	0.0	8.0	0.0
Lane LOS	D	A			A	
Approach Delay (s)	18.3		0.0		1.0	
Approach LOS	C					

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		42.9%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	90	5	15	120	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.993				0.884	
Flt Protected				0.994	0.993	
Satd. Flow (prot)	1814	0	0	1852	1635	0
Flt Permitted				0.994	0.993	
Satd. Flow (perm)	1814	0	0	1852	1635	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	102	6	17	136	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	153	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	90	5	15	120	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	102	6	17	136	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			108		276	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			108		276	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1483		706	949

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	108	153	7
Volume Left	0	17	1
Volume Right	6	0	6
cSH	1700	1483	898
Volume to Capacity	0.06	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.9	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.0
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		23.8%	ICU Level of Service A
Analysis Period (min)		15	

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	40	15	5	35	5	5	25	1	20	105	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.969			0.986			0.997			0.945	
Flt Protected		0.992			0.995			0.992			0.995	
Satd. Flow (prot)	0	1739	0	0	1827	0	0	1842	0	0	1751	0
Flt Permitted		0.992			0.995			0.992			0.995	
Satd. Flow (perm)	0	1739	0	0	1827	0	0	1842	0	0	1751	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	51	19	6	44	6	6	32	1	25	133	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	56	0	0	39	0	0	266	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	40	15	5	35	5	5	25	1	20	105	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	51	19	6	44	6	6	32	1	25	133	108
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	321	293	197	337	346	42	246			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321	293	197	337	346	42	246			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	91	98	99	92	99	100			98		
cM capacity (veh/h)	567	595	830	547	560	1020	1315			1566		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	82	57	39	266
Volume Left	13	6	6	25
Volume Right	19	6	1	108
cSH	632	588	1315	1566
Volume to Capacity	0.13	0.10	0.00	0.02
Queue Length 95th (ft)	11	8	0	1
Control Delay (s)	11.6	11.8	1.3	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	11.8	1.3	0.8
Approach LOS	B	B		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	27.5%	ICU Level of Service	A	
Analysis Period (min)	15			

APPENDIX B

Year 2025 Background Traffic Peak Hour Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	300	15	1250	270	600	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.981				0.850		0.973			0.992	
Flt Protected		0.964			0.955		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1728	1538	1719	3330	0	1719	3406	0
Flt Permitted		0.714			0.665		0.444			0.090		
Satd. Flow (perm)	0	1259	0	0	1198	1510	801	3330	0	163	3406	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	22	28	100	6	167	17	1389	300	667	528	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	106	167	17	1689	0	667	556	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.77			0.44	0.55	0.04	1.06		2.25	0.25	
Control Delay		52.2			35.0	37.0	12.9	64.2		588.7	6.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		52.2			35.0	37.0	12.9	64.2		588.7	6.4	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Max		Max	Hold	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
70th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
50th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
30th %ile Green (s)	15.5	15.5		15.5	15.5	15.5	39.5	39.5		10.0	54.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
10th %ile Green (s)	11.0	11.0		11.0	11.0	11.0	39.5	39.5		10.0	54.5	
10th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
Queue Length 50th (ft)		96			48	78	5	~542		~548	59	
Queue Length 95th (ft)		#190			97	140	16	#676		#758	82	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		290			276	348	383	1593		297	2248	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.67			0.38	0.48	0.04	1.06		2.25	0.25	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 82.7	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 85	
50th %ile Actuated Cycle: 85	
30th %ile Actuated Cycle: 81.5	
10th %ile Actuated Cycle: 77	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Copy of Analysis\2. 2025 Background\AM.syn Synchro 7 - Report
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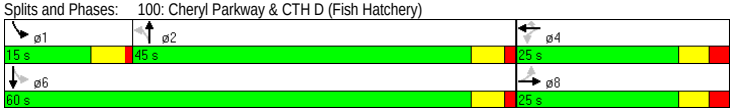
Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	300	15	1250	270	600	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1698			1720	1508	1715	3332		1719	3408	
Flt Permitted		0.71			0.67	1.00	0.44	1.00		0.09	1.00	
Satd. Flow (perm)		1257			1198	1508	801	3332		162	3408	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	144	22	28	100	6	167	17	1389	300	667	528	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	194	0	0	106	167	17	1689	0	667	556	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		16.6			16.6	16.6	39.6	39.6		54.6	54.6	
Effective Green, g (s)		16.6			16.6	16.6	39.6	39.6		54.6	54.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.48	0.48		0.66	0.66	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		252			240	303	384	1595		295	2250	
v/s Ratio Prot								0.51		c0.27	0.16	
v/s Ratio Perm		c0.15			0.09	0.11	0.02			c1.22		
v/c Ratio		0.77			0.44	0.55	0.04	1.06		2.26	0.25	
Uniform Delay, d1		31.2			29.0	29.7	11.5	21.6		25.9	5.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.6			1.5	2.4	0.1	40.0		578.2	0.1	
Delay (s)		44.8			30.5	32.1	11.5	61.5		604.1	5.8	
Level of Service		D			C	C	B	E		F	A	
Approach Delay (s)		44.8			31.5			61.0			332.1	
Approach LOS		D			C			E			F	

Intersection Summary					
HCM Average Control Delay	155.3	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.83				
Actuated Cycle Length (s)	82.7	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	106.8%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	640	15	5	290	25	10	15	10	15	5	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.989			0.962			0.926	
Flt Protected		0.992			0.999			0.986			0.984	
Satd. Flow (prot)	0	1790	0	0	1788	0	0	1716	0	0	1649	0
Flt Permitted		0.992			0.999			0.986			0.984	
Satd. Flow (perm)	0	1790	0	0	1788	0	0	1716	0	0	1649	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	711	17	6	322	28	11	17	11	17	6	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	867	0	0	356	0	0	39	0	0	51	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	640	15	5	290	25	10	15	10	15	5	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	139	711	17	6	322	28	11	17	11	17	6	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.80			0.80	0.80	0.80	0.80	0.80	
vC, conflicting volume	355			733			1385	1368	729	1374	1363	346
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	355			546			1357	1336	542	1343	1329	346
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			99			86	84	97	79	95	96
cM capacity (veh/h)	1182			808			82	106	426	78	107	684

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	867	356	39	50
Volume Left	139	6	11	17
Volume Right	17	28	11	28
cSH	1182	808	122	164
Volume to Capacity	0.12	0.01	0.32	0.31
Queue Length 95th (ft)	10	1	31	30
Control Delay (s)	2.8	0.2	47.7	36.4
Lane LOS	A	A	E	E
Approach Delay (s)	2.8	0.2	47.7	36.4
Approach LOS			E	E

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	105	5	70	510	170	30	295	295	30	65	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.969			0.936				0.850
Flt Protected		0.985			0.995			0.998			0.985	
Satd. Flow (prot)	0	1782	1538	0	1745	0	0	1690	0	0	1782	1538
Flt Permitted		0.985			0.995			0.998			0.985	
Satd. Flow (perm)	0	1782	1538	0	1745	0	0	1690	0	0	1782	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	117	6	78	567	189	33	328	328	33	72	294
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	167	6	0	834	0	0	689	0	0	105	294
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	105	5	70	510	170	30	295	295	30	65	265
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	117	6	78	567	189	33	328	328	33	72	294
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1179	871	82	771	1002	502	372			661		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1179	871	82	771	1002	502	372			661		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	56	99	60	0	66	97			96		
cM capacity (veh/h)	0	265	961	193	222	559	1166			910		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	167	6	833	689	106	294
Volume Left	50	0	78	33	33	0
Volume Right	0	6	189	328	0	294
cSH	0	961	253	1166	910	1700
Volume to Capacity	Err	0.01	3.29	0.03	0.04	0.17
Queue Length 95th (ft)	Err	0	Err	2	3	0
Control Delay (s)	Err	8.8	Err	0.8	3.1	0.0
Lane LOS	F	A	F	A	A	
Approach Delay (s)	Err		Err	0.8	0.8	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	103.6%	ICU Level of Service	G	
Analysis Period (min)	15			

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	850	170	110	485	0	0	0	0	535	1	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.179							0.952	
Satd. Flow (perm)	0	4451	1538	324	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	944	94	122	539	0	0	0	0	594	1	744
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	944	94	122	539	0	0	0	0	0	595	744
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	38.0	38.0	12.0	50.0	0.0	0.0	0.0	0.0	30.0	30.0	30.0
Total Split (%)	0.0%	47.5%	47.5%	15.0%	62.5%	0.0%	0.0%	0.0%	0.0%	37.5%	37.5%	37.5%
Maximum Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

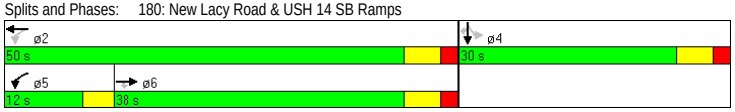
Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.54	0.15	0.41	0.31						1.00	0.80
Control Delay		19.9	16.4	8.6	3.6						68.3	33.4
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		19.9	16.4	8.6	3.6						68.3	33.4
90th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		32.6	32.6	7.9	44.0					24.0	24.0	24.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		32.3	32.3	7.1	42.9					25.1	25.1	25.1
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		29.0	29.0	6.4	38.9					29.1	29.1	29.1
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		32.4	32.4	0.0	32.4					35.6	35.6	35.6
10th %ile Term Code		Coord	Coord	Skip	Coord					Max	Max	Max
Queue Length 50th (ft)		141	29	49	63						~343	198
Queue Length 95th (ft)		184	60	0	0						#549	#321
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		1795	620	322	1891						594	933
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.53	0.15	0.38	0.29						1.00	0.80

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 77 (96%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	850	170	110	485	0	0	0	0	535	1	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438						1723	2707
Flt Permitted		1.00	1.00	0.18	1.00						0.95	1.00
Satd. Flow (perm)		4451	1538	324	3438						1723	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	944	94	122	539	0	0	0	0	594	1	744
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	944	94	122	539	0	0	0	0	0	595	744
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		30.9	30.9	40.4	40.4						27.6	27.6
Effective Green, g (s)		30.9	30.9	40.4	40.4						27.6	27.6
Actuated g/C Ratio		0.39	0.39	0.50	0.50						0.35	0.35
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		1719	594	268	1736						594	934
v/s Ratio Prot		c0.21		c0.03	0.16							
v/s Ratio Perm			0.06	0.20							0.35	0.27
v/c Ratio		0.55	0.16	0.46	0.31						1.00	0.80
Uniform Delay, d1		19.1	16.0	11.5	11.6						26.2	23.7
Progression Factor		1.00	1.00	0.56	0.28						1.00	1.00
Incremental Delay, d2		1.3	0.6	0.4	0.4						37.3	4.5
Delay (s)		20.4	16.6	6.9	3.7						63.5	28.1
Level of Service		C	B	A	A						E	C
Approach Delay (s)		20.0			4.3			0.0			43.9	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM Average Control Delay	27.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	690	695	0	0	355	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	767	772	0	0	394	264	267	1	72	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	767	772	0	0	394	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

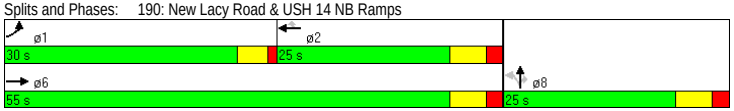
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.83	0.65			0.36	0.54		0.79	0.24			
Control Delay	18.2	9.4			23.9	30.2		46.9	27.7			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	18.2	9.5			23.9	30.2		46.9	27.7			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	24.8	49.0			19.7	19.7	19.0	19.0	19.0			
70th %ile Term Code	Gap	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	22.7	51.3			24.1	24.1	16.7	16.7	16.7			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	20.4	54.0			29.1	29.1	14.0	14.0	14.0			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	17.1	57.8			36.2	36.2	10.2	10.2	10.2			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	181	115			81	111		126	30			
Queue Length 95th (ft)	246	m170			132	#229		202	63			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1063	1182			1101	492		409	365			
Starvation Cap Reductn	0	14			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.72	0.66			0.36	0.54		0.66	0.20			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	690	695	0	0	355	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	767	772	0	0	394	264	267	1	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	767	772	0	0	394	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	22.1	52.2			25.6	25.6		15.8	15.8			
Effective Green, g (s)	22.1	52.2			25.6	25.6		15.8	15.8			
Actuated g/C Ratio	0.28	0.65			0.32	0.32		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	921	1181			1100	492		340	304			
v/s Ratio Prot	c0.23	c0.43			0.11							
v/s Ratio Perm						0.17		0.16	0.05			
v/c Ratio	0.83	0.65			0.36	0.54		0.79	0.24			
Uniform Delay, d1	27.2	8.4			20.9	22.3		30.5	27.0			
Progression Factor	0.39	0.85			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.5	1.2			0.9	4.2		10.6	0.1			
Delay (s)	16.1	8.3			21.8	26.5		41.1	27.2			
Level of Service	B	A			C	C		D	C			
Approach Delay (s)		12.2			23.7			38.2			0.0	
Approach LOS		B			C			D			A	

Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	230	45	30	95	275	55	825	90	120	270	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	0.99		0.99		0.98	1.00	0.99	
Frt		0.975			0.889				0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1760	0	1719	1585	0	1719	3438	1538	1719	3239	0
Flt Permitted	0.178			0.574			0.492			0.136		
Satd. Flow (perm)	322	1760	0	1033	1585	0	886	3438	1511	246	3239	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	422	256	50	33	106	306	61	917	50	133	300	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	422	306	0	33	412	0	61	917	50	133	450	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	1.05	0.40		0.15	1.24		0.25	0.97	0.12	0.53	0.32	
Control Delay	83.6	19.6		31.8	166.5		29.1	55.1	25.8	23.2	17.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	83.6	19.6		31.8	166.5		29.1	55.1	25.8	23.2	17.4	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	11.9	41.4	
90th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	9.9	39.4	
70th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	8.6	38.1	
50th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	7.4	36.9	
30th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	5.7	35.2	
10th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	~205	114		15	~290		26	265	21	44	84	
Queue Length 95th (ft)	#410	191		42	#488		63	#416	51	80	120	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	401	764		216	331		245	950	418	357	1626	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	1.05	0.40		0.15	1.24		0.25	0.97	0.12	0.37	0.28	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 88.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 91.9	
70th %ile Actuated Cycle: 89.9	
50th %ile Actuated Cycle: 88.6	
30th %ile Actuated Cycle: 87.4	
10th %ile Actuated Cycle: 85.7	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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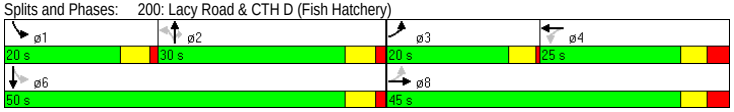
Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	230	45	30	95	275	55	825	90	120	270	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.89		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1758		1706	1585		1711	3438	1511	1719	3238	
Flt Permitted	0.18	1.00		0.57	1.00		0.49	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	322	1758		1030	1585		886	3438	1511	245	3238	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	422	256	50	33	106	306	61	917	50	133	300	150
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	422	306	0	33	412	0	61	917	50	133	450	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	38.2	38.2	
Effective Green, g (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	38.2	38.2	
Actuated g/C Ratio	0.43	0.43		0.21	0.21		0.28	0.28	0.28	0.43	0.43	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	392	763		215	331		245	950	417	250	1394	
v/s Ratio Prot	c0.19	0.17			c0.26			c0.27		c0.05	0.14	
v/s Ratio Perm	0.27			0.03			0.07		0.03	0.18		
v/c Ratio	1.08	0.40		0.15	1.24		0.25	0.97	0.12	0.53	0.32	
Uniform Delay, d1	23.8	17.2		28.7	35.1		24.9	31.7	24.0	19.0	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	67.4	0.5		0.5	133.0		0.7	21.1	0.2	1.1	0.2	
Delay (s)	91.2	17.7		29.2	168.1		25.7	52.8	24.2	20.1	16.9	
Level of Service	F	B		C	F		C	D	C	C	B	
Approach Delay (s)		60.3			157.8			49.8			17.6	
Approach LOS		E			F			D			B	

Intersection Summary					
HCM Average Control Delay	63.1	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.02				
Actuated Cycle Length (s)	88.7	Sum of lost time (s)		21.0	
Intersection Capacity Utilization	90.3%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	210	195	85	195	15	135	30	30	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.989			0.979			0.962	
Flt Protected		0.984		0.950				0.966			0.986	
Satd. Flow (prot)	0	1781	1538	1719	1790	0	0	1711	0	0	1716	0
Flt Permitted		0.984		0.950				0.966			0.986	
Satd. Flow (perm)	0	1781	1538	1719	1790	0	0	1711	0	0	1716	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	233	217	94	217	17	150	33	33	11	17	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	350	217	94	234	0	0	216	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	210	195	85	195	15	135	30	30	10	15	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	233	217	94	217	17	150	33	33	11	17	11
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	238			455			902	899	243	941	1107	235
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			455			902	899	243	941	1107	235
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			91			25	85	96	94	90	99
cM capacity (veh/h)	1306			1086			201	227	782	176	171	790

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	350	217	94	233	217	39
Volume Left	117	0	94	0	150	11
Volume Right	0	217	0	17	33	11
cSH	1306	1700	1086	1700	231	223
Volume to Capacity	0.09	0.13	0.09	0.14	0.94	0.17
Queue Length 95th (ft)	7	0	7	0	204	15
Control Delay (s)	3.2	0.0	8.6	0.0	88.7	24.6
Lane LOS	A		A		F	C
Approach Delay (s)	2.0		2.5		88.7	24.6
Approach LOS					F	C

Intersection Summary				
Average Delay	19.2			
Intersection Capacity Utilization	56.0%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	165	10	1	225	40	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.896	
Flt Protected			0.950		0.989	
Satd. Flow (prot)	1810	1538	1719	1810	1603	0
Flt Permitted			0.950		0.989	
Satd. Flow (perm)	1810	1538	1719	1810	1603	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	183	11	1	250	44	150
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	11	1	250	194	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	165	10	1	225	40	135
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	183	11	1	250	44	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			194		436	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			194		436	183
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	82
cM capacity (veh/h)			1361		572	851

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	183	11	1	250	194
Volume Left	0	0	1	0	44
Volume Right	0	11	0	0	150
cSH	1700	1700	1361	1700	766
Volume to Capacity	0.11	0.01	0.00	0.15	0.25
Queue Length 95th (ft)	0	0	0	0	25
Control Delay (s)	0.0	0.0	7.6	0.0	11.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		11.3
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		29.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	275	380	20	15	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1806	1810	1538	1646	0
Flt Permitted		0.998			0.976	
Satd. Flow (perm)	0	1806	1810	1538	1646	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	306	422	22	17	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	317	422	22	34	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	275	380	20	15	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	306	422	22	17	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	444				750	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444				750	422
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1100				371	625

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	317	422	22	33
Volume Left	11	0	0	17
Volume Right	0	0	22	17
cSH	1100	1700	1700	466
Volume to Capacity	0.01	0.25	0.01	0.07
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	0.4	0.0	0.0	13.3
Lane LOS	A			B
Approach Delay (s)	0.4	0.0		13.3
Approach LOS				B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		32.6%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	130	1	180	325	50	20	410	380	10	75	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.988			0.937			0.947	
Flt Protected		0.973			0.984			0.999			0.996	
Satd. Flow (prot)	0	1761	0	0	1759	0	0	1694	0	0	1707	0
Flt Permitted		0.973			0.984			0.999			0.996	
Satd. Flow (perm)	0	1761	0	0	1759	0	0	1694	0	0	1707	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	178	144	1	200	361	56	22	456	422	11	83	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	323	0	0	617	0	0	900	0	0	155	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	160	130	1	180	325	50	20	410	380	10	75	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	178	144	1	200	361	56	22	456	422	11	83	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1093	1068	124	931	888	677	149			883		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1093	1068	124	931	888	677	149			883		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	31	100	0	0	87	98			99		
cM capacity (veh/h)	0	210	911	105	269	444	1408			751		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	323	617	900	156
Volume Left	178	200	22	11
Volume Right	1	56	422	61
cSH	0	183	1408	751
Volume to Capacity	Err	3.37	0.02	0.01
Queue Length 95th (ft)	Err	Err	1	1
Control Delay (s)	Err	Err	0.4	0.9
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	0.4	0.9
Approach LOS	F	F		

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	89.6%	ICU Level of Service	E	
Analysis Period (min)	15			

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	250	270	295	20	20	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1795	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1795	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	278	300	328	22	22	289
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	300	350	0	22	289
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	250	270	295	20	20	260
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	278	300	328	22	22	289
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355				1204	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				1204	349
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	77				85	58
cM capacity (veh/h)	1182				152	682

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	278	300	350	22	289
Volume Left	278	0	0	22	0
Volume Right	0	0	22	0	289
cSH	1182	1700	1700	152	682
Volume to Capacity	0.23	0.18	0.21	0.15	0.42
Queue Length 95th (ft)	23	0	0	12	53
Control Delay (s)	9.0	0.0	0.0	32.7	14.1
Lane LOS	A			D	B
Approach Delay (s)	4.3		0.0	15.4	
Approach LOS				C	

Intersection Summary				
Average Delay		5.9		
Intersection Capacity Utilization		45.5%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	15	10	5	25	5	1065	55	120	245	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.969		0.950			0.950		
Satd. Flow (prot)	0	1732	1538	0	1753	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.957			0.969		0.950			0.950		
Satd. Flow (perm)	0	1732	1538	0	1753	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	17	11	6	28	6	1183	61	133	272	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	17	0	17	28	6	1183	61	133	272	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	5	15	10	5	25	5	1065	55	120	245	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	6	17	11	6	28	6	1183	61	133	272	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1774	1804	282	1763	1766	1193	299			1249		
vC1, stage 1 conf vol	544	544		1199	1199							
vC2, stage 2 conf vol	1230	1261		563	566							
vCu, unblocked vol	1774	1804	282	1763	1766	1193	299			1249		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	98	94	97	88	100			76		
cM capacity (veh/h)	47	100	743	188	211	222	1240			545		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	56	17	17	28	6	1183	61	133	272	22
Volume Left	50	0	11	0	6	0	0	133	0	0
Volume Right	0	17	0	28	0	0	61	0	0	22
cSH	50	743	195	222	1240	1700	1700	545	1700	1700
Volume to Capacity	1.11	0.02	0.09	0.12	0.00	0.70	0.04	0.24	0.16	0.01
Queue Length 95th (ft)	123	2	7	11	0	0	0	24	0	0
Control Delay (s)	294.1	10.0	25.2	23.5	7.9	0.0	0.0	13.7	0.0	0.0
Lane LOS	F	A	D	C	A			B		
Approach Delay (s)	228.5		24.1		0.0			4.3		
Approach LOS	F		C							

Intersection Summary				
Average Delay	10.8			
Intersection Capacity Utilization	82.7%	ICU Level of Service		E
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	70	35	10	10	1	10	1	25	10	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.950			0.988			0.906			0.941	
Flt Protected	0.950			0.950				0.986			0.986	
Satd. Flow (prot)	1719	1719	0	1719	1788	0	0	1616	0	0	1679	0
Flt Permitted	0.950			0.950				0.986			0.986	
Satd. Flow (perm)	1719	1719	0	1719	1788	0	0	1616	0	0	1679	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	78	39	11	11	1	11	1	28	11	11	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	117	0	11	12	0	0	40	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	70	35	10	10	1	10	1	25	10	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	78	39	11	11	1	11	1	28	11	11	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			122			263	242	107	250	261	22
vC1, stage 1 conf vol							202	202		39	39	
vC2, stage 2 conf vol							61	39		211	222	
vCu, unblocked vol	17			122			263	242	107	250	261	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	100	97	98	98	98
cM capacity (veh/h)	1574			1441			724	676	931	701	657	1038

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	117	11	12	40	39
Volume Left	50	0	11	0	11	11
Volume Right	0	39	0	1	28	17
cSH	1574	1700	1441	1700	854	797
Volume to Capacity	0.03	0.07	0.01	0.01	0.05	0.05
Queue Length 95th (ft)	2	0	1	0	4	4
Control Delay (s)	7.4	0.0	7.5	0.0	9.4	9.7
Lane LOS	A		A		A	A
Approach Delay (s)	2.2		3.6		9.4	9.7
Approach LOS					A	A

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	21.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	205	725	40	55	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	22	228	806	44	61	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	228	806	44	61	183
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	205	725	40	55	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	228	806	44	61	183
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1121	816			855	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1121	816			855	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	38			92	
cM capacity (veh/h)	205	369			769	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	22	228	806	44	61	183
Volume Left	22	0	0	0	61	0
Volume Right	0	228	0	44	0	0
cSH	205	369	1700	1700	769	1700
Volume to Capacity	0.11	0.62	0.47	0.03	0.08	0.11
Queue Length 95th (ft)	9	99	0	0	6	0
Control Delay (s)	24.6	29.2	0.0	0.0	10.1	0.0
Lane LOS	C	D			B	
Approach Delay (s)	28.8		0.0		2.5	
Approach LOS	D					

Intersection Summary				
Average Delay		5.8		
Intersection Capacity Utilization		58.1%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	155	1	1	195	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.900	
Flt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Flt Permitted					0.987	
Satd. Flow (perm)	1808	0	0	1810	1607	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	172	1	1	217	6	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	173	0	0	218	23	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	155	1	1	195	5	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	172	1	1	217	6	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			173		392	173
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			173		392	173
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1385		606	863

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	173	218	22
Volume Left	0	1	6
Volume Right	1	0	17
cSH	1700	1385	780
Volume to Capacity	0.10	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		21.1%	ICU Level of Service A
Analysis Period (min)		15	

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	45	35	5	60	20	105	700	1	10	215	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.969						0.984	
Flt Protected		0.974			0.997			0.994			0.998	
Satd. Flow (prot)	0	1713	0	0	1748	0	0	1799	0	0	1777	0
Flt Permitted		0.974			0.997			0.994			0.998	
Satd. Flow (perm)	0	1713	0	0	1748	0	0	1799	0	0	1777	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	100	50	39	6	67	22	117	778	1	11	239	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	189	0	0	95	0	0	896	0	0	283	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	45	35	5	60	20	105	700	1	10	215	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	50	39	6	67	22	117	778	1	11	239	33
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1355	1300	266	1363	1316	788	277			784		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1355	1300	266	1363	1316	788	277			784		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	65	95	93	52	94	91			99		
cM capacity (veh/h)	67	141	760	77	138	383	1263			818		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	189	94	896	283
Volume Left	100	6	117	11
Volume Right	39	22	1	33
cSH	99	154	1263	818
Volume to Capacity	1.91	0.61	0.09	0.01
Queue Length 95th (ft)	393	82	8	1
Control Delay (s)	514.6	59.7	2.3	0.5
Lane LOS	F	F	A	A
Approach Delay (s)	514.6	59.7	2.3	0.5
Approach LOS	F	F		

Intersection Summary				
Average Delay	71.8			
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	735	5	610	15	385	1330	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99	0.98	1.00	1.00		1.00	1.00	
Frt		0.962				0.850		0.996			0.990	
Flt Protected		0.969			0.957		0.950			0.950		
Satd. Flow (prot)	0	1678	0	0	1732	1538	1719	3422	0	1719	3398	0
Flt Permitted		0.644			0.694		0.137			0.260		
Satd. Flow (perm)	0	1112	0	0	1249	1510	248	3422	0	470	3398	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	22	233	28	408	6	678	17	428	1478	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	0	0	261	408	6	695	0	428	1584	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.27			0.82	1.05	0.06	0.53		0.96	0.79	
Control Delay		28.7			51.4	92.9	14.8	18.7		45.4	15.1	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.7			51.4	92.9	14.8	18.7		45.4	15.1	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Hold	Hold		Max	Max	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	37.3	37.3		10.0	52.3	
70th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	30.3	30.3		10.0	45.3	
50th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
30th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	24.0	24.0		10.0	39.0	
30th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
10th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	16.7	16.7		10.0	31.7	
10th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
Queue Length 50th (ft)		30			116	~218	2	125		95	265	
Queue Length 95th (ft)		76			#283	#443	9	171		#243	346	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		285			320	387	132	1825		448	2500	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.27			0.82	1.05	0.05	0.38		0.96	0.63	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 75.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 82.8	
50th %ile Actuated Cycle: 75.8	
30th %ile Actuated Cycle: 69.5	
10th %ile Actuated Cycle: 62.2	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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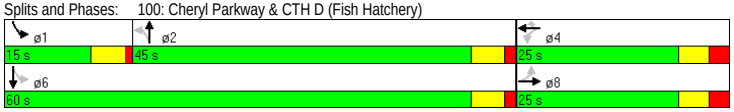
Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	735	5	610	15	385	1330	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1674			1724	1511	1718	3423		1719	3398	
Flt Permitted		0.64			0.69	1.00	0.14	1.00		0.26	1.00	
Satd. Flow (perm)		1113			1249	1511	249	3423		470	3398	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	50	6	22	233	28	408	6	678	17	428	1478	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	78	0	0	261	408	6	695	0	428	1584	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		19.3			19.3	19.3	29.1	29.1		44.2	44.2	
Effective Green, g (s)		19.3			19.3	19.3	29.1	29.1		44.2	44.2	
Actuated g/C Ratio		0.26			0.26	0.26	0.39	0.39		0.59	0.59	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		286			321	389	97	1328		445	2003	
v/s Ratio Prot								0.20		c0.13	0.47	
v/s Ratio Perm		0.07			0.21	c0.27	0.02			c0.44		
v/c Ratio		0.27			0.81	1.05	0.06	0.52		0.96	0.79	
Uniform Delay, d1		22.2			26.2	27.8	14.4	17.6		10.7	11.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			14.8	59.0	0.4	0.5		32.6	2.3	
Delay (s)		22.9			41.0	86.8	14.8	18.1		43.3	14.2	
Level of Service		C			D	F	B	B		D	B	
Approach Delay (s)		22.9			69.0			18.1			20.4	
Approach LOS		C			E			B			C	

Intersection Summary					
HCM Average Control Delay	29.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.95				
Actuated Cycle Length (s)	75.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	84.7%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	390	10	15	805	15	40	5	10	55	20	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.976			0.905	
Flt Protected		0.991			0.999			0.965			0.989	
Satd. Flow (prot)	0	1788	0	0	1804	0	0	1704	0	0	1620	0
Flt Permitted		0.991			0.999			0.965			0.989	
Satd. Flow (perm)	0	1788	0	0	1804	0	0	1704	0	0	1620	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	100	433	11	17	894	17	44	6	11	61	22	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	544	0	0	928	0	0	61	0	0	277	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	390	10	15	805	15	40	5	10	55	20	175
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	433	11	17	894	17	44	6	11	61	22	194
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	916			449			1791	1593	449	1599	1591	913
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	916			306			1830	1606	305	1612	1603	913
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			0	93	98	0	71	40
cM capacity (veh/h)	729			1085			14	77	635	59	77	325

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	544	928	61	278
Volume Left	100	17	44	61
Volume Right	11	17	11	194
cSH	729	1085	19	144
Volume to Capacity	0.14	0.02	3.29	1.93
Queue Length 95th (ft)	12	1	Err	539
Control Delay (s)	3.6	0.4	Err	494.3
Lane LOS	A	A	F	F
Approach Delay (s)	3.6	0.4	Err	494.3
Approach LOS			F	F

Intersection Summary				
Average Delay	414.5			
Intersection Capacity Utilization	95.0%	ICU Level of Service	F	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	520	25	345	170	45	10	75	80	165	335	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.989			0.934				0.850
Flt Protected		0.985			0.970			0.997			0.984	
Satd. Flow (prot)	0	1782	1538	0	1736	0	0	1685	0	0	1781	1538
Flt Permitted		0.985			0.970			0.997			0.984	
Satd. Flow (perm)	0	1782	1538	0	1736	0	0	1685	0	0	1781	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	244	578	28	383	189	50	11	83	89	183	372	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	822	28	0	622	0	0	183	0	0	555	100
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	220	520	25	345	170	45	10	75	80	165	335	90
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	244	578	28	383	189	50	11	83	89	183	372	100
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1043	943	382	1216	999	138	477			177		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1043	943	382	1216	999	138	477			177		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	96	0	8	94	99			87		
cM capacity (veh/h)	33	221	653	0	205	895	1065			1375		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	822	28	622	183	556	100
Volume Left	244	0	383	11	183	0
Volume Right	0	28	50	89	0	100
cSH	83	653	0	1065	1375	1700
Volume to Capacity	9.93	0.04	Err	0.01	0.13	0.06
Queue Length 95th (ft)	Err	3	Err	1	12	0
Control Delay (s)	Err	10.8	Err	0.6	3.6	0.0
Lane LOS	F	B	F	A	A	
Approach Delay (s)	9672.6		Err	0.6	3.0	
Approach LOS	F		F			

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		120.7%	ICU Level of Service	H
Analysis Period (min)		15		

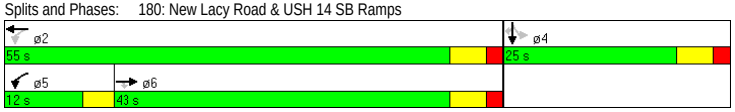
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1040	210	75	335	0	0	0	0	375	1	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.144							0.952	
Satd. Flow (perm)	0	4451	1538	261	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1156	117	83	372	0	0	0	0	417	1	518
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1156	117	83	372	0	0	0	0	0	418	518
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.53	0.16	0.30	0.18						0.92	0.73
Control Delay		15.5	12.4	5.6	2.3						59.2	35.0
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		15.5	12.4	5.6	2.3						59.2	35.0
90th %ile Green (s)		38.1	38.1	7.4	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
70th %ile Green (s)		39.0	39.0	6.5	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
30th %ile Green (s)		35.4	35.4	6.0	44.9					23.1	23.1	23.1
30th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
10th %ile Green (s)		42.9	42.9	0.0	42.9					25.1	25.1	25.1
10th %ile Term Code		Coord	Coord	Skip	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		152	30	35	43						~217	139
Queue Length 95th (ft)		202	61	0	0						#397	#222
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2187	755	316	2106						453	712
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.53	0.15	0.26	0.18						0.92	0.73

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
* User Entered Value	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1040	210	75	335	0	0	0	0	375	1	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.14	1.00						0.95	1.00
Satd. Flow (perm)		4451	1538	261	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1156	117	83	372	0	0	0	0	417	1	518
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1156	117	83	372	0	0	0	0	0	418	518
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		38.3	38.3	47.0	47.0						21.0	21.0
Effective Green, g (s)		38.3	38.3	47.0	47.0						21.0	21.0
Actuated g/C Ratio		0.48	0.48	0.59	0.59						0.26	0.26
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2131	736	248	2020						453	711
v/s Ratio Prot		c0.26		c0.02	0.11							
v/s Ratio Perm			0.08	0.17							0.24	0.19
v/c Ratio		0.54	0.16	0.33	0.18						0.92	0.73
Uniform Delay, d1		14.7	11.8	8.4	7.6						28.7	26.9
Progression Factor		1.00	1.00	0.51	0.28						1.00	1.00
Incremental Delay, d2		1.0	0.5	0.3	0.2						24.0	3.2
Delay (s)		15.7	12.2	4.6	2.4						52.7	30.1
Level of Service		B	B	A	A						D	C
Approach Delay (s)		15.4			2.8			0.0			40.2	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	21.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	59.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	845	570	0	0	245	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	939	633	0	0	272	183	183	1	50	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	939	633	0	0	272	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

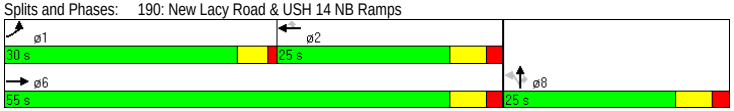
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.51			0.26	0.39		0.64	0.19			
Control Delay	20.9	5.8			23.5	27.2		41.0	29.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	20.9	5.8			23.5	27.2		41.0	29.1			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	27.1	55.1			23.5	23.5	12.9	12.9	12.9			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	25.0	57.3			27.8	27.8	10.7	10.7	10.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	21.5	58.0			32.0	32.0	10.0	10.0	10.0			
10th %ile Term Code	Gap	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	216	62			54	73		87	22			
Queue Length 95th (ft)	#323	m118			93	142		142	48			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1117	1236			1043	466		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.84	0.51			0.26	0.39		0.45	0.14			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 55 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	845	570	0	0	245	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	939	633	0	0	272	183	183	1	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	939	633	0	0	272	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	25.9	54.6			24.2	24.2		13.4	13.4			
Effective Green, g (s)	25.9	54.6			24.2	24.2		13.4	13.4			
Actuated g/C Ratio	0.32	0.68			0.30	0.30		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1080	1235			1040	465		289	258			
v/s Ratio Prot	c0.28	c0.35			0.08							
v/s Ratio Perm						0.12		0.11	0.03			
v/c Ratio	0.87	0.51			0.26	0.39		0.64	0.19			
Uniform Delay, d1	25.5	6.2			21.1	22.1		31.0	28.7			
Progression Factor	0.45	0.70			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.5	0.9			0.6	2.5		3.4	0.1			
Delay (s)	18.0	5.2			21.7	24.6		34.4	28.8			
Level of Service	B	A			C	C		C	C			
Approach Delay (s)		12.9			22.9			33.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	135	75	115	240	195	85	340	50	310	870	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99	0.99		1.00		0.98	1.00	0.99	
Frt		0.947			0.933				0.850		0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1704	0	1719	1673	0	1719	3438	1538	1719	3247	0
Flt Permitted	0.178			0.613			0.160			0.400		
Satd. Flow (perm)	322	1704	0	1103	1673	0	289	3438	1511	723	3247	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	150	83	128	267	217	94	378	28	344	967	456
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	233	0	128	484	0	94	378	28	344	1423	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.52	0.37		0.55	1.36		1.13	0.38	0.06	0.67	0.88	
Control Delay	24.8	22.7		42.0	211.5		176.1	27.2	25.1	21.2	28.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	24.8	22.7		42.0	211.5		176.1	27.2	25.1	21.2	28.1	
90th %ile Green (s)	13.2	35.7		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
70th %ile Green (s)	10.9	33.4		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
70th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
50th %ile Green (s)	9.4	31.9		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
50th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
30th %ile Green (s)	8.0	30.5		18.5	18.5		26.7	26.7	26.7	12.8	44.5	
30th %ile Term Code	Gap	Hold		Max	Max		Hold	Hold	Hold	Gap	Max	
10th %ile Green (s)	5.9	28.4		18.5	18.5		24.5	24.5	24.5	9.7	39.2	
10th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	53	95		64	~362		~63	90	12	112	351	
Queue Length 95th (ft)	93	155		129	#578		#167	137	33	192	#546	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	383	752		234	355		83	983	432	535	1657	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.38	0.31		0.55	1.36		1.13	0.38	0.06	0.64	0.86	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 87.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 92.2	
70th %ile Actuated Cycle: 89.9	
50th %ile Actuated Cycle: 88.4	
30th %ile Actuated Cycle: 87	
10th %ile Actuated Cycle: 79.6	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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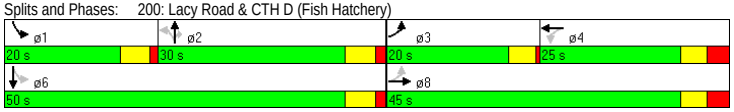
Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	135	75	115	240	195	85	340	50	310	870	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.93		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1697		1704	1673		1717	3438	1512	1718	3247	
Flt Permitted	0.18	1.00		0.61	1.00		0.16	1.00	1.00	0.40	1.00	
Satd. Flow (perm)	322	1697		1101	1673		289	3438	1512	724	3247	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	144	150	83	128	267	217	94	378	28	344	967	456
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	233	0	128	484	0	94	378	28	344	1423	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	31.9	31.9		18.5	18.5		25.0	25.0	25.0	43.4	43.4	
Effective Green, g (s)	31.9	31.9		18.5	18.5		25.0	25.0	25.0	43.4	43.4	
Actuated g/C Ratio	0.37	0.37		0.21	0.21		0.29	0.29	0.29	0.50	0.50	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	268	620		233	355		83	985	433	512	1614	
v/s Ratio Prot	c0.06	0.14			c0.29			0.11		0.10	c0.44	
v/s Ratio Perm	0.14			0.12			c0.33		0.02	0.23		
v/c Ratio	0.54	0.38		0.55	1.36		1.13	0.38	0.06	0.67	0.88	
Uniform Delay, d1	21.3	20.4		30.7	34.4		31.1	25.0	22.6	14.3	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.5		3.3	180.7		139.1	0.3	0.1	2.7	6.2	
Delay (s)	22.4	20.9		34.0	215.1		170.2	25.3	22.7	17.0	25.8	
Level of Service	C	C		C	F		F	C	C	B	C	
Approach Delay (s)		21.5			177.2			52.4			24.1	
Approach LOS		C			F			D			C	

Intersection Summary					
HCM Average Control Delay	56.9	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.11				
Actuated Cycle Length (s)	87.3	Sum of lost time (s)		21.5	
Intersection Capacity Utilization	100.6%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	250	150	25	265	10	220	15	75	20	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.967			0.904	
Flt Protected		0.994		0.950				0.966			0.994	
Satd. Flow (prot)	0	1799	1538	1719	1800	0	0	1690	0	0	1626	0
Flt Permitted		0.994		0.950				0.966			0.994	
Satd. Flow (perm)	0	1799	1538	1719	1800	0	0	1690	0	0	1626	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	278	167	28	294	11	244	17	83	22	33	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	317	167	28	305	0	0	344	0	0	188	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	250	150	25	265	10	220	15	75	20	30	120
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	278	167	28	294	11	244	17	83	22	33	133
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	311			449			866	727	288	813	888	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			449			866	727	288	813	888	310
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			0	95	89	91	87	81
cM capacity (veh/h)	1228			1091			188	325	738	236	262	717

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	317	167	28	306	344	189
Volume Left	39	0	28	0	244	22
Volume Right	0	167	0	11	83	133
cSH	1228	1700	1091	1700	235	464
Volume to Capacity	0.03	0.10	0.03	0.18	1.47	0.41
Queue Length 95th (ft)	2	0	2	0	503	49
Control Delay (s)	1.3	0.0	8.4	0.0	271.1	18.0
Lane LOS	A		A		F	C
Approach Delay (s)	0.8		0.7		271.1	18.0
Approach LOS					F	C

Intersection Summary				
Average Delay	72.1			
Intersection Capacity Utilization	71.6%	ICU Level of Service		C
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	265	45	185	210	20	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.901	
Flt Protected			0.950		0.987	
Satd. Flow (prot)	1810	1538	1719	1810	1609	0
Flt Permitted			0.950		0.987	
Satd. Flow (perm)	1810	1538	1719	1810	1609	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	294	50	206	233	22	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	294	50	206	233	83	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	265	45	185	210	20	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	294	50	206	233	22	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			344		939	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			344		939	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		91	92
cM capacity (veh/h)			1198		240	738

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	294	50	206	233	83
Volume Left	0	0	206	0	22
Volume Right	0	50	0	0	61
cSH	1700	1700	1198	1700	475
Volume to Capacity	0.17	0.03	0.17	0.14	0.18
Queue Length 95th (ft)	0	0	15	0	16
Control Delay (s)	0.0	0.0	8.6	0.0	14.2
Lane LOS			A		B
Approach Delay (s)	0.0		4.0		14.2
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		38.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	410	325	15	25	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.962	
Flt Protected		0.999			0.965	
Satd. Flow (prot)	0	1808	1810	1538	1680	0
Flt Permitted		0.999			0.965	
Satd. Flow (perm)	0	1808	1810	1538	1680	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	456	361	17	28	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	467	361	17	39	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	410	325	15	25	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	456	361	17	28	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	378				839	361
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	378				839	361
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	98
cM capacity (veh/h)	1164				329	677

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	467	361	17	39
Volume Left	11	0	0	28
Volume Right	0	0	17	11
cSH	1164	1700	1700	385
Volume to Capacity	0.01	0.21	0.01	0.10
Queue Length 95th (ft)	1	0	0	8
Control Delay (s)	0.3	0.0	0.0	15.4
Lane LOS	A			C
Approach Delay (s)	0.3	0.0		15.4
Approach LOS				C

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		39.6%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	335	35	180	145	20	20	80	1	60	470	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.992			0.999			0.967	
Flt Protected		0.993			0.975			0.990			0.996	
Satd. Flow (prot)	0	1777	0	0	1750	0	0	1790	0	0	1743	0
Flt Permitted		0.993			0.975			0.990			0.996	
Satd. Flow (perm)	0	1777	0	0	1750	0	0	1790	0	0	1743	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	72	372	39	200	161	22	22	89	1	67	522	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	483	0	0	383	0	0	112	0	0	783	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	335	35	180	145	20	20	80	1	60	470	175
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	72	372	39	200	161	22	22	89	1	67	522	194
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	999	897	629	1122	994	99	722			95		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	999	897	629	1122	994	99	722			95		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	13	0	92	0	28	98	97			95		
cM capacity (veh/h)	83	255	473	0	223	940	863			1474		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	483	383	112	783
Volume Left	72	200	22	67
Volume Right	39	22	1	194
cSH	201	0	863	1474
Volume to Capacity	2.41	Err	0.03	0.05
Queue Length 95th (ft)	997	Err	2	4
Control Delay (s)	686.9	Err	2.0	1.2
Lane LOS	F	F	A	A
Approach Delay (s)	686.9	Err	2.0	1.2
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		95.7%	ICU Level of Service	F
Analysis Period (min)		15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	190	205	185	15	15	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1791	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1791	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	211	228	206	17	17	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	211	228	223	0	17	178
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	190	205	185	15	15	160
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	228	206	17	17	178
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	227				874	224
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227				874	224
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				94	78
cM capacity (veh/h)	1318				264	801

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	211	228	222	17	178
Volume Left	211	0	0	17	0
Volume Right	0	0	17	0	178
cSH	1318	1700	1700	264	801
Volume to Capacity	0.16	0.13	0.13	0.06	0.22
Queue Length 95th (ft)	14	0	0	5	21
Control Delay (s)	8.3	0.0	0.0	19.6	10.8
Lane LOS	A			C	B
Approach Delay (s)	4.0		0.0	11.5	
Approach LOS				B	

Intersection Summary				
Average Delay		4.7		
Intersection Capacity Utilization		36.5%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	5	60	5	120	5	380	20	25	1160	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.956		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1730	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.954			0.956		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1730	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	6	67	6	133	6	422	22	28	1289	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	6	0	73	133	6	422	22	28	1289	50
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	5	60	5	120	5	380	20	25	1160	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	6	67	6	133	6	422	22	28	1289	50
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1924	1810	1299	1794	1838	432	1344			449		
vC1, stage 1 conf vol	1349	1349		438	438							
vC2, stage 2 conf vol	574	461		1356	1399							
vCu, unblocked vol	1924	1810	1299	1794	1838	432	1344			449		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	99	97	58	97	78	99			97		
cM capacity (veh/h)	157	196	193	157	183	612	501			1091		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	23	6	72	133	6	422	22	28	1289	50
Volume Left	22	0	67	0	6	0	0	28	0	0
Volume Right	0	6	0	133	0	0	22	0	0	50
cSH	158	193	159	612	501	1700	1700	1091	1700	1700
Volume to Capacity	0.15	0.03	0.45	0.22	0.01	0.25	0.01	0.03	0.76	0.03
Queue Length 95th (ft)	13	2	52	21	1	0	0	2	0	0
Control Delay (s)	31.7	24.2	45.3	12.5	12.3	0.0	0.0	8.4	0.0	0.0
Lane LOS	D	C	E	B	B			A		
Approach Delay (s)	30.2		24.0		0.2			0.2		
Approach LOS	D		C							

Intersection Summary					
Average Delay		3.0			
Intersection Capacity Utilization		81.0%	ICU Level of Service		D
Analysis Period (min)		15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	10	1	1	140	10	10	1	1	10	1	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.990			0.990			0.887	
Flt Protected	0.950			0.950				0.959			0.993	
Satd. Flow (prot)	1719	1788	0	1719	1791	0	0	1718	0	0	1594	0
Flt Permitted	0.950			0.950				0.959			0.993	
Satd. Flow (perm)	1719	1788	0	1719	1791	0	0	1718	0	0	1594	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	11	1	1	156	11	11	1	1	11	1	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	12	0	1	167	0	0	13	0	0	73	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	10	1	1	140	10	10	1	1	10	1	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	11	1	1	156	11	11	1	1	11	1	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	172			17			297	246	22	242	241	171
vC1, stage 1 conf vol							72	72		168	168	
vC2, stage 2 conf vol							224	174		73	73	
vCu, unblocked vol	172			17			297	246	22	242	241	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	100	99	100	93
cM capacity (veh/h)	1382			1574			661	689	1038	776	709	858

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	28	12	1	167	13	73
Volume Left	28	0	1	0	11	11
Volume Right	0	1	0	11	1	61
cSH	1382	1700	1574	1700	684	842
Volume to Capacity	0.02	0.01	0.00	0.10	0.02	0.09
Queue Length 95th (ft)	2	0	0	0	1	7
Control Delay (s)	7.7	0.0	7.3	0.0	10.4	9.7
Lane LOS	A		A		B	A
Approach Delay (s)	5.3		0.0		10.4	9.7
Approach LOS					B	A

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	27.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	40	80	250	15	205	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	44	89	278	17	228	906
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	89	278	17	228	906
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	80	250	15	205	815
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	89	278	17	228	906
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1649	288			299	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1649	288			299	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	49	88			82	
cM capacity (veh/h)	87	738			1240	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	44	89	278	17	228	906
Volume Left	44	0	0	0	228	0
Volume Right	0	89	0	17	0	0
cSH	87	738	1700	1700	1240	1700
Volume to Capacity	0.51	0.12	0.16	0.01	0.18	0.53
Queue Length 95th (ft)	56	10	0	0	17	0
Control Delay (s)	83.9	10.5	0.0	0.0	8.6	0.0
Lane LOS	F	B			A	
Approach Delay (s)	35.0		0.0		1.7	
Approach LOS	E					

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	155	5	20	160	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.884	
Flt Protected				0.995	0.993	
Satd. Flow (prot)	1800	0	0	1800	1588	0
Flt Permitted				0.995	0.993	
Satd. Flow (perm)	1800	0	0	1800	1588	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	172	6	22	178	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	178	0	0	200	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	155	5	20	160	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	172	6	22	178	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		397	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		397	175
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1380		593	861

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	178	200	7
Volume Left	0	22	1
Volume Right	6	0	6
cSH	1700	1380	800
Volume to Capacity	0.10	0.02	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	1.0	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	1.0	9.5
Approach LOS			A

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		31.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	50	100	5	45	5	50	85	1	25	575	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.987			0.999			0.983	
Flt Protected		0.997			0.995			0.982			0.998	
Satd. Flow (prot)	0	1653	0	0	1777	0	0	1775	0	0	1775	0
Flt Permitted		0.997			0.995			0.982			0.998	
Satd. Flow (perm)	0	1653	0	0	1777	0	0	1775	0	0	1775	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	56	111	6	50	6	56	94	1	28	639	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	178	0	0	62	0	0	151	0	0	761	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	50	100	5	45	5	50	85	1	25	575	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	56	111	6	50	6	56	94	1	28	639	94
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	988	958	696	1097	1005	105	738			101		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	988	958	696	1097	1005	105	738			101		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	76	74	95	77	99	93			98		
cM capacity (veh/h)	169	231	433	105	217	934	851			1467		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	178	61	151	761
Volume Left	11	6	56	28
Volume Right	111	6	1	94
cSH	316	211	851	1467
Volume to Capacity	0.56	0.29	0.07	0.02
Queue Length 95th (ft)	81	29	5	1
Control Delay (s)	30.1	28.8	3.9	0.5
Lane LOS	D	D	A	A
Approach Delay (s)	30.1	28.8	3.9	0.5
Approach LOS	D	D		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			

APPENDIX B

Year 2035 Background Traffic Peak Hour Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	355	15	1120	325	675	420	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	0.99		1.00	1.00	
Frt		0.980				0.850		0.966			0.990	
Flt Protected		0.965			0.955		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1728	1538	1719	3302	0	1719	3398	0
Flt Permitted		0.717			0.656		0.469			0.090		
Satd. Flow (perm)	0	1263	0	0	1183	1510	846	3302	0	163	3398	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	28	33	100	6	197	17	1244	361	750	467	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	106	197	17	1605	0	750	500	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.85			0.42	0.61	0.04	1.03		2.56	0.23	
Control Delay		60.4			34.2	38.9	12.9	55.5		729.9	6.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		60.4			34.2	38.9	12.9	55.5		729.9	6.5	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Max		Max	Hold	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
70th %ile Term Code	Max	Max		Max	Max	Max	Max	Max		Max	Hold	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
50th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
30th %ile Green (s)	18.9	18.9		18.9	18.9	18.9	39.5	39.5		10.0	54.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
10th %ile Green (s)	13.7	13.7		13.7	13.7	13.7	39.5	39.5		10.0	54.5	
10th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
Queue Length 50th (ft)		116			48	95	5	~496		~644	52	
Queue Length 95th (ft)		#236			97	164	16	#630		#862	74	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		286			268	342	398	1555		293	2208	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.80			0.40	0.58	0.04	1.03		2.56	0.23	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 83.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 85	
50th %ile Actuated Cycle: 85	
30th %ile Actuated Cycle: 84.9	
10th %ile Actuated Cycle: 79.7	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Copy of Analysis\3. 2035 Background\AM.syn Synchro 7 - Report
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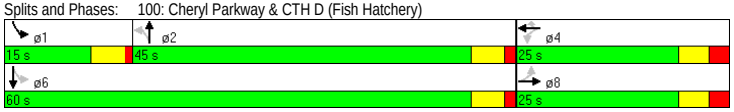
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	355	15	1120	325	675	420	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1721	1509	1714	3303		1719	3399	
Flt Permitted		0.72			0.66	1.00	0.47	1.00		0.09	1.00	
Satd. Flow (perm)		1263			1182	1509	846	3303		163	3399	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	167	28	33	100	6	197	17	1244	361	750	467	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	228	0	0	106	197	17	1605	0	750	500	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		17.9			17.9	17.9	39.5	39.5		54.5	54.5	
Effective Green, g (s)		17.9			17.9	17.9	39.5	39.5		54.5	54.5	
Actuated g/C Ratio		0.21			0.21	0.21	0.47	0.47		0.65	0.65	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		269			252	322	398	1555		291	2208	
v/s Ratio Prot								0.49		c0.31	0.15	
v/s Ratio Perm		c0.18			0.09	0.13	0.02			c1.37		
v/c Ratio		0.85			0.42	0.61	0.04	1.03		2.58	0.23	
Uniform Delay, d1		31.7			28.5	29.9	12.0	22.2		25.9	6.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.6			1.3	3.6	0.1	31.5		719.8	0.1	
Delay (s)		53.3			29.9	33.4	12.0	53.7		745.7	6.1	
Level of Service		D			C	C	B	D		F	A	
Approach Delay (s)		53.3			32.2			53.3			449.8	
Approach LOS		D			C			D			F	

Intersection Summary			
HCM Average Control Delay	197.1	HCM Level of Service	F
HCM Volume to Capacity ratio	2.05		
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	680	70	5	290	30	40	25	20	15	5	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.988			0.968			0.920	
Flt Protected		0.992			0.999			0.977			0.985	
Satd. Flow (prot)	0	1775	0	0	1786	0	0	1711	0	0	1640	0
Flt Permitted		0.992			0.999			0.977			0.985	
Satd. Flow (perm)	0	1775	0	0	1786	0	0	1711	0	0	1640	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	756	78	6	322	33	44	28	22	17	6	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	995	0	0	361	0	0	94	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	680	70	5	290	30	40	25	20	15	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	756	78	6	322	33	44	28	22	17	6	33
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.74			0.74	0.74	0.74	0.74	0.74	
vC, conflicting volume	361			838			1513	1493	804	1513	1516	349
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361			608			1517	1491	562	1517	1521	349
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			99			21	64	94	61	92	95
cM capacity (veh/h)	1177			706			56	77	383	43	73	682

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	994	361	94	56
Volume Left	161	6	44	17
Volume Right	78	33	22	33
cSH	1177	706	78	108
Volume to Capacity	0.14	0.01	1.21	0.52
Queue Length 95th (ft)	12	1	177	59
Control Delay (s)	3.3	0.3	265.1	69.5
Lane LOS	A	A	F	F
Approach Delay (s)	3.3	0.3	265.1	69.5
Approach LOS			F	F

Intersection Summary				
Average Delay	21.4			
Intersection Capacity Utilization	84.2%	ICU Level of Service	E	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	125	5	100	650	190	25	295	370	45	65	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.973			0.928				0.850
Flt Protected		0.985			0.995			0.998			0.980	
Satd. Flow (prot)	0	1782	1538	0	1752	0	0	1676	0	0	1773	1538
Flt Permitted		0.985			0.995			0.998			0.980	
Satd. Flow (perm)	0	1782	1538	0	1752	0	0	1676	0	0	1773	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	61	139	6	111	722	211	28	328	411	50	72	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	6	0	1044	0	0	767	0	0	122	289
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	125	5	100	650	190	25	295	370	45	65	260
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	61	139	6	111	722	211	28	328	411	50	72	289
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1343	977	82	846	1060	543	366			744		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1343	977	82	846	1060	543	366			744		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	39	99	16	0	60	98			94		
cM capacity (veh/h)	0	226	961	132	202	529	1171			847		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	200	6	1044	767	122	289
Volume Left	61	0	111	28	50	0
Volume Right	0	6	211	411	0	289
cSH	0	961	216	1171	847	1700
Volume to Capacity	Err	0.01	4.83	0.02	0.06	0.17
Queue Length 95th (ft)	Err	0	Err	2	5	0
Control Delay (s)	Err	8.8	Err	0.6	4.2	0.0
Lane LOS	F	A	F	A	A	
Approach Delay (s)	Err		Err	0.6	1.3	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	118.1%	ICU Level of Service	H	
Analysis Period (min)	15			

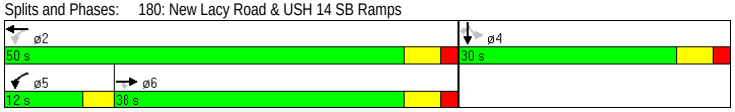
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	920	190	175	580	0	0	0	0	470	1	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.153							0.952	
Satd. Flow (perm)	0	4451	1538	277	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1022	106	194	644	0	0	0	0	522	1	806
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1022	106	194	644	0	0	0	0	0	523	806
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	38.0	38.0	12.0	50.0	0.0	0.0	0.0	0.0	30.0	30.0	30.0
Total Split (%)	0.0%	47.5%	47.5%	15.0%	62.5%	0.0%	0.0%	0.0%	0.0%	37.5%	37.5%	37.5%
Maximum Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.60	0.18	0.65	0.36						0.94	0.92
Control Delay		21.3	16.8	16.4	3.4						55.1	44.8
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		21.3	16.8	16.4	3.4						55.1	44.8
90th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
70th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
50th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
50th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
30th %ile Green (s)		29.8	29.8	7.8	41.1					26.9	26.9	26.9
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		27.5	27.5	6.3	37.3					30.7	30.7	30.7
10th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		157	33	43	36						~265	226
Queue Length 95th (ft)		203	66	0	0						#464	#360
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		1780	615	307	1891						558	877
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.57	0.17	0.63	0.34						0.94	0.92

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 77 (96%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
* User Entered Value	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	920	190	175	580	0	0	0	0	470	1	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.15	1.00						0.95	1.00
Satd. Flow (perm)		4451	1538	276	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1022	106	194	644	0	0	0	0	522	1	806
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1022	106	194	644	0	0	0	0	523	806	
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		30.7	30.7	42.1	42.1						25.9	25.9
Effective Green, g (s)		30.7	30.7	42.1	42.1						25.9	25.9
Actuated g/C Ratio		0.38	0.38	0.53	0.53						0.32	0.32
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		1708	590	288	1809						558	876
v/s Ratio Prot		0.23		c0.07	0.19							
v/s Ratio Perm			0.07	c0.29							0.30	0.30
v/c Ratio		0.60	0.18	0.67	0.36						0.94	0.92
Uniform Delay, d1		19.7	16.3	11.8	11.0						26.3	26.1
Progression Factor		1.00	1.00	0.74	0.27						1.00	1.00
Incremental Delay, d2		1.6	0.7	4.2	0.4						23.1	14.4
Delay (s)		21.3	17.0	12.9	3.5						49.4	40.5
Level of Service		C	B	B	A						D	D
Approach Delay (s)		20.9			5.7			0.0			44.0	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM Average Control Delay	26.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	710	680	0	0	505	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	789	756	0	0	561	244	278	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	789	756	0	0	561	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

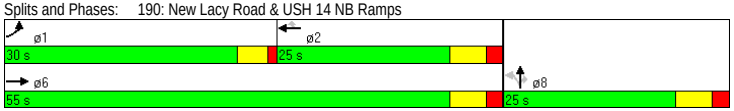
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.84	0.64			0.53	0.51		0.80	0.28			
Control Delay	17.3	7.3			26.5	29.7		47.8	28.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	17.3	7.3			26.5	29.7		47.8	28.2			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.3	49.0			19.2	19.2	19.0	19.0	19.0			
70th %ile Term Code	Gap	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	23.2	50.7			23.0	23.0	17.3	17.3	17.3			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	20.9	53.3			27.9	27.9	14.7	14.7	14.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	17.6	57.2			35.1	35.1	10.8	10.8	10.8			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	188	111			124	103		131	36			
Queue Length 95th (ft)	259	m178			190	#195		#215	73			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1063	1173			1067	477		409	365			
Starvation Cap Reductn	0	15			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.74	0.65			0.53	0.51		0.68	0.24			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	710	680	0	0	505	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	789	756	0	0	561	244	278	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	789	756	0	0	561	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	22.5	51.8			24.8	24.8		16.2	16.2			
Effective Green, g (s)	22.5	51.8			24.8	24.8		16.2	16.2			
Actuated g/C Ratio	0.28	0.65			0.31	0.31		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	938	1172			1066	477		349	311			
v/s Ratio Prot	c0.24	c0.42			0.16							
v/s Ratio Perm						0.16		0.16	0.06			
v/c Ratio	0.84	0.65			0.53	0.51		0.80	0.28			
Uniform Delay, d1	27.1	8.5			22.8	22.6		30.4	26.9			
Progression Factor	0.36	0.60			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.6	1.5			1.9	3.9		11.3	0.2			
Delay (s)	15.3	6.6			24.6	26.5		41.7	27.1			
Level of Service	B	A			C	C		D	C			
Approach Delay (s)		11.0			25.2			38.2			0.0	
Approach LOS		B			C			D			A	

Intersection Summary

HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	355	75	45	185	200	75	830	125	105	265	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99		0.99		0.98	1.00	0.99	
Frt		0.974			0.922				0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1758	0	1719	1651	0	1719	3438	1538	1719	3267	0
Flt Permitted	0.178			0.490			0.511			0.135		
Satd. Flow (perm)	322	1758	0	883	1651	0	920	3438	1511	244	3267	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	411	394	83	50	206	222	83	922	69	117	294	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	477	0	50	428	0	83	922	69	117	411	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	1.02	0.62		0.27	1.23		0.32	0.96	0.16	0.48	0.29	
Control Delay	73.8	24.0		34.6	161.0		30.3	54.7	26.1	22.1	17.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	73.8	24.0		34.6	161.0		30.3	54.7	26.1	22.1	17.2	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	11.1	40.6	
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	9.3	38.8	
70th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	8.1	37.6	
50th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	7.0	36.5	
30th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	5.4	34.9	
10th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	~181	198		23	~298		37	265	29	38	76	
Queue Length 95th (ft)	#389	320		59	#497		81	#413	65	72	110	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	403	768		185	347		256	956	420	357	1649	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	1.02	0.62		0.27	1.23		0.32	0.96	0.16	0.33	0.25	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 88.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 91.1	
70th %ile Actuated Cycle: 89.3	
50th %ile Actuated Cycle: 88.1	
30th %ile Actuated Cycle: 87	
10th %ile Actuated Cycle: 85.4	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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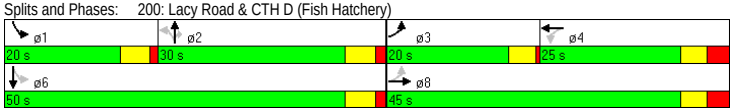
Traffic Analysis & Design, Inc.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	355	75	45	185	200	75	830	125	105	265	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1754		1708	1652		1710	3438	1512	1719	3267	
Flt Permitted	0.18	1.00		0.49	1.00		0.51	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	322	1754		882	1652		920	3438	1512	245	3267	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	411	394	83	50	206	222	83	922	69	117	294	117
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	411	477	0	50	428	0	83	922	69	117	411	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	38.5	38.5		18.5	18.5		24.6	24.6	24.6	37.7	37.7	
Effective Green, g (s)	38.5	38.5		18.5	18.5		24.6	24.6	24.6	37.7	37.7	
Actuated g/C Ratio	0.44	0.44		0.21	0.21		0.28	0.28	0.28	0.43	0.43	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	394	766		185	347		257	959	422	240	1396	
v/s Ratio Prot	c0.19	0.27			c0.26			c0.27		c0.04	0.13	
v/s Ratio Perm	0.27			0.06			0.09		0.05	0.16		
v/c Ratio	1.04	0.62		0.27	1.23		0.32	0.96	0.16	0.49	0.29	
Uniform Delay, d1	23.7	19.2		29.2	34.9		25.2	31.3	24.0	18.9	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	57.0	1.8		1.1	127.6		1.0	20.3	0.2	0.6	0.2	
Delay (s)	80.7	21.0		30.3	162.5		26.2	51.7	24.3	19.4	16.7	
Level of Service	F	C		C	F		C	D	C	B	B	
Approach Delay (s)		48.6			148.6			47.9			17.3	
Approach LOS		D			F			D			B	

Intersection Summary					
HCM Average Control Delay	58.9	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.01				
Actuated Cycle Length (s)	88.2	Sum of lost time (s)		21.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	245	220	190	275	25	135	70	70	10	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.987			0.966			0.966	
Flt Protected		0.982		0.950				0.976			0.988	
Satd. Flow (prot)	0	1777	1538	1719	1786	0	0	1706	0	0	1727	0
Flt Permitted		0.982		0.950				0.976			0.988	
Satd. Flow (perm)	0	1777	1538	1719	1786	0	0	1706	0	0	1727	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	272	244	211	306	28	150	78	78	11	22	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	433	244	211	334	0	0	306	0	0	44	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	245	220	190	275	25	135	70	70	10	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	272	244	211	306	28	150	78	78	11	22	11
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	338			522			1354	1360	282	1463	1591	329
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338			522			1354	1360	282	1463	1591	329
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			79			0	22	90	58	69	98
cM capacity (veh/h)	1199			1025			71	100	743	26	72	699

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	433	244	211	333	306	44
Volume Left	161	0	211	0	150	11
Volume Right	0	244	0	28	78	11
cSH	1199	1700	1025	1700	102	60
Volume to Capacity	0.13	0.14	0.21	0.20	3.00	0.75
Queue Length 95th (ft)	12	0	19	0	734	81
Control Delay (s)	4.0	0.0	9.4	0.0	989.6	162.1
Lane LOS	A		A		F	F
Approach Delay (s)	2.6		3.7		989.6	162.1
Approach LOS					F	F

Intersection Summary				
Average Delay	199.3			
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	215	5	1	345	10	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.873	
Flt Protected			0.950		0.997	
Satd. Flow (prot)	1810	1538	1719	1810	1575	0
Flt Permitted			0.950		0.997	
Satd. Flow (perm)	1810	1538	1719	1810	1575	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	239	6	1	383	11	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	239	6	1	383	189	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	215	5	1	345	10	160
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	239	6	1	383	11	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			244		624	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			244		624	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	78
cM capacity (veh/h)			1304		444	793

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	239	6	1	383	189
Volume Left	0	0	1	0	11
Volume Right	0	6	0	0	178
cSH	1700	1700	1304	1700	758
Volume to Capacity	0.14	0.00	0.00	0.23	0.25
Queue Length 95th (ft)	0	0	0	0	25
Control Delay (s)	0.0	0.0	7.8	0.0	11.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		11.3
Approach LOS					B

Intersection Summary				
Average Delay		2.6		
Intersection Capacity Utilization		35.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	15	320	460	30	25	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.927	
Flt Protected		0.998			0.978	
Satd. Flow (prot)	0	1806	1810	1538	1641	0
Flt Permitted		0.998			0.978	
Satd. Flow (perm)	0	1806	1810	1538	1641	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	17	356	511	33	28	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	373	511	33	61	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	320	460	30	25	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	356	511	33	28	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	544				900	511
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	544				900	511
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	94
cM capacity (veh/h)	1010				300	557

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	372	511	33	61
Volume Left	17	0	0	28
Volume Right	0	0	33	33
cSH	1010	1700	1700	401
Volume to Capacity	0.02	0.30	0.02	0.15
Queue Length 95th (ft)	1	0	0	13
Control Delay (s)	0.6	0.0	0.0	15.6
Lane LOS	A			C
Approach Delay (s)	0.6	0.0		15.6
Approach LOS				C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	155	1	210	370	50	30	450	410	10	70	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.989			0.938			0.929	
Flt Protected		0.973			0.984			0.998			0.997	
Satd. Flow (prot)	0	1761	0	0	1761	0	0	1694	0	0	1676	0
Flt Permitted		0.973			0.984			0.998			0.997	
Satd. Flow (perm)	0	1761	0	0	1761	0	0	1694	0	0	1676	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	211	172	1	233	411	56	33	500	456	11	78	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	384	0	0	700	0	0	989	0	0	189	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	190	155	1	210	370	50	30	450	410	10	70	90
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	172	1	233	411	56	33	500	456	11	78	100
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1216	1182	138	1042	1004	738	183			961		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1216	1182	138	1042	1004	738	183			961		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	3	100	0	0	86	98			98		
cM capacity (veh/h)	0	178	895	24	227	410	1369			701		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	384	700	989	189
Volume Left	211	233	33	11
Volume Right	1	56	456	100
cSH	0	60	1369	701
Volume to Capacity	Err	11.71	0.02	0.02
Queue Length 95th (ft)	Err	Err	2	1
Control Delay (s)	Err	Err	0.7	0.8
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	0.7	0.8
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	255	320	360	30	25	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1791	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1791	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	283	356	400	33	28	300
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	356	433	0	28	300
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	255	320	360	30	25	270
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	283	356	400	33	28	300
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	438				1349	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438				1349	427
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	74				77	51
cM capacity (veh/h)	1101				121	616

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	283	356	433	28	300
Volume Left	283	0	0	28	0
Volume Right	0	0	33	0	300
cSH	1101	1700	1700	121	616
Volume to Capacity	0.26	0.21	0.25	0.23	0.49
Queue Length 95th (ft)	26	0	0	21	67
Control Delay (s)	9.4	0.0	0.0	43.6	16.3
Lane LOS	A			E	C
Approach Delay (s)	4.2		0.0	18.6	
Approach LOS				C	

Intersection Summary				
Average Delay		6.2		
Intersection Capacity Utilization		49.8%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	15	10	30	10	1140	70	145	265	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.960			0.971		0.950			0.950		
Satd. Flow (prot)	0	1737	1538	0	1757	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.960			0.971		0.950			0.950		
Satd. Flow (perm)	0	1737	1538	0	1757	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	17	17	11	33	11	1267	78	161	294	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	17	0	28	33	11	1267	78	161	294	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	10	15	15	10	30	10	1140	70	145	265	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	11	17	17	11	33	11	1267	78	161	294	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1954	1993	304	1938	1938	1277	322			1349		
vC1, stage 1 conf vol	622	622		1294	1294							
vC2, stage 2 conf vol	1333	1372		644	644							
vCu, unblocked vol	1954	1993	304	1938	1938	1277	322			1349		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	76	98	89	94	83	99			68		
cM capacity (veh/h)	28	46	722	156	180	199	1216			499		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	67	17	28	33	11	1267	78	161	294	22
Volume Left	56	0	17	0	11	0	0	161	0	0
Volume Right	0	17	0	33	0	0	78	0	0	22
cSH	29	722	165	199	1216	1700	1700	499	1700	1700
Volume to Capacity	2.26	0.02	0.17	0.17	0.01	0.75	0.05	0.32	0.17	0.01
Queue Length 95th (ft)	196	2	15	15	1	0	0	35	0	0
Control Delay (s)	863.1	10.1	31.2	26.7	8.0	0.0	0.0	15.6	0.0	0.0
Lane LOS	F	B	D	D	A			C		
Approach Delay (s)	692.5		28.8		0.1			5.3		
Approach LOS	F		D							

Intersection Summary					
Average Delay		31.4			
Intersection Capacity Utilization		88.5%	ICU Level of Service		E
Analysis Period (min)		15			

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Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	95	45	15	15	1	15	1	30	15	15	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.952			0.992			0.913			0.955	
Flt Protected	0.950			0.950				0.984			0.984	
Satd. Flow (prot)	1719	1723	0	1719	1795	0	0	1626	0	0	1700	0
Flt Permitted	0.950			0.950				0.984			0.984	
Satd. Flow (perm)	1719	1723	0	1719	1795	0	0	1626	0	0	1700	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	67	106	50	17	17	1	17	1	33	17	17	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	156	0	17	18	0	0	51	0	0	51	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	95	45	15	15	1	15	1	30	15	15	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	67	106	50	17	17	1	17	1	33	17	17	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	23			161			349	325	141	333	349	27
vC1, stage 1 conf vol							269	269		56	56	
vC2, stage 2 conf vol							80	56		278	294	
vCu, unblocked vol	23			161			349	325	141	333	349	27
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			97	100	96	97	97	98
cM capacity (veh/h)	1567			1395			654	622	892	626	597	1031

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	67	156	17	18	51	50
Volume Left	67	0	17	0	17	17
Volume Right	0	50	0	1	33	17
cSH	1567	1700	1395	1700	791	707
Volume to Capacity	0.04	0.09	0.01	0.01	0.06	0.07
Queue Length 95th (ft)	3	0	1	0	5	6
Control Delay (s)	7.4	0.0	7.6	0.0	9.9	10.5
Lane LOS	A		A		A	B
Approach Delay (s)	2.2		3.7		9.9	10.5
Approach LOS					A	B

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	24.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	215	780	70	60	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	33	239	867	78	67	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	239	867	78	67	189
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	215	780	70	60	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	239	867	78	67	189
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1199	877			949	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1199	877			949	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	30			91	
cM capacity (veh/h)	181	341			708	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	239	867	78	67	189
Volume Left	33	0	0	0	67	0
Volume Right	0	239	0	78	0	0
cSH	181	341	1700	1700	708	1700
Volume to Capacity	0.18	0.70	0.51	0.05	0.09	0.11
Queue Length 95th (ft)	16	126	0	0	8	0
Control Delay (s)	29.3	37.0	0.0	0.0	10.6	0.0
Lane LOS	D	E			B	
Approach Delay (s)	36.0		0.0		2.8	
Approach LOS	E					

Intersection Summary				
Average Delay		7.1		
Intersection Capacity Utilization		61.6%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	170	1	1	200	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.918	
Flt Protected					0.981	
Satd. Flow (prot)	1808	0	0	1810	1630	0
Flt Permitted					0.981	
Satd. Flow (perm)	1808	0	0	1810	1630	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	189	1	1	222	11	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	0	223	28	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	170	1	1	200	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	189	1	1	222	11	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			190		414	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		414	189
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	98
cM capacity (veh/h)			1366		589	845

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	223	28
Volume Left	0	1	11
Volume Right	1	0	17
cSH	1700	1366	719
Volume to Capacity	0.11	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.2
Approach LOS			B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		21.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	50	35	10	65	25	95	765	1	10	230	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.974			0.966						0.981	
Flt Protected		0.974			0.995			0.994			0.998	
Satd. Flow (prot)	0	1717	0	0	1739	0	0	1799	0	0	1772	0
Flt Permitted		0.974			0.995			0.994			0.998	
Satd. Flow (perm)	0	1717	0	0	1739	0	0	1799	0	0	1772	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	111	56	39	11	72	28	106	850	1	11	256	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	206	0	0	111	0	0	957	0	0	311	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	50	35	10	65	25	95	765	1	10	230	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	111	56	39	11	72	28	106	850	1	11	256	44
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1436	1372	288	1438	1394	861	305			856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1436	1372	288	1438	1394	861	305			856		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	57	95	82	42	92	91			99		
cM capacity (veh/h)	50	128	738	63	125	348	1234			768		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	206	111	957	311
Volume Left	111	11	106	11
Volume Right	39	28	1	44
cSH	76	133	1234	768
Volume to Capacity	2.70	0.84	0.09	0.01
Queue Length 95th (ft)	501	131	7	1
Control Delay (s)	887.6	102.7	2.2	0.5
Lane LOS	F	F	A	A
Approach Delay (s)	887.6	102.7	2.2	0.5
Approach LOS	F	F		

Intersection Summary				
Average Delay	123.7			
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	860	10	545	20	430	1175	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99	0.98	1.00	1.00		1.00	1.00	
Frt		0.967				0.850		0.995			0.987	
Flt Protected		0.969			0.958		0.950			0.950		
Satd. Flow (prot)	0	1688	0	0	1734	1538	1719	3418	0	1719	3386	0
Flt Permitted		0.642			0.690		0.175			0.276		
Satd. Flow (perm)	0	1115	0	0	1242	1510	316	3418	0	499	3386	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	22	239	33	478	11	606	22	478	1306	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	0	0	272	478	11	628	0	478	1428	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.29			0.80	1.16	0.10	0.53		1.04	0.75	
Control Delay		26.7			46.9	124.4	16.3	19.5		68.0	14.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		26.7			46.9	124.4	16.3	19.5		68.0	14.3	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Hold	Hold		Max	Max	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	28.5	28.5		10.0	43.5	
70th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	23.5	23.5		10.0	38.5	
50th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
30th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	18.0	18.0		10.0	33.0	
30th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
10th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	16.0	16.0		10.0	31.0	
10th %ile Term Code	Hold	Hold		Max	Max	Max	Min	Min		Max	Hold	
Queue Length 50th (ft)		30			106	~244	3	111		~121	221	
Queue Length 95th (ft)		84			#299	#532	13	152		#302	287	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		304			339	412	179	1938		459	2649	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.29			0.80	1.16	0.06	0.32		1.04	0.54	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 70.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 74	
50th %ile Actuated Cycle: 69	
30th %ile Actuated Cycle: 63.5	
10th %ile Actuated Cycle: 61.5	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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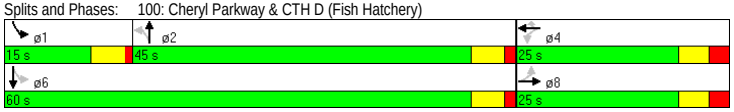
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	860	10	545	20	430	1175	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1685			1726	1511	1717	3417		1718	3387	
Flt Permitted		0.64			0.69	1.00	0.18	1.00		0.28	1.00	
Satd. Flow (perm)		1116			1243	1511	317	3417		500	3387	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	56	11	22	239	33	478	11	606	22	478	1306	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	89	0	0	272	478	11	628	0	478	1428	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		19.3			19.3	19.3	24.6	24.6		39.7	39.7	
Effective Green, g (s)		19.3			19.3	19.3	24.6	24.6		39.7	39.7	
Actuated g/C Ratio		0.27			0.27	0.27	0.35	0.35		0.56	0.56	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		306			340	414	111	1192		456	1907	
v/s Ratio Prot								0.18		c0.15	0.42	
v/s Ratio Perm		0.08			0.22	c0.32	0.03			c0.44		
v/c Ratio		0.29			0.80	1.15	0.10	0.53		1.05	0.75	
Uniform Delay, d1		20.2			23.8	25.6	15.5	18.3		12.0	11.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			13.0	93.7	0.5	0.6		55.4	1.8	
Delay (s)		20.8			36.8	119.3	16.0	18.9		67.3	13.4	
Level of Service		C			D	F	B	B		E	B	
Approach Delay (s)		20.8			89.4			18.8			26.9	
Approach LOS		C			F			B			C	

Intersection Summary					
HCM Average Control Delay	39.1	HCM Level of Service		D	
HCM Volume to Capacity ratio	1.04				
Actuated Cycle Length (s)	70.5	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	81.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	415	35	25	800	15	160	10	15	65	30	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.998			0.989			0.908	
Flt Protected		0.991			0.999			0.959			0.989	
Satd. Flow (prot)	0	1777	0	0	1804	0	0	1716	0	0	1625	0
Flt Permitted		0.991			0.999			0.959			0.989	
Satd. Flow (perm)	0	1777	0	0	1804	0	0	1716	0	0	1625	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	461	39	28	889	17	178	11	17	72	33	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	617	0	0	934	0	0	206	0	0	333	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	415	35	25	800	15	160	10	15	65	30	205
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	461	39	28	889	17	178	11	17	72	33	228
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	911			505			1921	1685	491	1699	1696	907
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	911			317			2001	1720	300	1736	1733	907
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			97			0	81	97	0	43	30
cM capacity (veh/h)	733			1027			5	60	611	40	59	327

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	617	933	206	333
Volume Left	117	28	178	72
Volume Right	39	17	17	228
cSH	733	1027	6	109
Volume to Capacity	0.16	0.03	33.66	3.05
Queue Length 95th (ft)	14	2	Err	Err
Control Delay (s)	4.0	0.7	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	4.0	0.7	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	2581.1		
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	635	25	465	130	55	5	85	100	210	315	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.989			0.929				0.850
Flt Protected		0.985			0.965			0.999			0.980	
Satd. Flow (prot)	0	1782	1538	0	1727	0	0	1679	0	0	1773	1538
Flt Permitted		0.985			0.965			0.999			0.980	
Satd. Flow (perm)	0	1782	1538	0	1727	0	0	1679	0	0	1773	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	311	706	28	517	144	61	6	94	111	233	350	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1017	28	0	722	0	0	211	0	0	583	56
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	280	635	25	465	130	55	5	85	100	210	315	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	311	706	28	517	144	61	6	94	111	233	350	56
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1121	1043	360	1368	1043	160	411			211		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1121	1043	360	1368	1043	160	411			211		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	96	0	22	93	100			83		
cM capacity (veh/h)	52	184	672	0	184	870	1128			1337		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	1017	28	722	211	583	56
Volume Left	311	0	517	6	233	0
Volume Right	0	28	61	111	0	56
cSH	104	672	0	1128	1337	1700
Volume to Capacity	9.81	0.04	Err	0.00	0.17	0.03
Queue Length 95th (ft)	Err	3	Err	0	16	0
Control Delay (s)	Err	10.6	Err	0.3	4.4	0.0
Lane LOS	F	B	F	A	A	
Approach Delay (s)	9733.4		Err	0.3	4.0	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	137.9%	ICU Level of Service	H	
Analysis Period (min)	15			

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

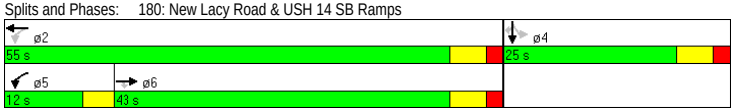
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	250	120	385	0	0	0	0	315	1	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	0	1724	2707
Flt Permitted				0.104							0.953	
Satd. Flow (perm)	0	4451	1538	188	3438	0	0	0	0	0	1724	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1350	139	133	428	0	0	0	0	350	1	539
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1350	139	133	428	0	0	0	0	0	351	539
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.62	0.18	0.52	0.20						0.90	0.88
Control Delay		16.8	12.9	8.9	1.1						57.1	46.6
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		16.8	12.9	8.9	1.1						57.1	46.6
90th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		37.8	37.8	7.7	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		38.7	38.7	6.8	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		39.4	39.4	6.1	49.0					19.0	19.0	19.0
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		43.5	43.5	6.0	53.0					15.0	15.0	15.0
10th %ile Term Code		Coord	Coord	Min	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		193	37	0	0						168	146
Queue Length 95th (ft)		255	74	13	0						#314	#236
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2185	755	286	2140						409	643
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.62	0.18	0.47	0.20						0.86	0.84

Intersection Summary
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	250	120	385	0	0	0	0	315	1	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.10	1.00						0.95	1.00
Satd. Flow (perm)		4451	1538	189	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1350	139	133	428	0	0	0	0	350	1	539
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1350	139	133	428	0	0	0	0	0	351	539
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		39.3	39.3	49.8	49.8						18.2	18.2
Effective Green, g (s)		39.3	39.3	49.8	49.8						18.2	18.2
Actuated g/C Ratio		0.49	0.49	0.62	0.62						0.23	0.23
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2187	756	252	2140						392	616
v/s Ratio Prot		c0.30		c0.05	0.12							
v/s Ratio Perm			0.09	0.28							0.20	0.20
v/c Ratio		0.62	0.18	0.53	0.20						0.90	0.88
Uniform Delay, d1		14.9	11.4	8.9	6.5						30.0	29.8
Progression Factor		1.00	1.00	0.29	0.14						1.00	1.00
Incremental Delay, d2		1.3	0.5	0.9	0.2						21.6	12.8
Delay (s)		16.2	11.9	3.4	1.1						51.6	42.6
Level of Service		B	B	A	A						D	D
Approach Delay (s)		15.8			1.6			0.0			46.1	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	22.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

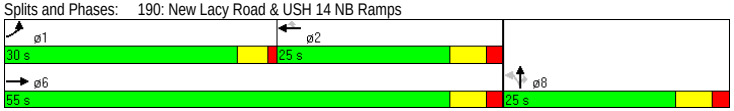
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	940	590	0	0	340	295	165	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1044	656	0	0	378	164	183	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1044	656	0	0	378	164	0	184	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.53			0.41	0.40		0.64	0.33			
Control Delay	18.5	4.0			26.6	28.8		41.0	31.9			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	18.5	4.0			26.6	28.8		41.0	31.9			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	31.6	55.1			19.0	19.0	12.9	12.9	12.9			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	29.5	57.3			23.3	23.3	10.7	10.7	10.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	27.1	58.0			26.4	26.4	10.0	10.0	10.0			
10th %ile Term Code	Gap	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	231	33			85	70		87	39			
Queue Length 95th (ft)	#394	m106			127	128		142	74			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1201	1236			917	410		409	365			
Starvation Cap Reductn	0	24			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.87	0.54			0.41	0.40		0.45	0.24			

Intersection Summary
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 55 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	940	590	0	0	340	295	165	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1044	656	0	0	378	164	183	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1044	656	0	0	378	164	0	184	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	28.8	54.6			21.3	21.3		13.4	13.4			
Effective Green, g (s)	28.8	54.6			21.3	21.3		13.4	13.4			
Actuated g/C Ratio	0.36	0.68			0.27	0.27		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1201	1235			915	409		289	258			
v/s Ratio Prot	c0.31	c0.36			0.11							
v/s Ratio Perm						0.11		0.11	0.06			
v/c Ratio	0.87	0.53			0.41	0.40		0.64	0.33			
Uniform Delay, d1	23.8	6.3			24.2	24.1		31.0	29.4			
Progression Factor	0.40	0.41			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.4	1.1			1.4	2.9		3.4	0.3			
Delay (s)	14.8	3.6			25.6	27.0		34.4	29.6			
Level of Service	B	A			C	C		C	C			
Approach Delay (s)		10.5			26.0			32.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	210	120	175	455	140	115	340	70	260	860	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	1.00		1.00		0.98	1.00	0.99	
Frt		0.945			0.965				0.850		0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1700	0	1719	1738	0	1719	3438	1538	1719	3278	0
Flt Permitted	0.177			0.543			0.176			0.402		
Satd. Flow (perm)	320	1700	0	978	1738	0	318	3438	1511	726	3278	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	233	133	194	506	156	128	378	39	289	956	350
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	366	0	194	662	0	128	378	39	289	1306	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.51	0.58		0.92	1.77		1.39	0.38	0.09	0.57	0.81	
Control Delay	24.1	26.6		81.2	379.8		260.9	26.7	25.0	18.4	23.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	24.1	26.6		81.2	379.8		260.9	26.7	25.0	18.4	23.8	
90th %ile Green (s)	12.9	35.4		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
70th %ile Green (s)	10.6	33.1		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
70th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
50th %ile Green (s)	9.1	31.6		18.5	18.5		25.5	25.5	25.5	13.2	43.7	
50th %ile Term Code	Gap	Hold		Max	Max		Hold	Hold	Hold	Gap	Gap	
30th %ile Green (s)	7.6	30.1		18.5	18.5		24.5	24.5	24.5	11.0	40.5	
30th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	5.8	28.3		18.5	18.5		24.5	24.5	24.5	8.4	37.9	
10th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	50	161		106	~553		~94	86	16	90	298	
Queue Length 95th (ft)	90	254		#250	#805		#217	137	42	157	423	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	389	764		211	375		92	992	436	535	1703	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.36	0.48		0.92	1.77		1.39	0.38	0.09	0.54	0.77	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 85.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 91.9	
70th %ile Actuated Cycle: 89.6	
50th %ile Actuated Cycle: 87.3	
30th %ile Actuated Cycle: 82.6	
10th %ile Actuated Cycle: 78.2	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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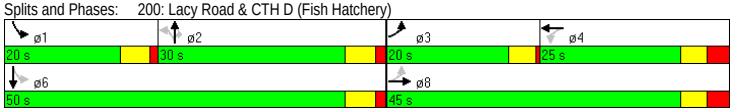
Traffic Analysis & Design, Inc.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	210	120	175	455	140	115	340	70	260	860	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1694		1707	1738		1717	3438	1512	1718	3278	
Flt Permitted	0.18	1.00		0.54	1.00		0.18	1.00	1.00	0.40	1.00	
Satd. Flow (perm)	320	1694		976	1738		318	3438	1512	727	3278	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	139	233	133	194	506	156	128	378	39	289	956	350
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	139	366	0	194	662	0	128	378	39	289	1306	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	31.7	31.7		18.6	18.6		24.8	24.8	24.8	42.2	42.2	
Effective Green, g (s)	31.7	31.7		18.6	18.6		24.8	24.8	24.8	42.2	42.2	
Actuated g/C Ratio	0.37	0.37		0.22	0.22		0.29	0.29	0.29	0.49	0.49	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	266	625		211	376		92	993	437	500	1610	
v/s Ratio Prot	0.06	c0.22			c0.38			0.11		0.08	c0.40	
v/s Ratio Perm	0.14			0.20			c0.40		0.03	0.20		
v/c Ratio	0.52	0.59		0.92	1.76		1.39	0.38	0.09	0.58	0.81	
Uniform Delay, d1	20.8	21.8		32.9	33.7		30.6	24.4	22.3	13.8	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	1.7		40.3	353.0		229.5	0.3	0.1	1.0	3.4	
Delay (s)	21.6	23.5		73.2	386.7		260.0	24.7	22.4	14.8	21.9	
Level of Service	C	C		E	F		F	C	C	B	C	
Approach Delay (s)		23.0			315.6			79.8			20.6	
Approach LOS		C			F			E			C	

Intersection Summary					
HCM Average Control Delay	102.3	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.38				
Actuated Cycle Length (s)	85.9	Sum of lost time (s)		24.0	
Intersection Capacity Utilization	104.7%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	295	170	50	375	10	220	35	165	20	35	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.996			0.947			0.897	
Flt Protected		0.993		0.950				0.974			0.996	
Satd. Flow (prot)	0	1797	1538	1719	1802	0	0	1669	0	0	1617	0
Flt Permitted		0.993		0.950				0.974			0.996	
Satd. Flow (perm)	0	1797	1538	1719	1802	0	0	1669	0	0	1617	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	328	189	56	417	11	244	39	183	22	39	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	384	189	56	428	0	0	466	0	0	255	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	295	170	50	375	10	220	35	165	20	35	175
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	328	189	56	417	11	244	39	183	22	39	194
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	433			522			1191	988	338	1185	1171	432
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			522			1191	988	338	1185	1171	432
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			95			0	82	73	76	77	68
cM capacity (veh/h)	1106			1025			83	218	692	94	169	612

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	383	189	56	428	467	256
Volume Left	56	0	56	0	244	22
Volume Right	0	189	0	11	183	194
cSH	1106	1700	1025	1700	138	327
Volume to Capacity	0.05	0.11	0.05	0.25	3.39	0.78
Queue Length 95th (ft)	4	0	4	0	Err	158
Control Delay (s)	1.7	0.0	8.7	0.0	Err	46.3
Lane LOS	A		A		F	E
Approach Delay (s)	1.1		1.0		Err	46.3
Approach LOS					F	E

Intersection Summary				
Average Delay	2632.0			
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	340	15	210	325	5	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.875	
Flt Protected			0.950		0.996	
Satd. Flow (prot)	1810	1538	1719	1810	1577	0
Flt Permitted			0.950		0.996	
Satd. Flow (perm)	1810	1538	1719	1810	1577	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	378	17	233	361	6	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	378	17	233	361	78	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	15	210	325	5	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	378	17	233	361	6	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			394		1206	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			394		1206	378
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		97	89
cM capacity (veh/h)			1148		159	662

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	378	17	233	361	78
Volume Left	0	0	233	0	6
Volume Right	0	17	0	0	72
cSH	1700	1700	1148	1700	541
Volume to Capacity	0.22	0.01	0.20	0.21	0.14
Queue Length 95th (ft)	0	0	19	0	12
Control Delay (s)	0.0	0.0	8.9	0.0	12.8
Lane LOS			A		B
Approach Delay (s)	0.0		3.5		12.8
Approach LOS					B

Intersection Summary				
Average Delay		2.9		
Intersection Capacity Utilization		43.8%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	20	480	450	30	35	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.938	
Flt Protected		0.998			0.974	
Satd. Flow (prot)	0	1806	1810	1538	1653	0
Flt Permitted		0.998			0.974	
Satd. Flow (perm)	0	1806	1810	1538	1653	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	22	533	500	33	39	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	555	500	33	72	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	480	450	30	35	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	533	500	33	39	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	533				1078	500
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	533				1078	500
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				83	94
cM capacity (veh/h)	1019				234	565

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	556	500	33	72
Volume Left	22	0	0	39
Volume Right	0	0	33	33
cSH	1019	1700	1700	320
Volume to Capacity	0.02	0.29	0.02	0.23
Queue Length 95th (ft)	2	0	0	21
Control Delay (s)	0.6	0.0	0.0	19.5
Lane LOS	A			C
Approach Delay (s)	0.6	0.0		19.5
Approach LOS				C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	390	50	210	165	25	30	90	1	65	455	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.991			0.999			0.952	
Flt Protected		0.993			0.974			0.988			0.996	
Satd. Flow (prot)	0	1773	0	0	1747	0	0	1786	0	0	1716	0
Flt Permitted		0.993			0.974			0.988			0.996	
Satd. Flow (perm)	0	1773	0	0	1747	0	0	1786	0	0	1716	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	433	56	233	183	28	33	100	1	72	506	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	572	0	0	444	0	0	134	0	0	895	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	390	50	210	165	25	30	90	1	65	455	285
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	433	56	233	183	28	33	100	1	72	506	317
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1105	986	674	1258	1144	111	827			106		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1105	986	674	1258	1144	111	827			106		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	88	0	0	97	96			95		
cM capacity (veh/h)	0	221	446	0	178	927	788			1460		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	572	444	134	894
Volume Left	83	233	33	72
Volume Right	56	28	1	317
cSH	0	0	788	1460
Volume to Capacity	Err	Err	0.04	0.05
Queue Length 95th (ft)	Err	Err	3	4
Control Delay (s)	Err	Err	2.8	1.3
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	2.8	1.3
Approach LOS	F	F		

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	108.3%	ICU Level of Service	G	
Analysis Period (min)	15			

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	205	250	230	20	15	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1790	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1790	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	228	278	256	22	17	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	278	278	0	17	189
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	205	250	230	20	15	170
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	228	278	256	22	17	189
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				1010	277
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				1010	277
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				92	75
cM capacity (veh/h)	1257				213	749

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	228	278	278	17	189
Volume Left	228	0	0	17	0
Volume Right	0	0	22	0	189
cSH	1257	1700	1700	213	749
Volume to Capacity	0.18	0.16	0.16	0.08	0.25
Queue Length 95th (ft)	17	0	0	6	25
Control Delay (s)	8.5	0.0	0.0	23.3	11.4
Lane LOS	A			C	B
Approach Delay (s)	3.8		0.0	12.4	
Approach LOS				B	

Intersection Summary				
Average Delay		4.5		
Intersection Capacity Utilization		39.6%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	10	75	10	145	10	410	25	30	1265	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.958		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1734	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.954			0.958		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1734	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	11	83	11	161	11	456	28	33	1406	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	11	0	94	161	11	456	28	33	1406	56
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	10	75	10	145	10	410	25	30	1265	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	11	83	11	161	11	456	28	33	1406	56
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2127	1988	1416	1972	2016	466	1466			488		
vC1, stage 1 conf vol	1477	1477		483	483							
vC2, stage 2 conf vol	649	511		1489	1533							
vCu, unblocked vol	2127	1988	1416	1972	2016	466	1466			488		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	99	93	31	93	73	98			97		
cM capacity (veh/h)	128	169	164	120	151	586	450			1055		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	23	11	94	161	11	456	28	33	1406	56
Volume Left	22	0	83	0	11	0	0	33	0	0
Volume Right	0	11	0	161	0	0	28	0	0	56
cSH	130	164	123	586	450	1700	1700	1055	1700	1700
Volume to Capacity	0.18	0.07	0.77	0.27	0.02	0.27	0.02	0.03	0.83	0.03
Queue Length 95th (ft)	16	5	111	28	2	0	0	2	0	0
Control Delay (s)	38.7	28.5	95.6	13.5	13.2	0.0	0.0	8.5	0.0	0.0
Lane LOS	E	D	F	B	B			A		
Approach Delay (s)	35.4		43.8		0.3			0.2		
Approach LOS	E		E							

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	87.5%	ICU Level of Service	E	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	15	1	1	185	15	15	1	1	15	1	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.989			0.993			0.890	
Flt Protected	0.950			0.950				0.957			0.991	
Satd. Flow (prot)	1719	1795	0	1719	1790	0	0	1720	0	0	1596	0
Flt Permitted	0.950			0.950				0.957			0.991	
Satd. Flow (perm)	1719	1795	0	1719	1790	0	0	1720	0	0	1596	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	33	17	1	1	206	17	17	1	1	17	1	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	18	0	1	223	0	0	19	0	0	96	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	15	1	1	185	15	15	1	1	15	1	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	17	1	1	206	17	17	1	1	17	1	78
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			23			380	318	27	311	311	224
vC1, stage 1 conf vol							89	89		221	221	
vC2, stage 2 conf vol							291	229		90	89	
vCu, unblocked vol	227			23			380	318	27	311	311	224
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			97	100	100	98	100	90
cM capacity (veh/h)	1318			1567			584	644	1031	725	669	801

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	18	1	222	19	96
Volume Left	33	0	1	0	17	17
Volume Right	0	1	0	17	1	78
cSH	1318	1700	1567	1700	603	785
Volume to Capacity	0.03	0.01	0.00	0.13	0.03	0.12
Queue Length 95th (ft)	2	0	0	0	2	10
Control Delay (s)	7.8	0.0	7.3	0.0	11.2	10.2
Lane LOS	A		A		B	B
Approach Delay (s)	5.1		0.0		11.2	10.2
Approach LOS					B	B

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	31.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	75	85	270	25	215	855
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	83	94	300	28	239	950
Shared Lane Traffic (%)						
Lane Group Flow (vph)	83	94	300	28	239	950
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	85	270	25	215	855
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	94	300	28	239	950
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1738	310			333	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1738	310			333	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			80	
cM capacity (veh/h)	75	717			1205	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	83	94	300	28	239	950
Volume Left	83	0	0	0	239	0
Volume Right	0	94	0	28	0	0
cSH	75	717	1700	1700	1205	1700
Volume to Capacity	1.11	0.13	0.18	0.02	0.20	0.56
Queue Length 95th (ft)	153	11	0	0	18	0
Control Delay (s)	235.3	10.8	0.0	0.0	8.7	0.0
Lane LOS	F	B			A	
Approach Delay (s)	116.0		0.0		1.8	
Approach LOS	F					

Intersection Summary				
Average Delay		13.4		
Intersection Capacity Utilization		57.2%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	175	10	25	170	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.993				0.876	
Flt Protected				0.994	0.996	
Satd. Flow (prot)	1797	0	0	1799	1579	0
Flt Permitted				0.994	0.996	
Satd. Flow (perm)	1797	0	0	1799	1579	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	194	11	28	189	1	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	205	0	0	217	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	175	10	25	170	1	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	194	11	28	189	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			206		444	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			206		444	200
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1348		554	833

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	206	217	12
Volume Left	0	28	1
Volume Right	11	0	11
cSH	1700	1348	797
Volume to Capacity	0.12	0.02	0.02
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	1.1	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	1.1	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		33.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	60	110	10	50	1	45	105	1	25	590	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.998			0.999			0.981	
Flt Protected		0.996			0.992			0.985			0.998	
Satd. Flow (prot)	0	1658	0	0	1791	0	0	1781	0	0	1772	0
Flt Permitted		0.996			0.992			0.985			0.998	
Satd. Flow (perm)	0	1658	0	0	1791	0	0	1781	0	0	1772	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	67	122	11	56	1	50	117	1	28	656	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	206	0	0	68	0	0	168	0	0	795	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	60	110	10	50	1	45	105	1	25	590	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	67	122	11	56	1	50	117	1	28	656	111
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1023	994	721	1149	1049	127	772			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1023	994	721	1149	1049	127	772			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	70	71	87	73	100	94			98		
cM capacity (veh/h)	155	221	419	87	205	907	827			1440		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	206	68	168	794
Volume Left	17	11	50	28
Volume Right	122	1	1	111
cSH	293	170	827	1440
Volume to Capacity	0.70	0.40	0.06	0.02
Queue Length 95th (ft)	122	44	5	1
Control Delay (s)	41.6	39.6	3.3	0.5
Lane LOS	E	E	A	A
Approach Delay (s)	41.6	39.6	3.3	0.5
Approach LOS	E	E		

Intersection Summary				
Average Delay	9.9			
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			

APPENDIX C

BUILD TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS

APPENDIX C

Year 2025 Build Traffic Peak Hour Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	275	15	1225	270	575	725	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.981				0.850		0.973			0.995	
Flt Protected		0.964			0.955		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1728	1538	1719	3330	0	1719	3418	0
Flt Permitted		0.714			0.665		0.338			0.090		
Satd. Flow (perm)	0	1259	0	0	1198	1510	611	3330	0	163	3418	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	22	28	100	6	153	17	1361	300	639	806	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	106	153	17	1661	0	639	834	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.77			0.44	0.50	0.06	1.04		2.15	0.37	
Control Delay		52.2			35.0	35.5	13.3	58.3		547.2	7.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		52.2			35.0	35.5	13.3	58.3		547.2	7.2	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Max		Max	Hold	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
70th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
50th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
30th %ile Green (s)	15.5	15.5		15.5	15.5	15.5	39.5	39.5		10.0	54.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
10th %ile Green (s)	11.0	11.0		11.0	11.0	11.0	39.5	39.5		10.0	54.5	
10th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
Queue Length 50th (ft)		96			48	71	5	~525		~516	98	
Queue Length 95th (ft)		#190			97	129	17	#659		#723	132	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		290			276	348	292	1593		297	2256	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.67			0.38	0.44	0.06	1.04		2.15	0.37	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 82.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 85	
50th %ile Actuated Cycle: 85	
30th %ile Actuated Cycle: 81.5	
10th %ile Actuated Cycle: 77	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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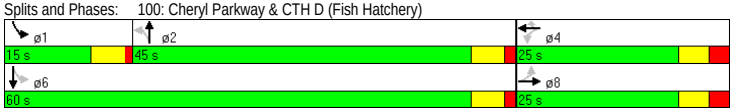
Traffic Analysis & Design, Inc.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	275	15	1225	270	575	725	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1698			1720	1508	1716	3330		1719	3418	
Flt Permitted		0.71			0.67	1.00	0.34	1.00		0.09	1.00	
Satd. Flow (perm)		1257			1198	1508	610	3330		162	3418	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	144	22	28	100	6	153	17	1361	300	639	806	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	194	0	0	106	153	17	1661	0	639	834	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		16.6			16.6	16.6	39.6	39.6		54.6	54.6	
Effective Green, g (s)		16.6			16.6	16.6	39.6	39.6		54.6	54.6	
Actuated g/C Ratio		0.20			0.20	0.20	0.48	0.48		0.66	0.66	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		252			240	303	292	1595		295	2257	
v/s Ratio Prot								0.50		c0.26	0.24	
v/s Ratio Perm		c0.15			0.09	0.10	0.03			c1.17		
v/c Ratio		0.77			0.44	0.50	0.06	1.04		2.17	0.37	
Uniform Delay, d1		31.2			29.0	29.4	11.6	21.6		25.9	6.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.6			1.5	1.6	0.1	34.1		535.8	0.1	
Delay (s)		44.8			30.5	31.0	11.7	55.7		561.7	6.5	
Level of Service		D			C	C	B	E		F	A	
Approach Delay (s)		44.8			30.8			55.2			247.3	
Approach LOS		D			C			E			F	

Intersection Summary					
HCM Average Control Delay	131.4	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.76				
Actuated Cycle Length (s)	82.7	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	104.7%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	615	15	5	265	25	10	15	10	15	5	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.988			0.962			0.926	
Flt Protected		0.992			0.999			0.986			0.984	
Satd. Flow (prot)	0	1790	0	0	1786	0	0	1716	0	0	1649	0
Flt Permitted		0.992			0.999			0.986			0.984	
Satd. Flow (perm)	0	1790	0	0	1786	0	0	1716	0	0	1649	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	683	17	6	294	28	11	17	11	17	6	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	839	0	0	328	0	0	39	0	0	51	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	615	15	5	265	25	10	15	10	15	5	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	139	683	17	6	294	28	11	17	11	17	6	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	327			705			1329	1313	702	1318	1307	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	327			533			1293	1272	529	1279	1266	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			99			88	86	97	82	95	96
cM capacity (veh/h)	1211			835			94	119	443	90	120	709

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	839	328	39	50
Volume Left	139	6	11	17
Volume Right	17	28	11	28
cSH	1211	835	137	185
Volume to Capacity	0.11	0.01	0.28	0.27
Queue Length 95th (ft)	10	1	27	26
Control Delay (s)	2.7	0.2	41.4	31.5
Lane LOS	A	A	E	D
Approach Delay (s)	2.7	0.2	41.4	31.5
Approach LOS			E	D

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	140	5	55	555	140	30	270	235	50	145	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.975			0.941				0.850
Flt Protected		0.983			0.996			0.997			0.987	
Satd. Flow (prot)	0	1779	1538	0	1757	0	0	1698	0	0	1786	1538
Flt Permitted		0.983			0.996			0.997			0.987	
Satd. Flow (perm)	0	1779	1538	0	1757	0	0	1698	0	0	1786	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	156	6	61	617	156	33	300	261	56	161	361
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	239	6	0	834	0	0	594	0	0	217	361
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	140	5	55	555	140	30	270	235	50	145	325
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	156	6	61	617	156	33	300	261	56	161	361
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1243	910	171	863	1141	441	527			566		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1243	910	171	863	1141	441	527			566		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	37	99	51	0	74	97			94		
cM capacity (veh/h)	0	246	858	124	179	605	1020			987		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	239	6	833	594	217	361
Volume Left	83	0	61	33	56	0
Volume Right	0	6	156	261	0	361
cSH	0	858	199	1020	987	1700
Volume to Capacity	Err	0.01	4.19	0.03	0.06	0.21
Queue Length 95th (ft)	Err	0	Err	3	4	0
Control Delay (s)	Err	9.2	Err	0.9	2.7	0.0
Lane LOS	F	A	F	A	A	
Approach Delay (s)	Err		Err	0.9	1.0	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	107.3%	ICU Level of Service	G	
Analysis Period (min)	15			

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	995	170	110	730	0	0	0	0	535	1	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.88	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4777	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.169							0.952	
Satd. Flow (perm)	0	4777	1538	306	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1106	94	122	811	0	0	0	0	594	1	933
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1106	94	122	811	0	0	0	0	0	595	933
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

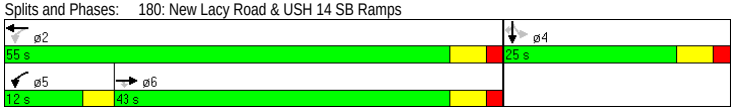
Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.51	0.14	0.40	0.42						1.18	1.18
Control Delay		16.6	13.2	7.8	6.5						131.3	123.7
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		16.6	13.2	7.8	6.5						131.3	123.7
90th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		38.1	38.1	7.4	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		36.8	36.8	6.8	47.1					20.9	20.9	20.9
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		33.0	33.0	6.2	42.7					25.3	25.3	25.3
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		35.3	35.3	0.0	35.3					32.7	32.7	32.7
10th %ile Term Code		Coord	Coord	Skip	Coord					Max	Max	Max
Queue Length 50th (ft)		140	26	27	145						~391	~347
Queue Length 95th (ft)		178	53	m6	35						#606	#493
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2222	715	330	2106						503	791
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.50	0.13	0.37	0.39						1.18	1.18

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	995	170	110	730	0	0	0	0	535	1	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		*0.88	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4777	1538	1719	3438						1723	2707
Flt Permitted		1.00	1.00	0.17	1.00						0.95	1.00
Satd. Flow (perm)		4777	1538	305	3438						1723	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1106	94	122	811	0	0	0	0	594	1	933
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1106	94	122	811	0	0	0	0	0	595	933
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		35.3	35.3	44.6	44.6						23.4	23.4
Effective Green, g (s)		35.3	35.3	44.6	44.6						23.4	23.4
Actuated g/C Ratio		0.44	0.44	0.56	0.56						0.29	0.29
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2108	679	273	1917						504	792
v/s Ratio Prot		c0.23		0.03	c0.24							
v/s Ratio Perm			0.06	0.22							0.35	0.34
v/c Ratio		0.52	0.14	0.45	0.42						1.18	1.18
Uniform Delay, d1		16.3	13.3	9.5	10.2						28.3	28.3
Progression Factor		1.00	1.00	0.75	0.61						1.00	1.00
Incremental Delay, d2		0.9	0.4	0.3	0.5						100.2	93.1
Delay (s)		17.2	13.7	7.4	6.8						128.5	121.4
Level of Service		B	B	A	A						F	F
Approach Delay (s)		16.9			6.9			0.0			124.1	
Approach LOS		B			A			A			F	

Intersection Summary				
HCM Average Control Delay	59.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	775	0	0	600	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	839	861	0	0	667	264	267	1	72	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	839	861	0	0	667	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

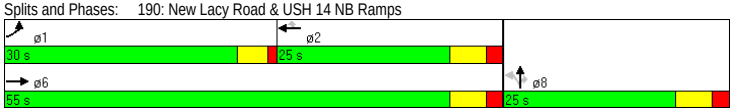
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.73			0.63	0.56		0.79	0.24			
Control Delay	20.3	15.7			29.1	31.6		46.9	27.7			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	20.3	15.7			29.1	31.6		46.9	27.7			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
70th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	24.4	51.3			22.4	22.4	16.7	16.7	16.7			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	22.1	54.0			27.4	27.4	14.0	14.0	14.0			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	18.7	57.8			34.6	34.6	10.2	10.2	10.2			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	196	247			156	114		126	30			
Queue Length 95th (ft)	256	m266			#249	#229		202	63			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1063	1182			1052	471		409	365			
Starvation Cap Reductn	0	15			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.79	0.74			0.63	0.56		0.66	0.20			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	775	0	0	600	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	839	861	0	0	667	264	267	1	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	839	861	0	0	667	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	23.2	52.2			24.5	24.5		15.8	15.8			
Effective Green, g (s)	23.2	52.2			24.5	24.5		15.8	15.8			
Actuated g/C Ratio	0.29	0.65			0.31	0.31		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	967	1181			1053	471		340	304			
v/s Ratio Prot	c0.25	c0.48			0.19							
v/s Ratio Perm						0.17		0.16	0.05			
v/c Ratio	0.87	0.73			0.63	0.56		0.79	0.24			
Uniform Delay, d1	26.9	9.2			23.9	23.2		30.5	27.0			
Progression Factor	0.41	1.33			1.00	1.00		1.00	1.00			
Incremental Delay, d2	7.2	1.1			2.9	4.8		10.6	0.1			
Delay (s)	18.2	13.4			26.8	28.0		41.1	27.2			
Level of Service	B	B			C	C		D	C			
Approach Delay (s)		15.8			27.1			38.2			0.0	
Approach LOS		B			C			D			A	

Intersection Summary

HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	305	175	30	115	295	100	820	90	170	485	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99		1.00		0.98	1.00	1.00	
Frt		0.945			0.892				0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1700	0	1719	1591	0	1719	3438	1538	1719	3318	0
Flt Permitted	0.178			0.466			0.396			0.136		
Satd. Flow (perm)	322	1700	0	840	1591	0	714	3438	1511	246	3318	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	378	339	194	33	128	328	111	911	50	189	539	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	533	0	33	456	0	111	911	50	189	672	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.96	0.74		0.19	1.40		0.58	0.98	0.12	0.67	0.46	
Control Delay	61.6	30.1		34.5	230.6		43.4	59.8	27.1	28.6	18.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	61.6	30.1		34.5	230.6		43.4	59.8	27.1	28.6	18.7	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Max	Hold	
70th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	12.3	41.8	
70th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	10.6	40.1	
50th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	9.1	38.6	
30th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	6.9	36.4	
10th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	159	249		16	~353		55	272	22	65	137	
Queue Length 95th (ft)	#366	#409		45	#569		#131	#433	53	121	183	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	392	722		171	325		193	929	408	354	1628	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.96	0.74		0.19	1.40		0.58	0.98	0.12	0.53	0.41	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 90.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 95	
70th %ile Actuated Cycle: 92.3	
50th %ile Actuated Cycle: 90.6	
30th %ile Actuated Cycle: 89.1	
10th %ile Actuated Cycle: 86.9	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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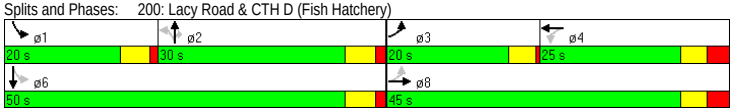
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	305	175	30	115	295	100	820	90	170	485	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.89		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1695		1709	1592		1713	3438	1511	1719	3319	
Flt Permitted	0.18	1.00		0.47	1.00		0.40	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	322	1695		838	1592		714	3438	1511	245	3319	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	378	339	194	33	128	328	111	911	50	189	539	133
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	378	533	0	33	456	0	111	911	50	189	672	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	40.2	40.2	
Effective Green, g (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	40.2	40.2	
Actuated g/C Ratio	0.42	0.42		0.20	0.20		0.27	0.27	0.27	0.44	0.44	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	383	719		171	325		193	929	408	282	1471	
v/s Ratio Prot	c0.17	0.31			c0.29			c0.26		c0.08	0.20	
v/s Ratio Perm	0.25			0.04			0.16		0.03	0.22		
v/c Ratio	0.99	0.74		0.19	1.40		0.58	0.98	0.12	0.67	0.46	
Uniform Delay, d1	24.1	21.9		29.9	36.1		28.6	32.9	25.0	19.4	17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	42.0	4.4		0.8	199.0		4.9	24.8	0.2	4.8	0.3	
Delay (s)	66.1	26.3		30.7	235.1		33.5	57.7	25.2	24.3	17.9	
Level of Service	E	C		C	F		C	E	C	C	B	
Approach Delay (s)		42.8			221.3			53.6			19.3	
Approach LOS		D			F			D			B	

Intersection Summary					
HCM Average Control Delay	66.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.05				
Actuated Cycle Length (s)	90.7	Sum of lost time (s)		21.0	
Intersection Capacity Utilization	93.0%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	320	210	85	235	15	135	30	30	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.991			0.979			0.962	
Flt Protected		0.988		0.950				0.966			0.986	
Satd. Flow (prot)	0	1788	1538	1719	1793	0	0	1711	0	0	1716	0
Flt Permitted		0.988		0.950				0.966			0.986	
Satd. Flow (perm)	0	1788	1538	1719	1793	0	0	1711	0	0	1716	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	356	233	94	261	17	150	33	33	11	17	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	473	233	94	278	0	0	216	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	320	210	85	235	15	135	30	30	10	15	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	356	233	94	261	17	150	33	33	11	17	11
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	283			594			1068	1066	366	1107	1291	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			594			1068	1066	366	1107	1291	279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			90			0	81	95	91	87	99
cM capacity (veh/h)	1257			964			149	178	667	128	131	746

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	472	233	94	278	217	39
Volume Left	117	0	94	0	150	11
Volume Right	0	233	0	17	33	11
cSH	1257	1700	964	1700	174	170
Volume to Capacity	0.09	0.14	0.10	0.16	1.25	0.23
Queue Length 95th (ft)	8	0	8	0	302	21
Control Delay (s)	2.7	0.0	9.1	0.0	201.9	32.4
Lane LOS	A		A		F	D
Approach Delay (s)	1.8		2.3		201.9	32.4
Approach LOS					F	D

Intersection Summary				
Average Delay	35.4			
Intersection Capacity Utilization	63.6%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	245	40	20	260	45	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.898	
Flt Protected			0.950		0.988	
Satd. Flow (prot)	1810	1538	1719	1810	1605	0
Flt Permitted			0.950		0.988	
Satd. Flow (perm)	1810	1538	1719	1810	1605	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	272	44	22	289	50	156
Shared Lane Traffic (%)						
Lane Group Flow (vph)	272	44	22	289	206	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	245	40	20	260	45	140
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	272	44	22	289	50	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			317		606	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			317		606	272
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	80
cM capacity (veh/h)			1227		447	759

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	272	44	22	289	206
Volume Left	0	0	22	0	50
Volume Right	0	44	0	0	156
cSH	1700	1700	1227	1700	649
Volume to Capacity	0.16	0.03	0.02	0.17	0.32
Queue Length 95th (ft)	0	0	1	0	34
Control Delay (s)	0.0	0.0	8.0	0.0	13.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.6		13.1
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		34.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	380	5	15	415	1	5	1	20	1	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.898			0.886	
Flt Protected		0.998			0.998			0.990			0.996	
Satd. Flow (prot)	0	1806	1538	0	1806	0	0	1609	0	0	1597	0
Flt Permitted		0.998			0.998			0.990			0.996	
Satd. Flow (perm)	0	1806	1538	0	1806	0	0	1609	0	0	1597	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	422	6	17	461	1	6	1	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	439	6	0	479	0	0	29	0	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	380	5	15	415	1	5	1	20	1	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	422	6	17	461	1	6	1	22	1	1	11
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	462			433			972	956	432	978	961	467
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	462			433			972	956	432	978	961	467
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			97	100	96	99	100	98
cM capacity (veh/h)	1083			1106			216	246	612	211	245	587

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	439	6	479	29	13
Volume Left	17	0	17	6	1
Volume Right	0	6	1	22	11
cSH	1083	1700	1106	434	464
Volume to Capacity	0.02	0.00	0.02	0.07	0.03
Queue Length 95th (ft)	1	0	1	5	2
Control Delay (s)	0.5	0.0	0.5	13.9	13.0
Lane LOS	A		A	B	B
Approach Delay (s)	0.5		0.5	13.9	13.0
Approach LOS				B	B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	45.6%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	365	20	50	440	20	15	1	45	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		125	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993				0.850		0.901			0.934	
Flt Protected		0.999			0.995			0.988			0.976	
Satd. Flow (prot)	0	1795	0	0	1800	1538	0	1611	0	0	1650	0
Flt Permitted		0.999			0.995			0.988			0.976	
Satd. Flow (perm)	0	1795	0	0	1800	1538	0	1611	0	0	1650	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	406	22	56	489	22	17	1	50	17	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	439	0	0	545	22	0	68	0	0	35	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	365	20	50	440	20	15	1	45	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	406	22	56	489	22	17	1	50	17	1	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	511			428			1056	1061	417	1089	1050	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511			428			1056	1061	417	1089	1050	489
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			91	99	92	90	99	97
cM capacity (veh/h)	1039			1116			185	208	630	166	211	573

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	439	544	22	68	34
Volume Left	11	56	0	17	17
Volume Right	22	0	22	50	17
cSH	1039	1116	1700	388	256
Volume to Capacity	0.01	0.05	0.01	0.17	0.13
Queue Length 95th (ft)	1	4	0	16	11
Control Delay (s)	0.3	1.4	0.0	16.2	21.2
Lane LOS	A	A		C	C
Approach Delay (s)	0.3	1.3		16.2	21.2
Approach LOS				C	C

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	58.5%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	285	5	50	425	55	25	345	165	30	115	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.986			0.958			0.960	
Flt Protected		0.984			0.995			0.998			0.993	
Satd. Flow (prot)	0	1777	0	0	1775	0	0	1730	0	0	1725	0
Flt Permitted		0.984			0.995			0.998			0.993	
Satd. Flow (perm)	0	1777	0	0	1775	0	0	1730	0	0	1725	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	150	317	6	56	472	61	28	383	183	33	128	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	473	0	0	589	0	0	594	0	0	228	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	135	285	5	50	425	55	25	345	165	30	115	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	150	317	6	56	472	61	28	383	183	33	128	67
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1066	860	171	932	802	485	199			572		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1066	860	171	932	802	485	199			572		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	99	0	0	89	98			97		
cM capacity (veh/h)	0	272	858	0	295	571	1349			982		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	472	589	594	228
Volume Left	150	56	28	33
Volume Right	6	61	183	67
cSH	0	0	1349	982
Volume to Capacity	Err	Err	0.02	0.03
Queue Length 95th (ft)	Err	Err	2	3
Control Delay (s)	Err	Err	0.6	1.6
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	0.6	1.6
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		92.5%	ICU Level of Service	F
Analysis Period (min)		15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	285	90	110	320	50	25	315	45	140	480	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.975			0.986			0.984				0.850
Flt Protected		0.989			0.989			0.997			0.989	
Satd. Flow (prot)	0	1745	0	0	1765	0	0	1775	0	0	1790	1538
Flt Permitted		0.989			0.989			0.997			0.989	
Satd. Flow (perm)	0	1745	0	0	1765	0	0	1775	0	0	1790	1538
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		753			1231			1544			431	
Travel Time (s)		14.7			24.0			30.1			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	317	100	122	356	56	28	350	50	156	533	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	534	0	0	534	0	0	428	0	0	689	206
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	285	90	110	320	50	25	315	45	140	480	185
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	317	100	122	356	56	28	350	50	156	533	206
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	416			422			1504	1266	377	1463	1288	393
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	416			422			1504	1266	377	1463	1288	393
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			89			0	0	92	0	0	68
cM capacity (veh/h)	1122			1117			0	132	658	0	128	644

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	533	533	428	689	206
Volume Left	117	122	28	156	0
Volume Right	100	56	50	0	206
cSH	1122	1117	0	0	644
Volume to Capacity	0.10	0.11	Err	Err	0.32
Queue Length 95th (ft)	9	9	Err	Err	34
Control Delay (s)	2.8	2.9	Err	Err	13.2
Lane LOS	A	A	F	F	B
Approach Delay (s)	2.8	2.9	Err	Err	
Approach LOS			F	F	

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	99.1%	ICU Level of Service	F	
Analysis Period (min)	15			

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	15	90	5	150	5	980	305	500	210	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.955		0.950			0.950		
Satd. Flow (prot)	0	1732	1538	0	1728	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.957			0.955		0.950			0.950		
Satd. Flow (perm)	0	1732	1538	0	1728	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	17	100	6	167	6	1089	339	556	233	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	17	0	106	167	6	1089	339	556	233	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	5	15	90	5	150	5	980	305	500	210	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	6	17	100	6	167	6	1089	339	556	233	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2624	2793	243	2474	2477	1099	261			1433		
vC1, stage 1 conf vol	1349	1349		1105	1105							
vC2, stage 2 conf vol	1274	1444		1369	1372							
vCu, unblocked vol	2624	2793	243	2474	2477	1099	261			1433		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	98	0	0	34	100			0		
cM capacity (veh/h)	0	0	782	0	0	253	1281			463		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	56	17	106	167	6	1089	339	556	233	22
Volume Left	50	0	100	0	6	0	0	556	0	0
Volume Right	0	17	0	167	0	0	339	0	0	22
cSH	0	782	0	253	1281	1700	1700	463	1700	1700
Volume to Capacity	Err	0.02	Err	0.66	0.00	0.64	0.20	1.20	0.14	0.01
Queue Length 95th (ft)	Err	2	Err	105	0	0	0	533	0	0
Control Delay (s)	Err	9.7	Err	43.1	7.8	0.0	0.0	136.6	0.0	0.0
Lane LOS	F	A	F	E	A			F		
Approach Delay (s)	Err		Err		0.0			93.5		
Approach LOS	F		F							

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		101.4%	ICU Level of Service	G
Analysis Period (min)		15		

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	540	195	20	175	1	50	1	25	10	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960			0.999			0.956			0.959	
Flt Protected	0.950			0.950				0.968			0.990	
Satd. Flow (prot)	1719	1737	0	1719	1808	0	0	1675	0	0	1718	0
Flt Permitted	0.950			0.950				0.968			0.990	
Satd. Flow (perm)	1719	1737	0	1719	1808	0	0	1675	0	0	1718	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	600	217	22	194	1	56	1	28	11	28	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	817	0	22	195	0	0	85	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	540	195	20	175	1	50	1	25	10	25	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	600	217	22	194	1	56	1	28	11	28	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	201			822			1088	1058	718	978	1166	205
vC1, stage 1 conf vol							813	813		244	244	
vC2, stage 2 conf vol							274	245		733	922	
vCu, unblocked vol	201			822			1088	1058	718	978	1166	205
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			83	100	93	97	91	98
cM capacity (veh/h)	1348			791			323	346	420	326	295	821

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	817	22	196	84	56
Volume Left	50	0	22	0	56	11
Volume Right	0	217	0	1	28	17
cSH	1348	1700	791	1700	350	374
Volume to Capacity	0.04	0.48	0.03	0.12	0.24	0.15
Queue Length 95th (ft)	3	0	2	0	23	13
Control Delay (s)	7.8	0.0	9.7	0.0	18.5	16.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.4		1.0		18.5	16.3
Approach LOS					C	C

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	58.6%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
320: Nobel Drive & Mica Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	95	225	185	110	125	40	10	40	25	35	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.895			0.920			0.940			0.960	
Flt Protected	0.950			0.950				0.978			0.985	
Satd. Flow (prot)	1719	1620	0	1719	1665	0	0	1664	0	0	1711	0
Flt Permitted	0.950			0.950				0.978			0.985	
Satd. Flow (perm)	1719	1620	0	1719	1665	0	0	1664	0	0	1711	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	106	250	206	122	139	44	11	44	28	39	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	356	0	206	261	0	0	99	0	0	95	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	150	95	225	185	110	125	40	10	40	25	35	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	167	106	250	206	122	139	44	11	44	28	39	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	261			356			1144	1236	231	1092	1292	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			356			1144	1236	231	1092	1292	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			83			55	91	94	79	66	97
cM capacity (veh/h)	1286			1187			99	125	801	131	116	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	167	356	206	261	100	94
Volume Left	167	0	206	0	44	28
Volume Right	0	250	0	139	44	28
cSH	1286	1700	1187	1700	169	163
Volume to Capacity	0.13	0.21	0.17	0.15	0.59	0.58
Queue Length 95th (ft)	11	0	16	0	80	76
Control Delay (s)	8.2	0.0	8.7	0.0	53.4	54.0
Lane LOS	A		A		F	F
Approach Delay (s)	2.6		3.8		53.4	54.0
Approach LOS					F	F

Intersection Summary				
Average Delay	11.5			
Intersection Capacity Utilization	47.3%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	135	15	105	365	1	20	10	40	5	30	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.985						0.923			0.932	
Flt Protected	0.950			0.950				0.986			0.996	
Satd. Flow (prot)	1719	1782	0	1719	1810	0	0	1647	0	0	1680	0
Flt Permitted	0.950			0.950				0.986			0.996	
Satd. Flow (perm)	1719	1782	0	1719	1810	0	0	1647	0	0	1680	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	150	17	117	406	1	22	11	44	6	33	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	167	0	117	407	0	0	77	0	0	78	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	135	15	105	365	1	20	10	40	5	30	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	150	17	117	406	1	22	11	44	6	33	39
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	412			172			885	831	168	872	838	416
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412			172			885	831	168	872	838	416
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			89	96	95	98	88	94
cM capacity (veh/h)	1126			1382			204	272	861	225	269	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	167	117	407	78	78
Volume Left	11	0	117	0	22	6
Volume Right	0	17	0	1	44	39
cSH	1126	1700	1382	1700	386	369
Volume to Capacity	0.01	0.10	0.08	0.24	0.20	0.21
Queue Length 95th (ft)	1	0	7	0	19	20
Control Delay (s)	8.2	0.0	7.8	0.0	16.7	17.4
Lane LOS	A		A		C	C
Approach Delay (s)	0.5		1.7		16.7	17.4
Approach LOS					C	C

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	43.5%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	120	45	25	400	1	45	5	25	20	15	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.959						0.955			0.944	
Flt Protected	0.950			0.950				0.971			0.984	
Satd. Flow (prot)	1719	1735	0	1719	1810	0	0	1678	0	0	1681	0
Flt Permitted	0.950			0.950				0.971			0.984	
Satd. Flow (perm)	1719	1735	0	1719	1810	0	0	1678	0	0	1681	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	133	50	28	444	1	50	6	28	22	17	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	183	0	28	445	0	0	84	0	0	67	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	120	45	25	400	1	45	5	25	20	15	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	133	50	28	444	1	50	6	28	22	17	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			188			738	703	168	708	727	455
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			188			738	703	168	708	727	455
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			83	98	97	93	95	95
cM capacity (veh/h)	1090			1362			290	343	861	317	332	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	183	28	446	83	67
Volume Left	17	0	28	0	50	22
Volume Right	0	50	0	1	28	28
cSH	1090	1700	1362	1700	377	399
Volume to Capacity	0.02	0.11	0.02	0.26	0.22	0.17
Queue Length 95th (ft)	1	0	2	0	21	15
Control Delay (s)	8.4	0.0	7.7	0.0	17.2	15.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.7		0.5		17.2	15.8
Approach LOS					C	C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	36.3%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	100	50	185	235	1	120	515	390	1	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961						0.949			0.952	
Flt Protected		0.993			0.978			0.994				
Satd. Flow (prot)	0	1727	0	0	1770	0	0	1707	0	0	1723	0
Flt Permitted		0.993			0.978			0.994				
Satd. Flow (perm)	0	1727	0	0	1770	0	0	1707	0	0	1723	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	111	56	206	261	1	133	572	433	1	122	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	195	0	0	468	0	0	1138	0	0	190	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	100	50	185	235	1	120	515	390	1	110	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	111	56	206	261	1	133	572	433	1	122	67
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1355	1440	166	1334	1257	799	194			1011		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1355	1440	166	1334	1257	799	194			1011		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	5	94	0	0	100	90			100		
cM capacity (veh/h)	0	117	864	17	151	378	1356			671		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	194	468	1139	190
Volume Left	28	206	133	1
Volume Right	56	1	433	67
cSH	0	33	1356	671
Volume to Capacity	Err	14.17	0.10	0.00
Queue Length 95th (ft)	Err	Err	8	0
Control Delay (s)	Err	Err	2.6	0.1
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	2.6	0.1
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		114.4%	ICU Level of Service	H
Analysis Period (min)		15		

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	225	870	75	55	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	33	250	967	83	61	233
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	250	967	83	61	233
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	225	870	75	55	210
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	250	967	83	61	233
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	977			1055	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	977			1055	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	78	16			91	
cM capacity (veh/h)	150	298			646	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	250	967	83	61	233
Volume Left	33	0	0	0	61	0
Volume Right	0	250	0	83	0	0
cSH	150	298	1700	1700	646	1700
Volume to Capacity	0.22	0.84	0.57	0.05	0.09	0.14
Queue Length 95th (ft)	20	178	0	0	8	0
Control Delay (s)	35.6	57.5	0.0	0.0	11.2	0.0
Lane LOS	E	F			B	
Approach Delay (s)	54.9		0.0		2.3	
Approach LOS	F					

Intersection Summary				
Average Delay		10.0		
Intersection Capacity Utilization		66.9%	ICU Level of Service	C
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	190	1	1	225	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.900	
Flt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Flt Permitted					0.987	
Satd. Flow (perm)	1808	0	0	1810	1607	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	211	1	1	250	6	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	0	0	251	23	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	190	1	1	225	5	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	1	1	250	6	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		464	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		464	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1340		551	821

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	212	251	22
Volume Left	0	1	6
Volume Right	1	0	17
cSH	1700	1340	731
Volume to Capacity	0.12	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		22.6%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	45	35	5	70	130	115	770	1	50	255	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.915						0.984	
Flt Protected		0.970			0.999			0.994			0.993	
Satd. Flow (prot)	0	1715	0	0	1654	0	0	1799	0	0	1768	0
Flt Permitted		0.970			0.999			0.994			0.993	
Satd. Flow (perm)	0	1715	0	0	1654	0	0	1799	0	0	1768	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	50	39	6	78	144	128	856	1	56	283	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	228	0	0	985	0	0	383	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	45	35	5	70	130	115	770	1	50	255	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	139	50	39	6	78	144	128	856	1	56	283	44
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1722	1539	316	1602	1561	866	333			862		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1722	1539	316	1602	1561	866	333			862		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	47	95	86	14	58	89			93		
cM capacity (veh/h)	10	94	712	40	91	345	1205			764		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	228	228	984	383
Volume Left	139	6	128	56
Volume Right	39	144	1	44
cSH	15	161	1205	764
Volume to Capacity	14.88	1.42	0.11	0.07
Queue Length 95th (ft)	Err	358	9	6
Control Delay (s)	Err	272.3	2.6	2.2
Lane LOS	F	F	A	A
Approach Delay (s)	Err	272.3	2.6	2.2
Approach LOS	F	F		

Intersection Summary				
Average Delay	1285.0			
Intersection Capacity Utilization	95.1%	ICU Level of Service	F	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	700	5	815	15	360	1300	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99	0.98	1.00	1.00		1.00	1.00	
Frt		0.962				0.850		0.997			0.990	
Flt Protected		0.969			0.957		0.950			0.950		
Satd. Flow (prot)	0	1678	0	0	1732	1538	1719	3426	0	1719	3398	0
Flt Permitted		0.641			0.694		0.137			0.161		
Satd. Flow (perm)	0	1107	0	0	1249	1510	248	3426	0	291	3398	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	22	233	28	389	6	906	17	400	1444	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	0	0	261	389	6	923	0	400	1550	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.28			0.82	1.01	0.06	0.69		1.10	0.77	
Control Delay		28.4			51.5	80.9	15.0	21.8		93.6	14.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.4			51.5	80.9	15.0	21.8		93.6	14.5	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Hold	Hold		Max	Max	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	35.9	35.9		10.0	50.9	
70th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	28.1	28.1		10.0	43.1	
50th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
30th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	24.5	24.5		10.0	39.5	
30th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Gap		Max	Hold	
10th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	20.1	20.1		10.0	35.1	
10th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Gap		Max	Hold	
Queue Length 50th (ft)		28			111	177	2	182		~143	255	
Queue Length 95th (ft)		76			#283	#418	9	241		#336	333	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		282			319	385	131	1818		365	2488	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.28			0.82	1.01	0.05	0.51		1.10	0.62	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 75.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 81.4	
50th %ile Actuated Cycle: 73.6	
30th %ile Actuated Cycle: 70	
10th %ile Actuated Cycle: 65.6	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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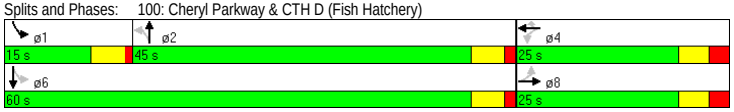
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	700	5	815	15	360	1300	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1674			1724	1511	1718	3427		1719	3397	
Flt Permitted		0.64			0.69	1.00	0.14	1.00		0.16	1.00	
Satd. Flow (perm)		1108			1249	1511	249	3427		291	3397	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	50	6	22	233	28	389	6	906	17	400	1444	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	78	0	0	261	389	6	923	0	400	1550	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		19.2			19.2	19.2	29.2	29.2		44.3	44.3	
Effective Green, g (s)		19.2			19.2	19.2	29.2	29.2		44.3	44.3	
Actuated g/C Ratio		0.26			0.26	0.26	0.39	0.39		0.59	0.59	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		284			320	387	97	1334		364	2006	
v/s Ratio Prot								0.27		c0.15	0.46	
v/s Ratio Perm		0.07			0.21	c0.26	0.02			c0.50		
v/c Ratio		0.27			0.82	1.01	0.06	0.69		1.10	0.77	
Uniform Delay, d1		22.3			26.2	27.9	14.3	19.1		16.2	11.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			15.1	47.0	0.4	1.7		76.5	2.0	
Delay (s)		23.0			41.3	74.9	14.7	20.8		92.7	13.6	
Level of Service		C			D	E	B	C		F	B	
Approach Delay (s)		23.0			61.4			20.8			29.8	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	365	10	15	770	15	40	5	10	55	20	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.997			0.976			0.905	
Flt Protected		0.990			0.999			0.965			0.989	
Satd. Flow (prot)	0	1786	0	0	1802	0	0	1704	0	0	1620	0
Flt Permitted		0.990			0.999			0.965			0.989	
Satd. Flow (perm)	0	1786	0	0	1802	0	0	1704	0	0	1620	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	100	406	11	17	856	17	44	6	11	61	22	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	517	0	0	890	0	0	61	0	0	277	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	365	10	15	770	15	40	5	10	55	20	175
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	406	11	17	856	17	44	6	11	61	22	194
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	877			422			1724	1527	421	1532	1524	874
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	877			296			1750	1530	295	1536	1527	874
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			99			0	94	98	11	75	43
cM capacity (veh/h)	754			1113			18	87	654	68	88	342

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	517	889	61	278
Volume Left	100	17	44	61
Volume Right	11	17	11	194
cSH	754	1113	24	162
Volume to Capacity	0.13	0.01	2.54	1.71
Queue Length 95th (ft)	11	1	191	494
Control Delay (s)	3.5	0.4	1042.9	395.2
Lane LOS	A	A	F	F
Approach Delay (s)	3.5	0.4	1042.9	395.2
Approach LOS			F	F

Intersection Summary				
Average Delay	100.7			
Intersection Capacity Utilization	91.9%	ICU Level of Service	F	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	295	565	25	275	200	55	10	155	65	140	310	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.986			0.962				0.850
Flt Protected		0.983			0.975			0.998			0.985	
Satd. Flow (prot)	0	1779	1538	0	1740	0	0	1737	0	0	1782	1538
Flt Permitted		0.983			0.975			0.998			0.985	
Satd. Flow (perm)	0	1779	1538	0	1740	0	0	1737	0	0	1782	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	328	628	28	306	222	61	11	172	72	156	344	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	956	28	0	589	0	0	255	0	0	500	144
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	295	565	25	275	200	55	10	155	65	140	310	130
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	328	628	28	306	222	61	11	172	72	156	344	144
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1068	932	354	1238	1041	218	494			249		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1068	932	354	1238	1041	218	494			249		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	96	0	0	92	99			88		
cM capacity (veh/h)	0	227	677	0	196	807	1050			1293		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	956	28	589	256	500	144
Volume Left	328	0	306	11	156	0
Volume Right	0	28	61	72	0	144
cSH	0	677	0	1050	1293	1700
Volume to Capacity	Err	0.04	Err	0.01	0.12	0.08
Queue Length 95th (ft)	Err	3	Err	1	10	0
Control Delay (s)	Err	10.5	Err	0.5	3.4	0.0
Lane LOS	F	B	F	A	A	
Approach Delay (s)	Err		Err	0.5	2.6	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	125.5%	ICU Level of Service	H	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1490	210	75	435	0	0	0	0	375	1	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4940	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.091							0.952	
Satd. Flow (perm)	0	4940	1538	165	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1656	117	83	483	0	0	0	0	417	1	592
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1656	117	83	483	0	0	0	0	0	418	592
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

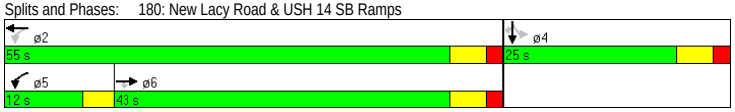
Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.65	0.15	0.36	0.23						1.02	0.92
Control Delay		16.5	12.0	12.4	6.5						83.2	52.1
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		16.5	12.0	12.4	6.5						83.2	52.1
90th %ile Green (s)		38.1	38.1	7.4	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
70th %ile Green (s)		39.0	39.0	6.5	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
30th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
30th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
10th %ile Green (s)		49.0	49.0	0.0	49.0					19.0	19.0	19.0
10th %ile Term Code		Coord	Coord	Skip	Coord					Max	Max	Max
Queue Length 50th (ft)		218	30	41	81						~217	164
Queue Length 95th (ft)		280	61	85	112						#397	#271
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2533	788	271	2106						409	643
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		21	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.66	0.15	0.31	0.23						1.02	0.92

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1490	210	75	435	0	0	0	0	375	1	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4940	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.09	1.00						0.95	1.00
Satd. Flow (perm)		4940	1538	165	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1656	117	83	483	0	0	0	0	417	1	592
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1656	117	83	483	0	0	0	0	0	418	592
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		40.3	40.3	49.0	49.0						19.0	19.0
Effective Green, g (s)		40.3	40.3	49.0	49.0						19.0	19.0
Actuated g/C Ratio		0.50	0.50	0.61	0.61						0.24	0.24
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2489	775	202	2106						409	643
v/s Ratio Prot		c0.34		c0.03	0.14							
v/s Ratio Perm			0.08	0.22							0.24	0.22
v/c Ratio		0.67	0.15	0.41	0.23						1.02	0.92
Uniform Delay, d1		14.8	10.7	9.1	7.0						30.5	29.8
Progression Factor		1.00	1.00	1.56	0.88						1.00	1.00
Incremental Delay, d2		1.4	0.4	0.4	0.2						50.2	18.4
Delay (s)		16.2	11.1	14.7	6.4						80.7	48.1
Level of Service		B	B	B	A						F	D
Approach Delay (s)		15.9			7.6			0.0			61.6	
Approach LOS		B			A			A			E	

Intersection Summary				
HCM Average Control Delay	28.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1070	795	0	0	345	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1189	883	0	0	383	183	183	1	50	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1189	883	0	0	383	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

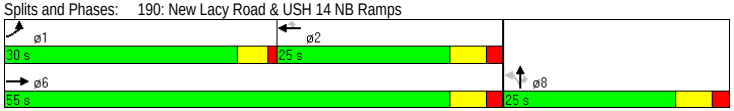
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.71			0.52	0.55		0.64	0.19			
Control Delay	17.1	13.5			30.1	34.5		41.0	29.1			
Queue Delay	0.0	0.7			0.0	0.0		0.0	0.0			
Total Delay	17.1	14.1			30.1	34.5		41.0	29.1			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	32.4	55.1			18.2	18.2	12.9	12.9	12.9			
50th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	37.6	57.3			15.2	15.2	10.7	10.7	10.7			
30th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	38.5	58.0			15.0	15.0	10.0	10.0	10.0			
10th %ile Term Code	Max	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	34	254			87	81		87	22			
Queue Length 95th (ft)	#456	m395			128	142		142	48			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1370	1236			817	365		409	365			
Starvation Cap Reductn	0	114			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.87	0.79			0.47	0.50		0.45	0.14			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 45 (56%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1070	795	0	0	345	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1189	883	0	0	383	183	183	1	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1189	883	0	0	383	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	32.9	54.6			17.2	17.2		13.4	13.4			
Effective Green, g (s)	32.9	54.6			17.2	17.2		13.4	13.4			
Actuated g/C Ratio	0.41	0.68			0.21	0.21		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1372	1235			739	331		289	258			
v/s Ratio Prot	c0.36	c0.49			0.11							
v/s Ratio Perm						0.12		0.11	0.03			
v/c Ratio	0.87	0.71			0.52	0.55		0.64	0.19			
Uniform Delay, d1	21.5	7.9			27.7	28.0		31.0	28.7			
Progression Factor	0.33	1.23			1.00	1.00		1.00	1.00			
Incremental Delay, d2	4.5	1.9			2.6	6.5		3.4	0.1			
Delay (s)	11.5	11.6			30.3	34.5		34.4	28.8			
Level of Service	B	B			C	C		C	C			
Approach Delay (s)		11.5			31.7			33.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	165	120	120	305	235	195	520	50	335	860	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99		1.00		0.98	1.00	0.99	
Frt		0.937			0.935				0.850		0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1684	0	1719	1678	0	1719	3438	1538	1719	3259	0
Flt Permitted	0.177			0.569			0.172			0.252		
Satd. Flow (perm)	320	1684	0	1025	1678	0	311	3438	1511	455	3259	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	128	183	133	133	339	261	217	578	28	372	956	406
Shared Lane Traffic (%)												
Lane Group Flow (vph)	128	316	0	133	600	0	217	578	28	372	1362	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.48	0.52		0.62	1.69		2.49	0.60	0.07	0.83	0.83	
Control Delay	24.2	25.9		46.2	350.8		727.4	30.9	24.8	32.7	24.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	24.2	25.9		46.2	350.8		727.4	30.9	24.8	32.7	24.3	
90th %ile Green (s)	12.3	34.8		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
70th %ile Green (s)	10.2	32.7		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
70th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
50th %ile Green (s)	8.8	31.3		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
50th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Max	
30th %ile Green (s)	7.5	30.0		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
30th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Hold	
10th %ile Green (s)	5.7	28.2		18.5	18.5		24.5	24.5	24.5	14.1	43.6	
10th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	46	136		67	~493		~202	145	11	122	319	
Queue Length 95th (ft)	85	216		#149	#726		#315	211	33	#269	451	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	379	740		216	354		87	961	422	449	1655	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.34	0.43		0.62	1.69		2.49	0.60	0.07	0.83	0.82	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 87.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 91.3	
70th %ile Actuated Cycle: 89.2	
50th %ile Actuated Cycle: 87.8	
30th %ile Actuated Cycle: 86.5	
10th %ile Actuated Cycle: 83.8	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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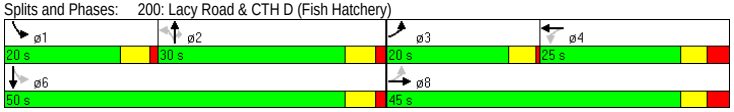
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	165	120	120	305	235	195	520	50	335	860	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1676		1706	1678		1717	3438	1512	1719	3260	
Flt Permitted	0.18	1.00		0.57	1.00		0.17	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	320	1676		1021	1678		310	3438	1512	457	3260	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	128	183	133	133	339	261	217	578	28	372	956	406
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	128	316	0	133	600	0	217	578	28	372	1362	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	31.4	31.4		18.6	18.6		24.5	24.5	24.5	44.3	44.3	
Effective Green, g (s)	31.4	31.4		18.6	18.6		24.5	24.5	24.5	44.3	44.3	
Actuated g/C Ratio	0.36	0.36		0.21	0.21		0.28	0.28	0.28	0.51	0.51	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	255	600		217	356		87	960	422	444	1647	
v/s Ratio Prot	0.05	c0.19			c0.36			0.17		0.14	c0.42	
v/s Ratio Perm	0.13			0.13			c0.70		0.02	0.28		
v/c Ratio	0.50	0.53		0.61	1.69		2.49	0.60	0.07	0.84	0.83	
Uniform Delay, d1	21.6	22.3		31.3	34.5		31.6	27.4	23.2	15.4	18.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.1		5.8	320.4		705.3	1.2	0.1	12.4	3.7	
Delay (s)	22.2	23.4		37.1	354.9		736.9	28.6	23.3	27.8	22.2	
Level of Service	C	C		D	F		F	C	C	C	C	
Approach Delay (s)		23.0			297.3			215.2			23.4	
Approach LOS		C			F			F			C	

Intersection Summary					
HCM Average Control Delay	119.4	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.77				
Actuated Cycle Length (s)	87.7	Sum of lost time (s)		24.0	
Intersection Capacity Utilization	103.9%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	300	155	25	365	10	230	15	75	20	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.996			0.969			0.904	
Flt Protected		0.995		0.950				0.965			0.994	
Satd. Flow (prot)	0	1800	1538	1719	1802	0	0	1692	0	0	1626	0
Flt Permitted		0.995		0.950				0.965			0.994	
Satd. Flow (perm)	0	1800	1538	1719	1802	0	0	1692	0	0	1626	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	333	172	28	406	11	256	17	83	22	33	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	372	172	28	417	0	0	356	0	0	188	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	300	155	25	365	10	230	15	75	20	30	120
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	333	172	28	406	11	256	17	83	22	33	133
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	422			511			1032	893	343	979	1060	421
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	422			511			1032	893	343	979	1060	421
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			0	94	88	87	84	79
cM capacity (veh/h)	1117			1035			135	259	687	178	206	621

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	372	172	28	417	356	189
Volume Left	39	0	28	0	256	22
Volume Right	0	172	0	11	83	133
cSH	1117	1700	1035	1700	171	377
Volume to Capacity	0.03	0.10	0.03	0.25	2.08	0.50
Queue Length 95th (ft)	3	0	2	0	697	68
Control Delay (s)	1.2	0.0	8.6	0.0	550.6	23.8
Lane LOS	A		A		F	C
Approach Delay (s)	0.8		0.5		550.6	23.8
Approach LOS					F	C

Intersection Summary				
Average Delay	131.1			
Intersection Capacity Utilization	80.0%	ICU Level of Service		D
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	310	50	190	290	40	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.912	
Flt Protected			0.950		0.983	
Satd. Flow (prot)	1810	1538	1719	1810	1622	0
Flt Permitted			0.950		0.983	
Satd. Flow (perm)	1810	1538	1719	1810	1622	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	344	56	211	322	44	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	56	211	322	127	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	310	50	190	290	40	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	344	56	211	322	44	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			400		1089	344
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			400		1089	344
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		77	88
cM capacity (veh/h)			1143		192	692

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	344	56	211	322	128
Volume Left	0	0	211	0	44
Volume Right	0	56	0	0	83
cSH	1700	1700	1143	1700	363
Volume to Capacity	0.20	0.03	0.18	0.19	0.35
Queue Length 95th (ft)	0	0	17	0	39
Control Delay (s)	0.0	0.0	8.9	0.0	20.2
Lane LOS			A		C
Approach Delay (s)	0.0		3.5		20.2
Approach LOS					C

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		43.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	450	5	15	435	1	5	1	10	1	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.917			0.886	
Flt Protected		0.999			0.998			0.984			0.996	
Satd. Flow (prot)	0	1808	1538	0	1806	0	0	1633	0	0	1597	0
Flt Permitted		0.999			0.998			0.984			0.996	
Satd. Flow (perm)	0	1808	1538	0	1806	0	0	1633	0	0	1597	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	500	6	17	483	1	6	1	11	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	511	6	0	501	0	0	18	0	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	450	5	15	435	1	5	1	10	1	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	500	6	17	483	1	6	1	11	1	1	11
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	484			511			1061	1045	510	1056	1050	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			511			1061	1045	510	1056	1050	489
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			97	99	98	99	99	98
cM capacity (veh/h)	1063			1035			188	219	553	190	218	571

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	511	6	501	18	13
Volume Left	11	0	17	6	1
Volume Right	0	6	1	11	11
cSH	1063	1700	1035	325	438
Volume to Capacity	0.01	0.00	0.02	0.05	0.03
Queue Length 95th (ft)	1	0	1	4	2
Control Delay (s)	0.3	0.0	0.5	16.7	13.5
Lane LOS	A		A	C	B
Approach Delay (s)	0.3		0.5	16.7	13.5
Approach LOS				C	B

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	46.6%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	475	20	55	410	15	30	1	55	25	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		125	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995				0.850		0.913			0.963	
Flt Protected		0.999			0.994			0.983			0.966	
Satd. Flow (prot)	0	1799	0	0	1799	1538	0	1624	0	0	1683	0
Flt Permitted		0.999			0.994			0.983			0.966	
Satd. Flow (perm)	0	1799	0	0	1799	1538	0	1624	0	0	1683	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	528	22	61	456	17	33	1	61	28	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	561	0	0	517	17	0	95	0	0	40	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	475	20	55	410	15	30	1	55	25	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	528	22	61	456	17	33	1	61	28	1	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	472			550			1151	1156	539	1201	1150	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472			550			1151	1156	539	1201	1150	456
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			79	99	89	79	99	98
cM capacity (veh/h)	1074			1005			160	180	537	133	182	599

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	561	517	17	96	40
Volume Left	11	61	0	33	28
Volume Right	22	0	17	61	11
cSH	1074	1005	1700	291	171
Volume to Capacity	0.01	0.06	0.01	0.33	0.23
Queue Length 95th (ft)	1	5	0	35	22
Control Delay (s)	0.3	1.7	0.0	23.3	32.3
Lane LOS	A	A		C	D
Approach Delay (s)	0.3	1.6		23.3	32.3
Approach LOS				C	D

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	63.6%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	450	40	55	310	40	25	125	20	70	395	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.990			0.987			0.984			0.968	
Flt Protected		0.994			0.993			0.993			0.994	
Satd. Flow (prot)	0	1781	0	0	1773	0	0	1768	0	0	1741	0
Flt Permitted		0.994			0.993			0.993			0.994	
Satd. Flow (perm)	0	1781	0	0	1773	0	0	1768	0	0	1741	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	72	500	44	61	344	44	28	139	22	78	439	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	449	0	0	189	0	0	678	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	450	40	55	310	40	25	125	20	70	395	145
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	72	500	44	61	344	44	28	139	22	78	439	161
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1107	902	529	1185	971	160	605			166		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1107	902	529	1185	971	160	605			166		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	92	0	0	95	97			94		
cM capacity (veh/h)	0	249	539	0	227	870	954			1388		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	617	450	189	678
Volume Left	72	61	28	78
Volume Right	44	44	22	161
cSH	0	0	954	1388
Volume to Capacity	Err	Err	0.03	0.06
Queue Length 95th (ft)	Err	Err	2	4
Control Delay (s)	Err	Err	1.6	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	1.6	1.5
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		86.8%	ICU Level of Service	E
Analysis Period (min)		15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	225	40	50	200	130	90	300	100	65	270	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.990			0.954			0.972				0.850
Flt Protected		0.975			0.993			0.991			0.990	
Satd. Flow (prot)	0	1747	0	0	1714	0	0	1743	0	0	1791	1538
Flt Permitted		0.975			0.993			0.991			0.990	
Satd. Flow (perm)	0	1747	0	0	1714	0	0	1743	0	0	1791	1538
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		753			1231			1544			431	
Travel Time (s)		14.7			24.0			30.1			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	306	250	44	56	222	144	100	333	111	72	300	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	600	0	0	422	0	0	544	0	0	372	128
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	275	225	40	50	200	130	90	300	100	65	270	115
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	306	250	44	56	222	144	100	333	111	72	300	128
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	372			299			1449	1371	282	1577	1321	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372			299			1449	1371	282	1577	1321	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	74			96			0	0	85	0	0	82
cM capacity (veh/h)	1166			1240			0	101	743	0	108	722

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	600	422	544	372	128
Volume Left	306	56	100	72	0
Volume Right	44	144	111	0	128
cSH	1166	1240	0	0	722
Volume to Capacity	0.26	0.04	Err	Err	0.18
Queue Length 95th (ft)	26	4	Err	Err	16
Control Delay (s)	6.1	1.5	Err	Err	11.1
Lane LOS	A	A	F	F	B
Approach Delay (s)	6.1	1.5	Err	Err	
Approach LOS			F	F	

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		109.0%	ICU Level of Service	H
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	5	275	5	455	5	335	100	150	1075	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.953		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1724	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.954			0.953		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1724	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	6	306	6	506	6	372	111	167	1194	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	6	0	312	506	6	372	111	167	1194	50
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	5	275	5	455	5	335	100	150	1075	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	6	306	6	506	6	372	111	167	1194	50
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2429	2032	1204	1927	1971	382	1249			488		
vC1, stage 1 conf vol	1533	1533		388	388							
vC2, stage 2 conf vol	897	499		1539	1583							
vCu, unblocked vol	2429	2032	1204	1927	1971	382	1249			488		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	99	97	0	96	23	99			84		
cM capacity (veh/h)	4	137	219	106	129	653	545			1055		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	23	6	311	506	6	372	111	167	1194	50
Volume Left	22	0	306	0	6	0	0	167	0	0
Volume Right	0	6	0	506	0	0	111	0	0	50
cSH	4	219	107	653	545	1700	1700	1055	1700	1700
Volume to Capacity	5.52	0.03	2.91	0.77	0.01	0.22	0.07	0.16	0.70	0.03
Queue Length 95th (ft)	Err	2	737	184	1	0	0	14	0	0
Control Delay (s)	Err	21.9	948.8	26.8	11.7	0.0	0.0	9.1	0.0	0.0
Lane LOS	F	C	F	D	B			A		
Approach Delay (s)	8080.3		378.0		0.1			1.1		
Approach LOS	F		F							

Intersection Summary				
Average Delay	198.0			
Intersection Capacity Utilization	92.1%	ICU Level of Service		F
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	170	45	1	535	10	165	10	10	10	5	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.969			0.997			0.993			0.894	
Flt Protected	0.950			0.950				0.957			0.993	
Satd. Flow (prot)	1719	1753	0	1719	1804	0	0	1720	0	0	1606	0
Flt Permitted	0.950			0.950				0.957			0.993	
Satd. Flow (perm)	1719	1753	0	1719	1804	0	0	1720	0	0	1606	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	189	50	1	594	11	183	11	11	11	6	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	239	0	1	605	0	0	205	0	0	78	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	170	45	1	535	10	165	10	10	10	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	189	50	1	594	11	183	11	11	11	6	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	611			244			940	887	224	873	907	610
vC1, stage 1 conf vol							274	274		607	607	
vC2, stage 2 conf vol							666	613		266	299	
vCu, unblocked vol	611			244			940	887	224	873	907	610
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			45	97	99	97	99	87
cM capacity (veh/h)	950			1300			335	415	801	431	431	485

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	28	239	1	606	206	78
Volume Left	28	0	1	0	183	11
Volume Right	0	50	0	11	11	61
cSH	950	1700	1300	1700	350	472
Volume to Capacity	0.03	0.14	0.00	0.36	0.59	0.16
Queue Length 95th (ft)	2	0	0	0	89	15
Control Delay (s)	8.9	0.0	7.8	0.0	28.9	14.1
Lane LOS	A		A		D	B
Approach Delay (s)	0.9		0.0		28.9	14.1
Approach LOS					D	B

Intersection Summary					
Average Delay	6.3				
Intersection Capacity Utilization	52.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
320: Nobel Drive & Mica Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	85	50	50	80	40	190	30	145	100	10	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.944			0.950			0.946			0.928	
Flt Protected	0.950			0.950				0.975			0.979	
Satd. Flow (prot)	1719	1708	0	1719	1719	0	0	1669	0	0	1644	0
Flt Permitted	0.950			0.950				0.975			0.979	
Satd. Flow (perm)	1719	1708	0	1719	1719	0	0	1669	0	0	1644	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	94	56	56	89	44	211	33	161	111	11	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	150	0	56	133	0	0	405	0	0	261	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	85	50	50	80	40	190	30	145	100	10	125
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	94	56	56	89	44	211	33	161	111	11	139
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			150			544	444	122	572	450	111
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			150			544	444	122	572	450	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			40	93	83	65	98	85
cM capacity (veh/h)	1433			1413			353	471	921	316	467	934

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	39	150	56	133	406	261
Volume Left	39	0	56	0	211	111
Volume Right	0	56	0	44	161	139
cSH	1433	1700	1413	1700	481	498
Volume to Capacity	0.03	0.09	0.04	0.08	0.84	0.52
Queue Length 95th (ft)	2	0	3	0	212	75
Control Delay (s)	7.6	0.0	7.7	0.0	41.1	19.9
Lane LOS	A		A		E	C
Approach Delay (s)	1.6		2.3		41.1	19.9
Approach LOS					E	C

Intersection Summary				
Average Delay	21.6			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	280	15	40	145	5	10	25	100	5	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.995			0.900			0.932	
Flt Protected	0.950			0.950				0.996			0.991	
Satd. Flow (prot)	1719	1795	0	1719	1800	0	0	1622	0	0	1671	0
Flt Permitted	0.950			0.950				0.996			0.991	
Satd. Flow (perm)	1719	1795	0	1719	1800	0	0	1622	0	0	1671	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	311	17	44	161	6	11	28	111	6	11	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	328	0	44	167	0	0	150	0	0	34	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	280	15	40	145	5	10	25	100	5	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	311	17	44	161	6	11	28	111	6	11	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	172			333			679	663	329	777	668	174
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	172			333			679	663	329	777	668	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			97	92	84	98	97	98
cM capacity (veh/h)	1382			1205			324	351	699	230	348	855

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	39	328	44	167	150	33
Volume Left	39	0	44	0	11	6
Volume Right	0	17	0	6	111	17
cSH	1382	1700	1205	1700	551	441
Volume to Capacity	0.03	0.19	0.04	0.10	0.27	0.08
Queue Length 95th (ft)	2	0	3	0	27	6
Control Delay (s)	7.7	0.0	8.1	0.0	14.0	13.8
Lane LOS	A		A		B	B
Approach Delay (s)	0.8		1.7		14.0	13.8
Approach LOS					B	B

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	335	30	20	135	25	35	5	25	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.976			0.948			0.924	
Flt Protected	0.950			0.950				0.974			0.986	
Satd. Flow (prot)	1719	1788	0	1719	1766	0	0	1671	0	0	1649	0
Flt Permitted	0.950			0.950				0.974			0.986	
Satd. Flow (perm)	1719	1788	0	1719	1766	0	0	1671	0	0	1649	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	372	33	22	150	28	39	6	28	11	6	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	405	0	22	178	0	0	73	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	335	30	20	135	25	35	5	25	10	5	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	372	33	22	150	28	39	6	28	11	6	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	183			411			663	666	399	666	668	174
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183			411			663	666	399	666	668	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			89	98	96	97	98	97
cM capacity (veh/h)	1369			1128			342	360	639	335	359	855

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	406	22	178	72	39
Volume Left	22	0	22	0	39	11
Volume Right	0	33	0	28	28	22
cSH	1369	1700	1128	1700	418	521
Volume to Capacity	0.02	0.24	0.02	0.10	0.17	0.07
Queue Length 95th (ft)	1	0	2	0	15	6
Control Delay (s)	7.7	0.0	8.3	0.0	15.4	12.5
Lane LOS	A		A		C	B
Approach Delay (s)	0.4		0.9		15.4	12.5
Approach LOS					C	B

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	205	100	300	110	1	50	115	70	1	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963						0.960			0.993	
Flt Protected		0.992			0.965			0.989				
Satd. Flow (prot)	0	1729	0	0	1746	0	0	1718	0	0	1797	0
Flt Permitted		0.992			0.965			0.989				
Satd. Flow (perm)	0	1729	0	0	1746	0	0	1718	0	0	1797	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	61	228	111	333	122	1	56	128	78	1	528	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	400	0	0	456	0	0	262	0	0	557	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	205	100	300	110	1	50	115	70	1	475	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	61	228	111	333	122	1	56	128	78	1	528	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	894	871	552	1057	846	177	561			211		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	894	871	552	1057	846	177	561			211		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	15	79	0	56	100	94			100		
cM capacity (veh/h)	160	268	523	42	277	852	992			1337		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	400	457	261	557
Volume Left	61	333	56	1
Volume Right	111	1	78	28
cSH	277	55	992	1337
Volume to Capacity	1.44	8.32	0.06	0.00
Queue Length 95th (ft)	554	Err	4	0
Control Delay (s)	253.9	Err	2.3	0.0
Lane LOS	F	F	A	A
Approach Delay (s)	253.9	Err	2.3	0.0
Approach LOS	F	F		

Intersection Summary				
Average Delay	2788.0			
Intersection Capacity Utilization	95.7%	ICU Level of Service	F	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	75	80	285	35	225	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	83	89	317	39	250	1028
Shared Lane Traffic (%)						
Lane Group Flow (vph)	83	89	317	39	250	1028
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	80	285	35	225	925
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	89	317	39	250	1028
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1854	327			361	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1854	327			361	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			79	
cM capacity (veh/h)	62	702			1177	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	317	39	250	1028
Volume Left	83	0	0	0	250	0
Volume Right	0	89	0	39	0	0
cSH	62	702	1700	1700	1177	1700
Volume to Capacity	1.34	0.13	0.19	0.02	0.21	0.60
Queue Length 95th (ft)	177	11	0	0	20	0
Control Delay (s)	340.6	10.9	0.0	0.0	8.9	0.0
Lane LOS	F	B			A	
Approach Delay (s)	170.4		0.0		1.7	
Approach LOS	F					

Intersection Summary				
Average Delay		17.5		
Intersection Capacity Utilization		60.9%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	195	5	20	195	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.884	
Flt Protected				0.995	0.993	
Satd. Flow (prot)	1802	0	0	1800	1588	0
Flt Permitted				0.995	0.993	
Satd. Flow (perm)	1802	0	0	1800	1588	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	217	6	22	217	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	239	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	195	5	20	195	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	217	6	22	217	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			222		481	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			222		481	219
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1329		530	813

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	222	239	7
Volume Left	0	22	1
Volume Right	6	0	6
cSH	1700	1329	746
Volume to Capacity	0.13	0.02	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.9	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.9
Approach LOS			A

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		35.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	60	110	5	45	60	50	145	1	125	630	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.926			0.926			0.999			0.982	
Flt Protected		0.993			0.998			0.987			0.993	
Satd. Flow (prot)	0	1664	0	0	1672	0	0	1784	0	0	1765	0
Flt Permitted		0.993			0.998			0.987			0.993	
Satd. Flow (perm)	0	1664	0	0	1672	0	0	1784	0	0	1765	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	33	67	122	6	50	67	56	161	1	139	700	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	222	0	0	123	0	0	218	0	0	972	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	60	110	5	45	60	50	145	1	125	630	120
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	67	122	6	50	67	56	161	1	139	700	133
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1419	1328	777	1483	1394	172	838			167		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1419	1328	777	1483	1394	172	838			167		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	44	47	69	84	57	92	93			90		
cM capacity (veh/h)	60	127	389	36	116	857	780			1387		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	222	122	218	972
Volume Left	33	6	56	139
Volume Right	122	67	1	133
cSH	159	183	780	1387
Volume to Capacity	1.40	0.67	0.07	0.10
Queue Length 95th (ft)	347	99	6	8
Control Delay (s)	265.8	56.9	3.1	2.5
Lane LOS	F	F	A	A
Approach Delay (s)	265.8	56.9	3.1	2.5
Approach LOS	F	F		

Intersection Summary				
Average Delay		45.0		
Intersection Capacity Utilization		79.9%	ICU Level of Service	D
Analysis Period (min)		15		

```
*******************************************************************************
*                                                                             *
*   9:1:09            2025 BUILD - CHERYL/NEW LACY-NO IMP.                25  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  90.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   80  345    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  725   40    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000 1030    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     425    765   1030              * AVEDEL  s  81.7 *
* CAPACITY    veh    1373    848   1010              * LOS   SIG     F *
* AVE DELAY  mins    0.06   0.92   2.23              * LOS UNSIG     F *
* MAX DELAY  mins    0.08   1.87   4.44              *                        *
* AVE QUEUE   veh       0     12     45              * VEHIC HRS  50.4 *
* MAX QUEUE   veh       1     24     74              * COST    $   756 *
*                                                    *                        *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09            2025 BUILD - CHERYL/NEW LACY-NO IMP.                26  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  90.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   45  725    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  865   60    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  595    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     770    925    595              * AVEDEL  s 237.5 *
* CAPACITY    veh    1658    646   1009              * LOS   SIG     F *
* AVE DELAY  mins    0.07   9.65   0.14              * LOS UNSIG     F *
* MAX DELAY  mins    0.10  19.74   0.20              *                        *
* AVE QUEUE   veh       1    184      1              * VEHIC HRS 151.0 *
* MAX QUEUE   veh       1    288      2              * COST    $  2266 *
*                                                    *                        *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09            2025 BUILD - CHERYL/NEW LACY-NO IMP.                27  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  90.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   80  345    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  725   40    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000 1030    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     425    765   1030              * AVEDEL  s  16.5 *
* CAPACITY    veh    1532   1045   1207              * LOS   SIG     B *
* AVE DELAY  mins    0.05   0.23   0.40              * LOS UNSIG     C *
* MAX DELAY  mins    0.07   0.37   0.74              *                        *
* AVE QUEUE   veh       0      3      7              * VEHIC HRS  10.2 *
* MAX QUEUE   veh       0      4     12              * COST    $   153 *
*                                                    *                        *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09            2025 BUILD - CHERYL/NEW LACY-NO IMP.                28  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  90.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   45  725    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  865   60    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  595    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     770    925    595              * AVEDEL  s  98.8 *
* CAPACITY    veh    1856    844   1200              * LOS   SIG     F *
* AVE DELAY  mins    0.05   3.97   0.10              * LOS UNSIG     F *
* MAX DELAY  mins    0.08   8.04   0.13              *                        *
* AVE QUEUE   veh       1     74      1              * VEHIC HRS  62.8 *
* MAX QUEUE   veh       1    117      1              * COST    $   942 *
*                                                    *                        *
*******************************************************************************
```

APPENDIX C

Year 2035 Build Traffic Peak Hour Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	330	15	1135	325	645	705	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	0.99		1.00	1.00	
Frt		0.980				0.850		0.967			0.994	
Flt Protected		0.965			0.955		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1728	1538	1719	3306	0	1719	3414	0
Flt Permitted		0.717			0.656		0.344			0.090		
Satd. Flow (perm)	0	1263	0	0	1183	1510	621	3306	0	163	3414	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	28	33	100	6	183	17	1261	361	717	783	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	106	183	17	1622	0	717	816	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

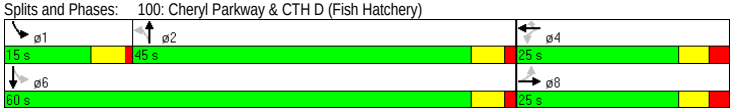
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.85			0.42	0.57	0.06	1.04		2.45	0.37	
Control Delay		60.4			34.2	37.2	13.3	58.5		680.0	7.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		60.4			34.2	37.2	13.3	58.5		680.0	7.5	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Max		Max	Hold	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
70th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
50th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
30th %ile Green (s)	18.9	18.9		18.9	18.9	18.9	39.5	39.5		10.0	54.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
10th %ile Green (s)	13.7	13.7		13.7	13.7	13.7	39.5	39.5		10.0	54.5	
10th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
Queue Length 50th (ft)		116			48	87	5	~505		~606	95	
Queue Length 95th (ft)		#236			97	153	17	#640		#821	128	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		286			268	342	293	1557		293	2219	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.80			0.40	0.54	0.06	1.04		2.45	0.37	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 83.9	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 85	
50th %ile Actuated Cycle: 85	
30th %ile Actuated Cycle: 84.9	
10th %ile Actuated Cycle: 79.7	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Copy of Analysis\5. 2035 Build\AM.syn Synchro 7 - Report
Traffic Analysis & Design, Inc.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	330	15	1135	325	645	705	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1721	1509	1716	3305		1719	3414	
Flt Permitted		0.72			0.66	1.00	0.34	1.00		0.09	1.00	
Satd. Flow (perm)		1263			1182	1509	621	3305		163	3414	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	167	28	33	100	6	183	17	1261	361	717	783	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	228	0	0	106	183	17	1622	0	717	816	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		17.9			17.9	17.9	39.5	39.5		54.5	54.5	
Effective Green, g (s)		17.9			17.9	17.9	39.5	39.5		54.5	54.5	
Actuated g/C Ratio		0.21			0.21	0.21	0.47	0.47		0.65	0.65	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		269			252	322	292	1556		291	2218	
v/s Ratio Prot								0.49		c0.29	0.24	
v/s Ratio Perm		c0.18			0.09	0.12	0.03			c1.31		
v/c Ratio		0.85			0.42	0.57	0.06	1.04		2.46	0.37	
Uniform Delay, d1		31.7			28.5	29.5	12.1	22.2		26.0	6.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.6			1.3	2.5	0.1	34.7		669.0	0.1	
Delay (s)		53.3			29.9	32.0	12.2	56.9		695.0	6.9	
Level of Service		D			C	C	B	E		F	A	
Approach Delay (s)		53.3			31.2			56.5			328.8	
Approach LOS		D			C			E			F	

Intersection Summary					
HCM Average Control Delay	167.4	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.97				
Actuated Cycle Length (s)	83.9	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	109.6%	ICU Level of Service		H	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	650	70	5	265	30	40	25	20	15	5	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.987			0.968			0.920	
Flt Protected		0.992			0.999			0.977			0.985	
Satd. Flow (prot)	0	1775	0	0	1784	0	0	1711	0	0	1640	0
Flt Permitted		0.992			0.999			0.977			0.985	
Satd. Flow (perm)	0	1775	0	0	1784	0	0	1711	0	0	1640	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	722	78	6	294	33	44	28	22	17	6	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	961	0	0	333	0	0	94	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	650	70	5	265	30	40	25	20	15	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	722	78	6	294	33	44	28	22	17	6	33
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.77			0.77	0.77	0.77	0.77	0.77	
vC, conflicting volume	333			805			1452	1432	771	1452	1454	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			593			1437	1412	549	1437	1441	321
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			99			34	69	94	69	93	95
cM capacity (veh/h)	1205			739			67	89	403	53	85	707

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	961	333	94	56
Volume Left	161	6	44	17
Volume Right	78	33	22	33
cSH	1205	739	91	131
Volume to Capacity	0.13	0.01	1.03	0.43
Queue Length 95th (ft)	12	1	153	46
Control Delay (s)	3.2	0.3	187.1	51.6
Lane LOS	A	A	F	F
Approach Delay (s)	3.2	0.3	187.1	51.6
Approach LOS			F	F

Intersection Summary				
Average Delay	16.4			
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	165	5	80	700	160	25	275	295	65	160	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.977			0.933				0.850
Flt Protected		0.983			0.996			0.998			0.986	
Satd. Flow (prot)	0	1779	1538	0	1761	0	0	1685	0	0	1784	1538
Flt Permitted		0.983			0.996			0.998			0.986	
Satd. Flow (perm)	0	1779	1538	0	1761	0	0	1685	0	0	1784	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	100	183	6	89	778	178	28	306	328	72	178	367
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	6	0	1045	0	0	662	0	0	250	367
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	165	5	80	700	160	25	275	295	65	160	330
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	100	183	6	89	778	178	28	306	328	72	178	367
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1424	1021	188	954	1224	479	549			638		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1424	1021	188	954	1224	479	549			638		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	12	99	0	0	69	97			92		
cM capacity (veh/h)	0	208	840	53	157	575	1001			927		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	283	6	1044	661	250	367
Volume Left	100	0	89	28	72	0
Volume Right	0	6	178	328	0	367
cSH	0	840	150	1001	927	1700
Volume to Capacity	Err	0.01	6.95	0.03	0.08	0.22
Queue Length 95th (ft)	Err	0	Err	2	6	0
Control Delay (s)	Err	9.3	Err	0.7	3.2	0.0
Lane LOS	F	A	F	A	A	
Approach Delay (s)	Err		Err	0.7	1.3	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	124.5%	ICU Level of Service	H	
Analysis Period (min)	15			

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

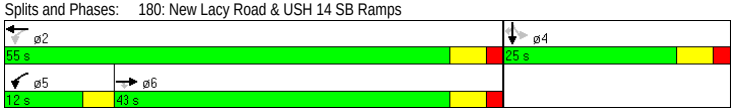
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	190	175	865	0	0	0	0	470	1	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.952	
Satd. Flow (prot)	0	4940	1538	1719	3438	0	0	0	0	0	1723	2707
Flt Permitted				0.146							0.952	
Satd. Flow (perm)	0	4940	1538	264	3438	0	0	0	0	0	1723	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1233	106	194	961	0	0	0	0	522	1	1057
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1233	106	194	961	0	0	0	0	0	523	1057
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.56	0.16	0.64	0.48						1.14	1.46
Control Delay		17.5	13.4	12.2	6.5						116.7	242.7
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		17.5	13.4	12.2	6.5						116.7	242.7
90th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
50th %ile Green (s)		37.4	37.4	8.1	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		35.4	35.4	7.3	46.2					21.8	21.8	21.8
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		30.4	30.4	6.1	40.0					28.0	28.0	28.0
10th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
Queue Length 50th (ft)		152	29	19	90						~336	~441
Queue Length 95th (ft)		194	58	m7	m232						#521	#571
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2290	713	317	2106						460	723
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.54	0.15	0.61	0.46						1.14	1.46

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	190	175	865	0	0	0	0	470	1	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4940	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.15	1.00						0.95	1.00
Satd. Flow (perm)		4940	1538	265	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1233	106	194	961	0	0	0	0	522	1	1057
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1233	106	194	961	0	0	0	0	0	523	1057
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		35.4	35.4	46.6	46.6						21.4	21.4
Effective Green, g (s)		35.4	35.4	46.6	46.6						21.4	21.4
Actuated g/C Ratio		0.44	0.44	0.58	0.58						0.27	0.27
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2186	681	294	2003						461	724
v/s Ratio Prot		0.25		c0.06	0.28							
v/s Ratio Perm			0.07	c0.32							0.30	c0.39
v/c Ratio		0.56	0.16	0.66	0.48						1.13	1.46
Uniform Delay, d1		16.6	13.4	9.8	9.7						29.3	29.3
Progression Factor		1.00	1.00	0.94	0.64						1.00	1.00
Incremental Delay, d2		1.1	0.5	1.9	0.4						84.2	214.6
Delay (s)		17.6	13.8	11.1	6.6						113.5	243.9
Level of Service		B	B	B	A						F	F
Approach Delay (s)		17.3			7.4			0.0			200.7	
Approach LOS		B			A			A			F	

Intersection Summary				
HCM Average Control Delay	85.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	91.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	800	780	0	0	790	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	889	867	0	0	878	244	278	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	889	867	0	0	878	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

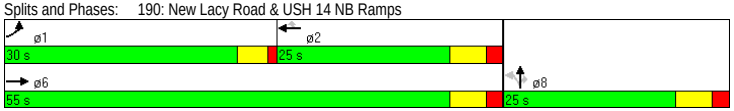
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.89	0.74			0.88	0.55		0.80	0.28			
Control Delay	20.9	14.3			41.3	31.5		47.8	28.2			
Queue Delay	0.0	0.1			0.0	0.0		0.0	0.0			
Total Delay	20.9	14.4			41.3	31.5		47.8	28.2			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
70th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	25.7	50.7			20.5	20.5	17.3	17.3	17.3			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	23.5	53.3			25.3	25.3	14.7	14.7	14.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	20.1	57.2			32.6	32.6	10.8	10.8	10.8			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	207	265			231	108		131	36			
Queue Length 95th (ft)	#287	m285			#376	#195		#215	73			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1065	1173			1001	447		409	365			
Starvation Cap Reductn	0	16			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.83	0.75			0.88	0.55		0.68	0.24			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	800	780	0	0	790	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	889	867	0	0	878	244	278	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	889	867	0	0	878	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	24.1	51.8			23.2	23.2		16.2	16.2			
Effective Green, g (s)	24.1	51.8			23.2	23.2		16.2	16.2			
Actuated g/C Ratio	0.30	0.65			0.29	0.29		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1005	1172			997	446		349	311			
v/s Ratio Prot	c0.27	0.48			c0.26							
v/s Ratio Perm						0.16		0.16	0.06			
v/c Ratio	0.88	0.74			0.88	0.55		0.80	0.28			
Uniform Delay, d1	26.6	9.5			27.1	24.0		30.4	26.9			
Progression Factor	0.38	1.12			1.00	1.00		1.00	1.00			
Incremental Delay, d2	8.0	1.8			11.0	4.8		11.3	0.2			
Delay (s)	18.1	12.5			38.1	28.7		41.7	27.1			
Level of Service	B	B			D	C		D	C			
Approach Delay (s)		15.3			36.1			38.2			0.0	
Approach LOS		B			D			D			A	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	430	210	45	190	225	140	855	125	160	505	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99		1.00		0.98	1.00	1.00	
Frt		0.951			0.919				0.850		0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1712	0	1719	1645	0	1719	3438	1538	1719	3342	0
Flt Permitted	0.178			0.237			0.398			0.136		
Satd. Flow (perm)	322	1712	0	428	1645	0	717	3438	1511	246	3342	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	372	478	233	50	211	250	156	950	69	178	561	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	372	711	0	50	461	0	156	950	69	178	667	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.95	0.98		0.57	1.37		0.80	1.02	0.17	0.64	0.45	
Control Delay	57.3	55.5		61.7	215.5		62.9	68.7	27.6	27.2	18.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	57.3	55.5		61.7	215.5		62.9	68.7	27.6	27.2	18.7	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Max	Hold	
70th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	11.8	41.3	
70th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	10.2	39.7	
50th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	8.7	38.2	
30th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	6.7	36.2	
10th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	154	386		26	~350		83	~293	30	61	135	
Queue Length 95th (ft)	#356	#678		#86	#569		#204	#461	68	112	181	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	393	729		87	337		194	932	409	354	1645	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.95	0.98		0.57	1.37		0.80	1.02	0.17	0.50	0.41	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 90.5	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 95	
70th %ile Actuated Cycle: 91.8	
50th %ile Actuated Cycle: 90.2	
30th %ile Actuated Cycle: 88.7	
10th %ile Actuated Cycle: 86.7	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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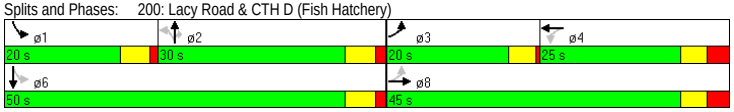
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	430	210	45	190	225	140	855	125	160	505	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1706		1713	1645		1713	3438	1511	1719	3343	
Flt Permitted	0.18	1.00		0.24	1.00		0.40	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	322	1706		428	1645		718	3438	1511	245	3343	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	372	478	233	50	211	250	156	950	69	178	561	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	372	711	0	50	461	0	156	950	69	178	667	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	39.9	39.9	
Effective Green, g (s)	38.5	38.5		18.5	18.5		24.5	24.5	24.5	39.9	39.9	
Actuated g/C Ratio	0.43	0.43		0.20	0.20		0.27	0.27	0.27	0.44	0.44	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	384	727		88	337		195	932	410	278	1476	
v/s Ratio Prot	0.17	c0.42			c0.28			c0.28		c0.07	0.20	
v/s Ratio Perm	0.24			0.12			0.22		0.05	0.21		
v/c Ratio	0.97	0.98		0.57	1.37		0.80	1.02	0.17	0.64	0.45	
Uniform Delay, d1	23.6	25.5		32.4	36.0		30.7	33.0	25.2	19.6	17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	37.1	27.7		9.8	183.5		21.5	34.4	0.3	3.7	0.3	
Delay (s)	60.7	53.3		42.2	219.4		52.1	67.4	25.4	23.3	17.9	
Level of Service	E	D		D	F		D	E	C	C	B	
Approach Delay (s)		55.8			202.1			62.9			19.1	
Approach LOS		E			F			E			B	

Intersection Summary					
HCM Average Control Delay	70.2	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.11				
Actuated Cycle Length (s)	90.4	Sum of lost time (s)		23.5	
Intersection Capacity Utilization	96.0%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	360	235	190	300	25	140	70	70	10	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.988			0.966			0.966	
Flt Protected		0.986		0.950				0.976			0.988	
Satd. Flow (prot)	0	1784	1538	1719	1788	0	0	1706	0	0	1727	0
Flt Permitted		0.986		0.950				0.976			0.988	
Satd. Flow (perm)	0	1784	1538	1719	1788	0	0	1706	0	0	1727	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	400	261	211	333	28	156	78	78	11	22	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	561	261	211	361	0	0	312	0	0	44	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	360	235	190	300	25	140	70	70	10	20	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	400	261	211	333	28	156	78	78	11	22	11
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	366			666			1510	1516	410	1618	1763	357
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			666			1510	1516	410	1618	1763	357
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			77			0	0	88	0	59	98
cM capacity (veh/h)	1171			905			48	77	630	0	54	675

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	561	261	211	361	311	44
Volume Left	161	0	211	0	156	11
Volume Right	0	261	0	28	78	11
cSH	1171	1700	905	1700	72	0
Volume to Capacity	0.14	0.15	0.23	0.21	4.34	Err
Queue Length 95th (ft)	12	0	23	0	Err	Err
Control Delay (s)	3.6	0.0	10.2	0.0	Err	Err
Lane LOS	A		B		F	F
Approach Delay (s)	2.4		3.8		Err	Err
Approach LOS					F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	305	30	25	365	15	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.876	
Flt Protected			0.950		0.996	
Satd. Flow (prot)	1810	1538	1719	1810	1579	0
Flt Permitted			0.950		0.996	
Satd. Flow (perm)	1810	1538	1719	1810	1579	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	339	33	28	406	17	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	339	33	28	406	200	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	305	30	25	365	15	165
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	339	33	28	406	17	183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			372		800	339
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			372		800	339
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	74
cM capacity (veh/h)			1170		342	697

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	339	33	28	406	200
Volume Left	0	0	28	0	17
Volume Right	0	33	0	0	183
cSH	1700	1700	1170	1700	641
Volume to Capacity	0.20	0.02	0.02	0.24	0.31
Queue Length 95th (ft)	0	0	2	0	33
Control Delay (s)	0.0	0.0	8.2	0.0	13.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.5		13.1
Approach LOS					B

Intersection Summary				
Average Delay		2.8		
Intersection Capacity Utilization		38.5%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	445	5	30	530	1	1	1	20	1	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.876			0.879	
Flt Protected		0.998			0.997			0.998			0.997	
Satd. Flow (prot)	0	1806	1538	0	1804	0	0	1582	0	0	1586	0
Flt Permitted		0.998			0.997			0.998			0.997	
Satd. Flow (perm)	0	1806	1538	0	1804	0	0	1582	0	0	1586	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	494	6	33	589	1	1	1	22	1	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	511	6	0	623	0	0	24	0	0	19	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	445	5	30	530	1	1	1	20	1	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	494	6	33	589	1	1	1	22	1	1	17
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	590			505			1211	1189	504	1212	1194	594
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590			505			1211	1189	504	1212	1194	594
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			99	99	96	99	99	97
cM capacity (veh/h)	971			1040			144	176	557	143	174	497

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	511	6	623	24	19
Volume Left	17	0	33	1	1
Volume Right	0	6	1	22	17
cSH	971	1700	1040	453	396
Volume to Capacity	0.02	0.00	0.03	0.05	0.05
Queue Length 95th (ft)	1	0	2	4	4
Control Delay (s)	0.5	0.0	0.9	13.4	14.5
Lane LOS	A		A	B	B
Approach Delay (s)	0.5		0.9	13.4	14.5
Approach LOS				B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	64.0%	ICU Level of Service		C
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	435	20	45	535	30	15	1	45	25	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		125	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994				0.850		0.901			0.928	
Flt Protected		0.998			0.996			0.988			0.978	
Satd. Flow (prot)	0	1795	0	0	1802	1538	0	1611	0	0	1642	0
Flt Permitted		0.998			0.996			0.988			0.978	
Satd. Flow (perm)	0	1795	0	0	1802	1538	0	1611	0	0	1642	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	483	22	50	594	33	17	1	50	28	1	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	522	0	0	644	33	0	68	0	0	62	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	435	20	45	535	30	15	1	45	25	1	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	483	22	50	594	33	17	1	50	28	1	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	628			506			1256	1256	494	1273	1233	594
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	628			506			1256	1256	494	1273	1233	594
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			87	99	91	77	99	93
cM capacity (veh/h)	940			1044			129	158	569	123	163	499

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	522	644	33	68	62
Volume Left	17	50	0	17	28
Volume Right	22	0	33	50	33
cSH	940	1044	1700	302	207
Volume to Capacity	0.02	0.05	0.02	0.22	0.30
Queue Length 95th (ft)	1	4	0	21	30
Control Delay (s)	0.5	1.3	0.0	20.3	29.6
Lane LOS	A	A		C	D
Approach Delay (s)	0.5	1.2		20.3	29.6
Approach LOS				C	D

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	60.4%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	335	10	55	485	55	40	380	180	40	120	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.988			0.959			0.953	
Flt Protected		0.984			0.995			0.997			0.992	
Satd. Flow (prot)	0	1775	0	0	1779	0	0	1730	0	0	1711	0
Flt Permitted		0.984			0.995			0.997			0.992	
Satd. Flow (perm)	0	1775	0	0	1779	0	0	1730	0	0	1711	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	178	372	11	61	539	61	44	422	200	44	133	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	561	0	0	661	0	0	666	0	0	271	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	160	335	10	55	485	55	40	380	180	40	120	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	178	372	11	61	539	61	44	422	200	44	133	94
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1221	991	191	1088	938	532	233			627		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1221	991	191	1088	938	532	233			627		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	99	0	0	89	97			95		
cM capacity (veh/h)	0	222	837	0	239	537	1312			936		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	561	661	667	272
Volume Left	178	61	44	44
Volume Right	11	61	200	94
cSH	0	0	1312	936
Volume to Capacity	Err	Err	0.03	0.05
Queue Length 95th (ft)	Err	Err	3	4
Control Delay (s)	Err	Err	0.9	1.9
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	0.9	1.9
Approach LOS	F	F		

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	335	120	130	380	75	25	380	50	185	575	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.983			0.985				0.850
Flt Protected		0.991			0.989			0.997			0.988	
Satd. Flow (prot)	0	1741	0	0	1759	0	0	1777	0	0	1788	1538
Flt Permitted		0.991			0.989			0.997			0.988	
Satd. Flow (perm)	0	1741	0	0	1759	0	0	1777	0	0	1788	1538
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		753			1231			1544			431	
Travel Time (s)		14.7			24.0			30.1			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	111	372	133	144	422	83	28	422	56	206	639	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	649	0	0	506	0	0	845	211
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	100	335	120	130	380	75	25	380	50	185	575	190
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	111	372	133	144	422	83	28	422	56	206	639	211
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	511			511			1743	1466	449	1691	1491	474
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511			511			1743	1466	449	1691	1491	474
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			86			0	0	91	0	0	64
cM capacity (veh/h)	1035			1035			0	96	599	0	93	580

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	617	650	506	844	211
Volume Left	111	144	28	206	0
Volume Right	133	83	56	0	211
cSH	1035	1035	0	0	580
Volume to Capacity	0.11	0.14	Err	Err	0.36
Queue Length 95th (ft)	9	12	Err	Err	41
Control Delay (s)	2.7	3.4	Err	Err	14.7
Lane LOS	A	A	F	F	B
Approach Delay (s)	2.7	3.4	Err	Err	
Approach LOS			F	F	

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		120.9%	ICU Level of Service	H
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	115	10	195	10	1065	350	550	235	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.960			0.956		0.950			0.950		
Satd. Flow (prot)	0	1737	1538	0	1730	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.960			0.956		0.950			0.950		
Satd. Flow (perm)	0	1737	1538	0	1730	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	17	128	11	217	11	1183	389	611	261	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	17	0	139	217	11	1183	389	611	261	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	10	15	115	10	195	10	1065	350	550	235	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	11	17	128	11	217	11	1183	389	611	261	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2921	3088	271	2721	2721	1193	288			1577		
vC1, stage 1 conf vol	1488	1488		1211	1211							
vC2, stage 2 conf vol	1433	1599		1511	1511							
vCu, unblocked vol	2921	3088	271	2721	2721	1193	288			1577		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	98	0	0	3	99			0		
cM capacity (veh/h)	0	0	754	0	0	222	1251			407		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	67	17	139	217	11	1183	389	611	261	22
Volume Left	56	0	128	0	11	0	0	611	0	0
Volume Right	0	17	0	217	0	0	389	0	0	22
cSH	0	754	0	222	1251	1700	1700	407	1700	1700
Volume to Capacity	Err	0.02	Err	0.97	0.01	0.70	0.23	1.50	0.15	0.01
Queue Length 95th (ft)	Err	2	Err	216	1	0	0	813	0	0
Control Delay (s)	Err	9.9	Err	99.7	7.9	0.0	0.0	263.1	0.0	0.0
Lane LOS	F	A	F	F	A			F		
Approach Delay (s)	Err		Err		0.1			179.7		
Approach LOS	F		F							

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	110.1%	ICU Level of Service	H	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	565	260	25	225	1	70	5	35	15	30	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.999			0.957			0.966	
Flt Protected	0.950			0.950				0.969			0.987	
Satd. Flow (prot)	1719	1724	0	1719	1808	0	0	1678	0	0	1725	0
Flt Permitted	0.950			0.950				0.969			0.987	
Satd. Flow (perm)	1719	1724	0	1719	1808	0	0	1678	0	0	1725	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	67	628	289	28	250	1	78	6	39	17	33	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	917	0	28	251	0	0	123	0	0	67	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	565	260	25	225	1	70	5	35	15	30	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	67	628	289	28	250	1	78	6	39	17	33	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	256			922			1254	1222	782	1119	1366	261
vC1, stage 1 conf vol							911	911		311	311	
vC2, stage 2 conf vol							344	312		808	1055	
vCu, unblocked vol	256			922			1254	1222	782	1119	1366	261
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			96			72	98	90	94	86	98
cM capacity (veh/h)	1286			726			276	303	386	268	243	764

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	67	917	28	251	122	67
Volume Left	67	0	28	0	78	17
Volume Right	0	289	0	1	39	17
cSH	1286	1700	726	1700	305	301
Volume to Capacity	0.05	0.54	0.04	0.15	0.40	0.22
Queue Length 95th (ft)	4	0	3	0	46	21
Control Delay (s)	8.0	0.0	10.2	0.0	24.5	20.3
Lane LOS	A		B		C	C
Approach Delay (s)	0.5		1.0		24.5	20.3
Approach LOS					C	C

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	69.7%	ICU Level of Service		C
Analysis Period (min)	15			

Volume
320: Nobel Drive & Mica Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	110	220	195	155	130	40	10	40	30	35	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.900			0.932			0.940			0.962	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1719	1629	0	1719	1686	0	0	1664	0	0	1713	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1719	1629	0	1719	1686	0	0	1664	0	0	1713	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	122	244	217	172	144	44	11	44	33	39	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	366	0	217	316	0	0	99	0	0	100	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	110	220	195	155	130	40	10	40	30	35	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	122	244	217	172	144	44	11	44	33	39	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	317			367			1219	1317	244	1172	1367	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			367			1219	1317	244	1172	1367	244
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			82			46	90	94	71	62	96
cM capacity (veh/h)	1227			1176			83	110	787	113	103	787

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	161	367	217	317	100	100
Volume Left	161	0	217	0	44	33
Volume Right	0	244	0	144	44	28
cSH	1227	1700	1176	1700	144	141
Volume to Capacity	0.13	0.22	0.18	0.19	0.69	0.71
Queue Length 95th (ft)	11	0	17	0	99	102
Control Delay (s)	8.4	0.0	8.8	0.0	72.8	76.5
Lane LOS	A		A		F	F
Approach Delay (s)	2.6		3.6		72.8	76.5
Approach LOS					F	F

Intersection Summary				
Average Delay	14.4			
Intersection Capacity Utilization	47.8%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	155	15	120	400	1	25	15	55	10	30	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987						0.922			0.922	
Flt Protected	0.950			0.950				0.987			0.995	
Satd. Flow (prot)	1719	1786	0	1719	1810	0	0	1647	0	0	1660	0
Flt Permitted	0.950			0.950				0.987			0.995	
Satd. Flow (perm)	1719	1786	0	1719	1810	0	0	1647	0	0	1660	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	172	17	133	444	1	28	17	61	11	33	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	189	0	133	445	0	0	106	0	0	105	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	155	15	120	400	1	25	15	55	10	30	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	172	17	133	444	1	28	17	61	11	33	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			194			1002	925	191	986	933	455
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			194			1002	925	191	986	933	455
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			90			82	93	93	94	86	90
cM capacity (veh/h)	1090			1356			158	235	837	178	233	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	189	133	446	106	106
Volume Left	11	0	133	0	28	11
Volume Right	0	17	0	1	61	61
cSH	1090	1700	1356	1700	330	342
Volume to Capacity	0.01	0.11	0.10	0.26	0.32	0.31
Queue Length 95th (ft)	1	0	8	0	34	32
Control Delay (s)	8.3	0.0	7.9	0.0	20.9	20.1
Lane LOS	A		A		C	C
Approach Delay (s)	0.5		1.8		20.9	20.1
Approach LOS					C	C

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	46.0%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	150	55	25	420	10	55	10	45	30	10	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960			0.997			0.945			0.928	
Flt Protected	0.950			0.950				0.976			0.983	
Satd. Flow (prot)	1719	1737	0	1719	1804	0	0	1669	0	0	1651	0
Flt Permitted	0.950			0.950				0.976			0.983	
Satd. Flow (perm)	1719	1737	0	1719	1804	0	0	1669	0	0	1651	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	167	61	28	467	11	61	11	50	33	11	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	228	0	28	478	0	0	122	0	0	94	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	150	55	25	420	10	55	10	45	30	10	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	167	61	28	467	11	61	11	50	33	11	50
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	483			233			818	774	207	793	799	482
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	483			233			818	774	207	793	799	482
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			75	96	94	87	96	91
cM capacity (veh/h)	1060			1312			247	311	819	265	301	573

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	228	28	478	122	94
Volume Left	17	0	28	0	61	33
Volume Right	0	61	0	11	50	50
cSH	1060	1700	1312	1700	356	378
Volume to Capacity	0.02	0.13	0.02	0.28	0.34	0.25
Queue Length 95th (ft)	1	0	2	0	37	24
Control Delay (s)	8.5	0.0	7.8	0.0	20.3	17.7
Lane LOS	A		A		C	C
Approach Delay (s)	0.6		0.4		20.3	17.7
Approach LOS					C	C

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	39.8%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	155	65	225	255	1	120	585	460	1	120	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.964						0.947			0.953	
Flt Protected		0.995			0.977			0.995				
Satd. Flow (prot)	0	1736	0	0	1768	0	0	1705	0	0	1724	0
Flt Permitted		0.995			0.977			0.995				
Satd. Flow (perm)	0	1736	0	0	1768	0	0	1705	0	0	1724	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	172	72	250	283	1	133	650	511	1	133	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	0	0	534	0	0	1294	0	0	206	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	155	65	225	255	1	120	585	460	1	120	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	172	72	250	283	1	133	650	511	1	133	72
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1497	1609	179	1512	1390	916	211			1166		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1497	1609	179	1512	1390	916	211			1166		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	91	0	0	100	90			100		
cM capacity (veh/h)	0	92	849	0	125	323	1337			586		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	272	534	1294	207
Volume Left	28	250	133	1
Volume Right	72	1	511	72
cSH	0	0	1337	586
Volume to Capacity	Err	Err	0.10	0.00
Queue Length 95th (ft)	Err	Err	8	0
Control Delay (s)	Err	Err	3.1	0.1
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	3.1	0.1
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		129.6%	ICU Level of Service	H
Analysis Period (min)		15		

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	245	955	115	60	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	50	272	1061	128	67	267
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	272	1061	128	67	267
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	245	955	115	60	240
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	272	1061	128	67	267
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1471	1071			1194	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1471	1071			1194	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	59	0			88	
cM capacity (veh/h)	121	262			572	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	50	272	1061	128	67	267
Volume Left	50	0	0	0	67	0
Volume Right	0	272	0	128	0	0
cSH	121	262	1700	1700	572	1700
Volume to Capacity	0.41	1.04	0.62	0.08	0.12	0.16
Queue Length 95th (ft)	44	268	0	0	10	0
Control Delay (s)	54.4	107.6	0.0	0.0	12.1	0.0
Lane LOS	F	F			B	
Approach Delay (s)	99.3		0.0		2.4	
Approach LOS	F					

Intersection Summary				
Average Delay		17.8		
Intersection Capacity Utilization		72.6%	ICU Level of Service	C
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	215	1	1	245	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.918	
Flt Protected					0.981	
Satd. Flow (prot)	1808	0	0	1810	1630	0
Flt Permitted					0.981	
Satd. Flow (perm)	1808	0	0	1810	1630	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	239	1	1	272	11	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	240	0	0	273	28	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	215	1	1	245	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	239	1	1	272	11	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			240		514	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			240		514	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	98
cM capacity (veh/h)			1309		515	792

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	240	273	28
Volume Left	0	1	11
Volume Right	1	0	17
cSH	1700	1309	652
Volume to Capacity	0.14	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		23.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	50	35	10	80	155	110	865	1	60	295	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.915						0.982	
Flt Protected		0.970			0.998			0.994			0.993	
Satd. Flow (prot)	0	1718	0	0	1652	0	0	1799	0	0	1765	0
Flt Permitted		0.970			0.998			0.994			0.993	
Satd. Flow (perm)	0	1718	0	0	1652	0	0	1799	0	0	1765	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	56	39	11	89	172	122	961	1	67	328	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	256	0	0	272	0	0	1084	0	0	456	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	50	35	10	80	155	110	865	1	60	295	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	56	39	11	89	172	122	961	1	67	328	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1924	1708	368	1774	1738	972	394			967		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1924	1708	368	1774	1738	972	394			967		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	22	94	40	0	43	89			90		
cM capacity (veh/h)	0	72	665	19	69	300	1144			697		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	256	272	1084	456
Volume Left	161	11	122	67
Volume Right	39	172	1	61
cSH	0	110	1144	697
Volume to Capacity	Err	2.47	0.11	0.10
Queue Length 95th (ft)	Err	610	9	8
Control Delay (s)	Err	748.1	2.8	2.7
Lane LOS	F	F	A	A
Approach Delay (s)	Err	748.1	2.8	2.7
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		102.0%	ICU Level of Service	G
Analysis Period (min)		15		

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	825	10	785	20	405	1195	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	130		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99	0.98	1.00	1.00		1.00	1.00	
Frt		0.967				0.850		0.996			0.987	
Flt Protected		0.969			0.958		0.950			0.950		
Satd. Flow (prot)	0	1688	0	0	1734	1538	1719	3422	0	1719	3387	0
Flt Permitted		0.611			0.690		0.169			0.166		
Satd. Flow (perm)	0	1062	0	0	1242	1510	306	3422	0	300	3387	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	22	239	33	458	11	872	22	450	1328	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	0	0	272	458	11	894	0	450	1450	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.32			0.84	1.17	0.10	0.69		1.21	0.73	
Control Delay		28.5			53.0	128.5	16.0	22.1		137.0	13.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.5			53.0	128.5	16.0	22.1		137.0	13.6	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Max	Max	Max	Hold	Hold		Max	Max	
70th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	30.3	30.3		10.0	45.3	
70th %ile Term Code	Hold	Hold		Max	Max	Max	Hold	Hold		Max	Gap	
50th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	27.4	27.4		10.0	42.4	
50th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Gap		Max	Hold	
30th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	23.9	23.9		10.0	38.9	
30th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Gap		Max	Hold	
10th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	19.6	19.6		10.0	34.6	
10th %ile Term Code	Hold	Hold		Max	Max	Max	Gap	Gap		Max	Hold	
Queue Length 50th (ft)		32			116	~250	3	174		~187	227	
Queue Length 95th (ft)		85			#299	#506	13	232		#395	296	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			130		
Base Capacity (vph)		276			323	393	165	1850		371	2527	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.32			0.84	1.17	0.07	0.48		1.21	0.57	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 73.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 75.8	
50th %ile Actuated Cycle: 72.9	
30th %ile Actuated Cycle: 69.4	
10th %ile Actuated Cycle: 65.1	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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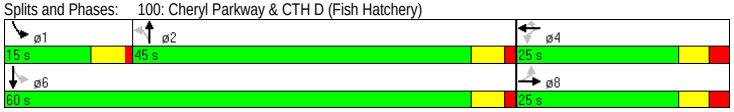
Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	825	10	785	20	405	1195	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1685			1726	1511	1718	3423		1719	3388	
Flt Permitted		0.61			0.69	1.00	0.17	1.00		0.17	1.00	
Satd. Flow (perm)		1061			1242	1511	306	3423		300	3388	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	56	11	22	239	33	458	11	872	22	450	1328	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	89	0	0	272	458	11	894	0	450	1450	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		19.2			19.2	19.2	27.8	27.8		42.9	42.9	
Effective Green, g (s)		19.2			19.2	19.2	27.8	27.8		42.9	42.9	
Actuated g/C Ratio		0.26			0.26	0.26	0.38	0.38		0.58	0.58	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		277			324	394	116	1293		370	1975	
v/s Ratio Prot								0.26		c0.17	0.43	
v/s Ratio Perm		0.08			0.22	c0.30	0.04			c0.54		
v/c Ratio		0.32			0.84	1.16	0.09	0.69		1.22	0.73	
Uniform Delay, d1		21.9			25.7	27.2	14.8	19.3		15.7	11.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			17.5	97.6	0.5	1.7		119.6	1.5	
Delay (s)		22.7			43.2	124.8	15.3	21.0		135.3	12.7	
Level of Service		C			D	F	B	C		F	B	
Approach Delay (s)		22.7			94.4			21.0			41.8	
Approach LOS		C			F			C			D	

Intersection Summary					
HCM Average Control Delay	46.7	HCM Level of Service		D	
HCM Volume to Capacity ratio	1.15				
Actuated Cycle Length (s)	73.6	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	82.4%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	390	35	25	765	15	160	10	15	65	30	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.997			0.989			0.908	
Flt Protected		0.990			0.998			0.959			0.989	
Satd. Flow (prot)	0	1775	0	0	1800	0	0	1716	0	0	1625	0
Flt Permitted		0.990			0.998			0.959			0.989	
Satd. Flow (perm)	0	1775	0	0	1800	0	0	1716	0	0	1625	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	433	39	28	850	17	178	11	17	72	33	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	589	0	0	895	0	0	206	0	0	333	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	390	35	25	765	15	160	10	15	65	30	205
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	433	39	28	850	17	178	11	17	72	33	228
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	872			477			1854	1618	463	1632	1629	868
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	872			318			1910	1637	301	1653	1650	868
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	85			97			0	84	97	0	52	34
cM capacity (veh/h)	758			1056			8	70	628	49	69	344

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	589	894	206	333
Volume Left	117	28	178	72
Volume Right	39	17	17	228
cSH	758	1056	9	127
Volume to Capacity	0.15	0.03	22.52	2.62
Queue Length 95th (ft)	14	2	Err	749
Control Delay (s)	3.9	0.7	Err	807.8
Lane LOS	A	A	F	F
Approach Delay (s)	3.9	0.7	Err	807.8
Approach LOS			F	F

Intersection Summary				
Average Delay	1151.0			
Intersection Capacity Utilization	113.2%	ICU Level of Service	H	
Analysis Period (min)	15			

Volume
160: Cheryl Parkway & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	685	25	370	170	75	5	175	80	185	300	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		125	0		0	0		0	0		225
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.984			0.958				0.850
Flt Protected		0.983			0.971			0.999			0.981	
Satd. Flow (prot)	0	1779	1538	0	1729	0	0	1732	0	0	1775	1538
Flt Permitted		0.983			0.971			0.999			0.981	
Satd. Flow (perm)	0	1779	1538	0	1729	0	0	1732	0	0	1775	1538
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		760			1157			1198			1220	
Travel Time (s)		14.8			22.5			18.2			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	406	761	28	411	189	83	6	194	89	206	333	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1167	28	0	683	0	0	289	0	0	539	106
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
160: Cheryl Parkway & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	365	685	25	370	170	75	5	175	80	185	300	95
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	406	761	28	411	189	83	6	194	89	206	333	106
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1182	1049	343	1413	1110	249	444			288		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1182	1049	343	1413	1110	249	444			288		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	96	0	0	89	99			84		
cM capacity (veh/h)	0	185	687	0	170	776	1096			1251		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	1167	28	683	289	539	106
Volume Left	406	0	411	6	206	0
Volume Right	0	28	83	89	0	106
cSH	0	687	0	1096	1251	1700
Volume to Capacity	Err	0.04	Err	0.01	0.16	0.06
Queue Length 95th (ft)	Err	3	Err	0	15	0
Control Delay (s)	Err	10.5	Err	0.2	4.3	0.0
Lane LOS	F	B	F	A	A	
Approach Delay (s)	Err		Err	0.2	3.6	
Approach LOS	F		F			

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	144.2%	ICU Level of Service	H	
Analysis Period (min)	15			

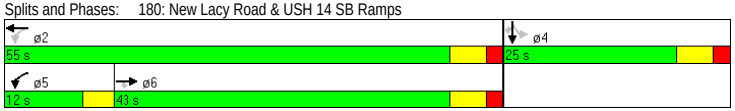
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1765	250	120	515	0	0	0	0	315	1	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		125	225		0	0		0	150		250
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	4940	1538	1719	3438	0	0	0	0	0	1724	2707
Flt Permitted				0.095							0.953	
Satd. Flow (perm)	0	4940	1538	172	3438	0	0	0	0	0	1724	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1961	139	133	572	0	0	0	0	350	1	633
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1961	139	133	572	0	0	0	0	0	351	633
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.83	0.19	0.54	0.27						0.86	0.98
Control Delay		21.9	13.0	15.4	6.8						51.4	64.4
Queue Delay		0.1	0.0	0.0	0.0						0.0	0.0
Total Delay		22.0	13.0	15.4	6.8						51.4	64.4
90th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		37.8	37.8	7.7	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		38.7	38.7	6.8	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		39.4	39.4	6.1	49.0					19.0	19.0	19.0
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
10th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
Queue Length 50th (ft)		291	37	66	106						168	179
Queue Length 95th (ft)		375	74	m89	146						#314	#299
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			125	225								250
Base Capacity (vph)		2376	740	275	2106						409	643
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		33	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.84	0.19	0.48	0.27						0.86	0.98

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



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HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1765	250	120	515	0	0	0	0	315	1	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	0.88
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4940	1538	1719	3438						1724	2707
Flt Permitted		1.00	1.00	0.10	1.00						0.95	1.00
Satd. Flow (perm)		4940	1538	172	3438						1724	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1961	139	133	572	0	0	0	0	350	1	633
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1961	139	133	572	0	0	0	0	0	351	633
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		38.5	38.5	49.0	49.0						19.0	19.0
Effective Green, g (s)		38.5	38.5	49.0	49.0						19.0	19.0
Actuated g/C Ratio		0.48	0.48	0.61	0.61						0.24	0.24
Clearance Time (s)		6.0	6.0	3.5	6.0						6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0						2.0	2.0
Lane Grp Cap (vph)		2377	740	241	2106						409	643
v/s Ratio Prot		c0.40		c0.05	0.17							
v/s Ratio Perm			0.09	0.29							0.20	c0.23
v/c Ratio		0.82	0.19	0.55	0.27						0.86	0.98
Uniform Delay, d1		17.9	11.8	12.2	7.2						29.2	30.4
Progression Factor		1.00	1.00	1.08	0.89						1.00	1.00
Incremental Delay, d2		3.4	0.6	1.2	0.3						15.6	31.3
Delay (s)		21.3	12.4	14.3	6.7						44.8	61.6
Level of Service		C	B	B	A						D	E
Approach Delay (s)		20.7			8.1			0.0			55.6	
Approach LOS		C			A			A			E	

Intersection Summary				
HCM Average Control Delay	27.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1225	855	0	0	470	295	165	1	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		175	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	1810	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1361	950	0	0	522	164	183	1	58	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1361	950	0	0	522	164	0	184	58	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

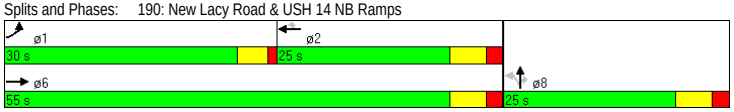
Volume
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	1.02	0.77			0.66	0.47		0.64	0.23			
Control Delay	38.5	10.4			32.6	31.4		41.0	29.7			
Queue Delay	0.0	1.1			0.0	0.0		0.0	0.0			
Total Delay	38.5	11.5			32.6	31.4		41.0	29.7			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	31.6	55.1			19.0	19.0	12.9	12.9	12.9			
50th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	34.0	57.3			18.8	18.8	10.7	10.7	10.7			
30th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	38.0	58.0			15.5	15.5	10.0	10.0	10.0			
10th %ile Term Code	Max	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	~379	81			123	70		87	26			
Queue Length 95th (ft)	#544	m#522			175	128		142	54			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						175			150			
Base Capacity (vph)	1329	1236			817	365		409	365			
Starvation Cap Reductn	0	111			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.02	0.84			0.64	0.45		0.45	0.16			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 45 (56%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1225	855	0	0	470	295	165	1	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	1.00			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	1810			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	1810			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1361	950	0	0	522	164	183	1	58	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1361	950	0	0	522	164	0	184	58	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	31.9	54.6			18.2	18.2		13.4	13.4			
Effective Green, g (s)	31.9	54.6			18.2	18.2		13.4	13.4			
Actuated g/C Ratio	0.40	0.68			0.23	0.23		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1330	1235			782	350		289	258			
v/s Ratio Prot	c0.41	c0.53			0.15							
v/s Ratio Perm						0.11		0.11	0.04			
v/c Ratio	1.02	0.77			0.67	0.47		0.64	0.22			
Uniform Delay, d1	24.1	8.5			28.1	26.7		31.0	28.8			
Progression Factor	0.33	0.73			1.00	1.00		1.00	1.00			
Incremental Delay, d2	24.3	2.4			4.5	4.5		3.4	0.2			
Delay (s)	32.3	8.6			32.6	31.2		34.4	29.0			
Level of Service	C	A			C	C		C	C			
Approach Delay (s)		22.5			32.3			33.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary

HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	235	185	180	505	190	235	545	75	285	885	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	0.99		1.00		0.98	1.00	0.99	
Frt		0.934			0.959				0.850		0.963	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1678	0	1719	1726	0	1719	3438	1538	1719	3291	0
Flt Permitted	0.167			0.487			0.184			0.236		
Satd. Flow (perm)	302	1678	0	878	1726	0	332	3438	1511	427	3291	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	261	206	200	561	211	261	606	42	317	983	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	467	0	200	772	0	261	606	42	317	1300	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.47	0.75		1.01	1.97		2.81	0.63	0.10	0.77	0.80	
Control Delay	23.5	33.0		102.8	469.5		854.2	31.8	26.2	28.7	24.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	23.5	33.0		102.8	469.5		854.2	31.8	26.2	28.7	24.0	
90th %ile Green (s)	11.9	38.5		22.6	22.6		24.5	24.5	24.5	15.0	44.5	
90th %ile Term Code	Gap	Max		Hold	Hold		Max	Max	Max	Max	Max	
70th %ile Green (s)	9.9	35.2		21.3	21.3		24.5	24.5	24.5	15.0	44.5	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Max	Max	Max	Max	
50th %ile Green (s)	8.6	31.1		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
50th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Max	Hold	
30th %ile Green (s)	7.2	29.7		18.5	18.5		24.5	24.5	24.5	12.9	42.4	
30th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	5.5	28.0		18.5	18.5		24.5	24.5	24.5	10.0	39.5	
10th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
Queue Length 50th (ft)	44	227		~125	~685		~249	153	17	99	291	
Queue Length 95th (ft)	80	342		#259	#939		#391	234	46	#221	447	
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	380	741		199	392		93	966	425	435	1679	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.32	0.63		1.01	1.97		2.81	0.63	0.10	0.73	0.77	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 87.6	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 95	
70th %ile Actuated Cycle: 91.7	
50th %ile Actuated Cycle: 87.6	
30th %ile Actuated Cycle: 84.1	
10th %ile Actuated Cycle: 79.5	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

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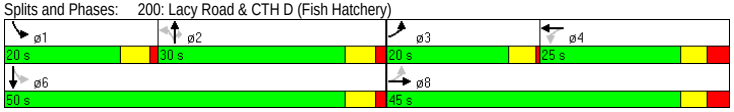
Traffic Analysis & Design, Inc.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	235	185	180	505	190	235	545	75	285	885	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1670		1709	1727		1717	3438	1512	1719	3292	
Flt Permitted	0.17	1.00		0.49	1.00		0.18	1.00	1.00	0.24	1.00	
Satd. Flow (perm)	303	1670		877	1727		333	3438	1512	428	3292	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	122	261	206	200	561	211	261	606	42	317	983	317
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	467	0	200	772	0	261	606	42	317	1300	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	32.4	32.4		19.9	19.9		24.6	24.6	24.6	43.1	43.1	
Effective Green, g (s)	32.4	32.4		19.9	19.9		24.6	24.6	24.6	43.1	43.1	
Actuated g/C Ratio	0.37	0.37		0.23	0.23		0.28	0.28	0.28	0.49	0.49	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	250	618		199	393		94	967	425	410	1622	
v/s Ratio Prot	0.05	c0.28			c0.45			0.18		0.12	c0.39	
v/s Ratio Perm	0.13			0.23			c0.78		0.03	0.26		
v/c Ratio	0.49	0.76		1.01	1.96		2.78	0.63	0.10	0.77	0.80	
Uniform Delay, d1	21.1	24.1		33.8	33.8		31.4	27.4	23.3	15.5	18.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	5.6		65.1	443.1		828.4	1.4	0.1	8.0	3.1	
Delay (s)	21.6	29.7		98.9	476.9		859.8	28.9	23.4	23.5	21.7	
Level of Service	C	C		F	F		F	C	C	C	C	
Approach Delay (s)		28.0			399.1			267.2			22.1	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM Average Control Delay	167.1	HCM Level of Service	F
HCM Volume to Capacity ratio	2.02		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	345	175	50	465	10	235	35	165	20	35	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.997			0.949			0.897	
Flt Protected		0.994		0.950				0.974			0.996	
Satd. Flow (prot)	0	1799	1538	1719	1804	0	0	1673	0	0	1617	0
Flt Permitted		0.994		0.950				0.974			0.996	
Satd. Flow (perm)	0	1799	1538	1719	1804	0	0	1673	0	0	1617	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	383	194	56	517	11	261	39	183	22	39	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	439	194	56	528	0	0	483	0	0	255	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	345	175	50	465	10	235	35	165	20	35	175
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	383	194	56	517	11	261	39	183	22	39	194
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	533			583			1346	1143	393	1341	1332	532
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	533			575			1345	1140	384	1339	1331	532
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			94			0	78	72	67	71	64
cM capacity (veh/h)	1016			971			56	174	646	68	133	537

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	439	194	56	528	483	256
Volume Left	56	0	56	0	261	22
Volume Right	0	194	0	11	183	194
cSH	1016	1700	971	1700	94	261
Volume to Capacity	0.05	0.11	0.06	0.31	5.14	0.98
Queue Length 95th (ft)	4	0	5	0	Err	237
Control Delay (s)	1.6	0.0	8.9	0.0	Err	92.3
Lane LOS	A		A		F	F
Approach Delay (s)	1.1		0.9		Err	92.3
Approach LOS					F	F

Intersection Summary				
Average Delay	2484.0			
Intersection Capacity Utilization	98.6%	ICU Level of Service	F	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	385	20	215	395	25	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.895	
Flt Protected			0.950		0.989	
Satd. Flow (prot)	1810	1538	1719	1810	1602	0
Flt Permitted			0.950		0.989	
Satd. Flow (perm)	1810	1538	1719	1810	1602	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	428	22	239	439	28	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	428	22	239	439	128	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	385	20	215	395	25	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	428	22	239	439	28	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			450		1344	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			450		1344	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		78	84
cM capacity (veh/h)			1095		129	621

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	428	22	239	439	128
Volume Left	0	0	239	0	28
Volume Right	0	22	0	0	100
cSH	1700	1700	1095	1700	339
Volume to Capacity	0.25	0.01	0.22	0.26	0.38
Queue Length 95th (ft)	0	0	21	0	43
Control Delay (s)	0.0	0.0	9.2	0.0	21.9
Lane LOS			A		C
Approach Delay (s)	0.0		3.2		21.9
Approach LOS					C

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		49.1%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	540	5	25	545	1	5	1	25	1	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.892			0.879	
Flt Protected		0.999			0.998			0.992			0.997	
Satd. Flow (prot)	0	1808	1538	0	1806	0	0	1601	0	0	1586	0
Flt Permitted		0.999			0.998			0.992			0.997	
Satd. Flow (perm)	0	1808	1538	0	1806	0	0	1601	0	0	1586	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	600	6	28	606	1	6	1	28	1	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	617	6	0	635	0	0	35	0	0	19	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	540	5	25	545	1	5	1	25	1	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	600	6	28	606	1	6	1	28	1	1	17
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	607			611			1322	1301	610	1328	1306	611
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	607			611			1322	1301	610	1328	1306	611
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			95	99	94	99	99	97
cM capacity (veh/h)	957			950			120	151	485	117	150	486

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	617	6	634	34	19
Volume Left	17	0	28	6	1
Volume Right	0	6	1	28	17
cSH	957	1700	950	311	369
Volume to Capacity	0.02	0.00	0.03	0.11	0.05
Queue Length 95th (ft)	1	0	2	9	4
Control Delay (s)	0.5	0.0	0.8	18.0	15.3
Lane LOS	A		A	C	C
Approach Delay (s)	0.5		0.8	18.0	15.3
Approach LOS				C	C

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	61.1%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	565	25	55	545	30	30	1	55	35	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		125	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994				0.850		0.913			0.939	
Flt Protected		0.998			0.995			0.983			0.974	
Satd. Flow (prot)	0	1795	0	0	1800	1538	0	1624	0	0	1655	0
Flt Permitted		0.998			0.995			0.983			0.974	
Satd. Flow (perm)	0	1795	0	0	1800	1538	0	1624	0	0	1655	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	628	28	61	606	33	33	1	61	39	1	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	678	0	0	667	33	0	95	0	0	73	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	565	25	55	545	30	30	1	55	35	1	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	628	28	61	606	33	33	1	61	39	1	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	639			656			1448	1447	642	1476	1428	606
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	639			656			1448	1447	642	1476	1428	606
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			64	99	87	53	99	93
cM capacity (veh/h)	931			918			93	118	469	83	121	492

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	678	667	33	96	73
Volume Left	22	61	0	33	39
Volume Right	28	0	33	61	33
cSH	931	918	1700	191	134
Volume to Capacity	0.02	0.07	0.02	0.50	0.55
Queue Length 95th (ft)	2	5	0	62	67
Control Delay (s)	0.6	1.7	0.0	41.2	60.3
Lane LOS	A	A		E	F
Approach Delay (s)	0.6	1.6		41.2	60.3
Approach LOS				E	F

Intersection Summary				
Average Delay	6.4			
Intersection Capacity Utilization	65.5%	ICU Level of Service		C
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	520	60	60	355	50	35	135	20	75	380	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.985			0.986			0.953	
Flt Protected		0.994			0.994			0.991			0.995	
Satd. Flow (prot)	0	1777	0	0	1772	0	0	1768	0	0	1716	0
Flt Permitted		0.994			0.994			0.991			0.995	
Satd. Flow (perm)	0	1777	0	0	1772	0	0	1768	0	0	1716	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	578	67	67	394	56	39	150	22	83	422	267
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	728	0	0	517	0	0	211	0	0	772	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	520	60	60	355	50	35	135	20	75	380	240
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	578	67	67	394	56	39	150	22	83	422	267
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1224	982	566	1327	1104	171	694			177		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1224	982	566	1327	1104	171	694			177		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	87	0	0	94	96			94		
cM capacity (veh/h)	0	219	514	0	185	858	884			1375		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	728	517	211	772
Volume Left	83	67	39	83
Volume Right	67	56	22	267
cSH	0	0	884	1375
Volume to Capacity	Err	Err	0.04	0.06
Queue Length 95th (ft)	Err	Err	3	5
Control Delay (s)	Err	Err	2.1	1.5
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	2.1	1.5
Approach LOS	F	F		

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		97.9%	ICU Level of Service	F
Analysis Period (min)		15		

Volume
270: Lacy Road & New Lacy Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	270	45	60	230	175	115	370	125	80	340	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.990			0.949			0.972				0.850
Flt Protected		0.976			0.994			0.991			0.991	
Satd. Flow (prot)	0	1748	0	0	1707	0	0	1743	0	0	1793	1538
Flt Permitted		0.976			0.994			0.991			0.991	
Satd. Flow (perm)	0	1748	0	0	1707	0	0	1743	0	0	1793	1538
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		753			1231			1544			431	
Travel Time (s)		14.7			24.0			30.1			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	333	300	50	67	256	194	128	411	139	89	378	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	683	0	0	517	0	0	678	0	0	467	133
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	300	270	45	60	230	175	115	370	125	80	340	120
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	333	300	50	67	256	194	128	411	139	89	378	133
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	455			355			1677	1585	335	1832	1513	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	455			355			1677	1585	335	1832	1513	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	69			94			0	0	80	0	0	80
cM capacity (veh/h)	1086			1182			0	69	694	0	77	670

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	683	517	678	467	133
Volume Left	333	67	128	89	0
Volume Right	50	194	139	0	133
cSH	1086	1182	0	0	670
Volume to Capacity	0.31	0.06	Err	Err	0.20
Queue Length 95th (ft)	33	4	Err	Err	18
Control Delay (s)	6.7	1.6	Err	Err	11.7
Lane LOS	A	A	F	F	B
Approach Delay (s)	6.7	1.6	Err	Err	
Approach LOS			F	F	

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization		129.1%	ICU Level of Service	H
Analysis Period (min)		15		

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	10	330	10	510	10	375	135	210	1180	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.954		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1726	1538	1719	1810	1538	1719	1810	1538
Flt Permitted		0.954			0.954		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1726	1538	1719	1810	1538	1719	1810	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	11	367	11	567	11	417	150	233	1311	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	11	0	378	567	11	417	150	233	1311	56
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	10	330	10	510	10	375	135	210	1180	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	11	367	11	567	11	417	150	233	1311	56
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2799	2377	1321	2238	2282	427	1372			572		
vC1, stage 1 conf vol	1783	1783		444	444							
vC2, stage 2 conf vol	1016	594		1794	1838							
vCu, unblocked vol	2799	2377	1321	2238	2282	427	1372			572		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	99	94	0	86	8	98			76		
cM capacity (veh/h)	1	92	187	59	80	616	489			982		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	23	11	378	567	11	417	150	233	1311	56
Volume Left	22	0	367	0	11	0	0	233	0	0
Volume Right	0	11	0	567	0	0	150	0	0	56
cSH	1	187	59	616	489	1700	1700	982	1700	1700
Volume to Capacity	33.65	0.06	6.40	0.92	0.02	0.25	0.09	0.24	0.77	0.03
Queue Length 95th (ft)	Err	5	Err	295	2	0	0	23	0	0
Control Delay (s)	Err	25.5	Err	45.1	12.5	0.0	0.0	9.8	0.0	0.0
Lane LOS	F	D	F	E	B			A		
Approach Delay (s)	6781.7		4026.7		0.2			1.4		
Approach LOS	F		F							

Intersection Summary				
Average Delay	1279.5			
Intersection Capacity Utilization	100.9%	ICU Level of Service	G	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	235	70	5	595	15	225	15	10	15	5	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.965			0.996			0.995			0.896	
Flt Protected	0.950			0.950				0.957			0.992	
Satd. Flow (prot)	1719	1746	0	1719	1802	0	0	1723	0	0	1608	0
Flt Permitted	0.950			0.950				0.957			0.992	
Satd. Flow (perm)	1719	1746	0	1719	1802	0	0	1723	0	0	1608	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	33	261	78	6	661	17	250	17	11	17	6	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	339	0	6	678	0	0	278	0	0	101	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	235	70	5	595	15	225	15	10	15	5	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	261	78	6	661	17	250	17	11	17	6	78
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	683			344			1129	1066	310	1038	1096	679
vC1, stage 1 conf vol							372	372		686	686	
vC2, stage 2 conf vol							758	694		352	411	
vCu, unblocked vol	683			344			1129	1066	310	1038	1096	679
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			7	95	98	96	99	82
cM capacity (veh/h)	893			1194			269	365	717	377	380	442

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	339	6	678	278	100
Volume Left	33	0	6	0	250	17
Volume Right	0	78	0	17	11	78
cSH	893	1700	1194	1700	280	426
Volume to Capacity	0.04	0.20	0.00	0.40	0.99	0.23
Queue Length 95th (ft)	3	0	0	0	251	22
Control Delay (s)	9.2	0.0	8.0	0.0	91.5	16.0
Lane LOS	A		A		F	C
Approach Delay (s)	0.8		0.1		91.5	16.0
Approach LOS					F	C

Intersection Summary				
Average Delay	19.1			
Intersection Capacity Utilization	59.5%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
320: Nobel Drive & Mica Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	145	50	55	110	40	185	35	155	105	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.960			0.944			0.931	
Flt Protected	0.950			0.950				0.976			0.978	
Satd. Flow (prot)	1719	1739	0	1719	1737	0	0	1667	0	0	1648	0
Flt Permitted	0.950			0.950				0.976			0.978	
Satd. Flow (perm)	1719	1739	0	1719	1737	0	0	1667	0	0	1648	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	161	56	61	122	44	206	39	172	117	11	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	217	0	61	166	0	0	417	0	0	261	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	145	50	55	110	40	185	35	155	105	10	120
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	161	56	61	122	44	206	39	172	117	11	133
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	167			217			650	556	189	697	561	144
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	167			217			650	556	189	697	561	144
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			31	90	80	52	97	85
cM capacity (veh/h)	1393			1335			298	404	845	245	401	895

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	39	217	61	167	417	261
Volume Left	39	0	61	0	206	117
Volume Right	0	56	0	44	172	133
cSH	1393	1700	1335	1700	421	400
Volume to Capacity	0.03	0.13	0.05	0.10	0.99	0.65
Queue Length 95th (ft)	2	0	4	0	306	112
Control Delay (s)	7.7	0.0	7.8	0.0	73.3	29.4
Lane LOS	A		A		F	D
Approach Delay (s)	1.2		2.1		73.3	29.4
Approach LOS					F	D

Intersection Summary				
Average Delay	33.6			
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	345	20	60	165	10	20	30	115	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.991			0.906			0.951	
Flt Protected	0.950			0.950				0.994			0.982	
Satd. Flow (prot)	1719	1795	0	1719	1793	0	0	1630	0	0	1690	0
Flt Permitted	0.950			0.950				0.994			0.982	
Satd. Flow (perm)	1719	1795	0	1719	1793	0	0	1630	0	0	1690	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	383	22	67	183	11	22	33	128	22	17	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	405	0	67	194	0	0	183	0	0	61	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	345	20	60	165	10	20	30	115	20	15	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	383	22	67	183	11	22	33	128	22	17	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	199			411			841	821	404	949	827	199
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	199			411			841	821	404	949	827	199
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			91	88	80	86	94	97
cM capacity (veh/h)	1349			1128			240	276	634	158	274	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	44	406	67	194	183	61
Volume Left	44	0	67	0	22	22
Volume Right	0	22	0	11	128	22
cSH	1349	1700	1128	1700	442	268
Volume to Capacity	0.03	0.24	0.06	0.11	0.41	0.23
Queue Length 95th (ft)	3	0	5	0	50	21
Control Delay (s)	7.8	0.0	8.4	0.0	18.8	22.4
Lane LOS	A		A		C	C
Approach Delay (s)	0.8		2.1		18.8	22.4
Approach LOS					C	C

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	380	55	30	165	25	45	10	25	15	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.980			0.958			0.932	
Flt Protected	0.950			0.950				0.973			0.985	
Satd. Flow (prot)	1719	1775	0	1719	1773	0	0	1687	0	0	1661	0
Flt Permitted	0.950			0.950				0.973			0.985	
Satd. Flow (perm)	1719	1775	0	1719	1773	0	0	1687	0	0	1661	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	422	61	33	183	28	50	11	28	17	11	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	483	0	33	211	0	0	89	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	380	55	30	165	25	45	10	25	15	10	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	422	61	33	183	28	50	11	28	17	11	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216			488			846	841	463	829	857	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			488			846	841	463	829	857	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			79	96	95	93	96	97
cM capacity (veh/h)	1330			1055			244	275	588	247	269	819

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	483	33	211	89	56
Volume Left	50	0	33	0	50	17
Volume Right	0	61	0	28	28	28
cSH	1330	1700	1055	1700	304	389
Volume to Capacity	0.04	0.28	0.03	0.12	0.29	0.14
Queue Length 95th (ft)	3	0	2	0	30	12
Control Delay (s)	7.8	0.0	8.5	0.0	21.7	15.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.7		1.2		21.7	15.8
Approach LOS					C	C

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	250	110	375	160	1	55	125	90	1	480	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.965						0.955			0.992	
Flt Protected		0.993			0.966			0.990				
Satd. Flow (prot)	0	1734	0	0	1748	0	0	1711	0	0	1795	0
Flt Permitted		0.993			0.966			0.990				
Satd. Flow (perm)	0	1734	0	0	1748	0	0	1711	0	0	1795	0
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	67	278	122	417	178	1	61	139	100	1	533	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	467	0	0	596	0	0	300	0	0	567	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	250	110	375	160	1	55	125	90	1	480	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	67	278	122	417	178	1	61	139	100	1	533	33
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	963	923	560	1134	890	199	572			244		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	963	923	560	1134	890	199	572			244		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	32	0	76	0	31	100	94			100		
cM capacity (veh/h)	98	248	518	0	259	828	982			1300		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	467	596	300	568
Volume Left	67	417	61	1
Volume Right	122	1	100	33
cSH	229	0	982	1300
Volume to Capacity	2.04	Err	0.06	0.00
Queue Length 95th (ft)	869	Err	5	0
Control Delay (s)	517.9	Err	2.3	0.0
Lane LOS	F	F	A	A
Approach Delay (s)	517.9	Err	2.3	0.0
Approach LOS	F	F		

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	108.3%	ICU Level of Service	G	
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	90	340	50	245	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	1810	1538	1719	1810
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	1810	1538	1719	1810
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	133	100	378	56	272	1106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	100	378	56	272	1106
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	120	90	340	50	245	995
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	133	100	378	56	272	1106
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2038	388			438	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2038	388			438	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			75	
cM capacity (veh/h)	46	648			1101	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	133	100	378	56	272	1106
Volume Left	133	0	0	0	272	0
Volume Right	0	100	0	56	0	0
cSH	46	648	1700	1700	1101	1700
Volume to Capacity	2.92	0.15	0.22	0.03	0.25	0.65
Queue Length 95th (ft)	361	14	0	0	24	0
Control Delay (s)	1055.5	11.6	0.0	0.0	9.3	0.0
Lane LOS	F	B			A	
Approach Delay (s)	608.1		0.0		1.8	
Approach LOS	F					

Intersection Summary				
Average Delay		70.6		
Intersection Capacity Utilization		66.7%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	230	10	25	220	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.994				0.876	
Flt Protected				0.995	0.996	
Satd. Flow (prot)	1799	0	0	1800	1579	0
Flt Permitted				0.995	0.996	
Satd. Flow (perm)	1799	0	0	1800	1579	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	256	11	28	244	1	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	0	0	272	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	230	10	25	220	1	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	256	11	28	244	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			267		561	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		561	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1280		473	770

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	267	272	12
Volume Left	0	28	1
Volume Right	11	0	11
cSH	1700	1280	729
Volume to Capacity	0.16	0.02	0.02
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	1.0	10.0
Lane LOS		A	B
Approach Delay (s)	0.0	1.0	10.0
Approach LOS			B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		39.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	75	125	10	50	55	50	175	1	140	680	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.929			0.936			0.999			0.980	
Flt Protected		0.992			0.996			0.989			0.993	
Satd. Flow (prot)	0	1668	0	0	1687	0	0	1788	0	0	1761	0
Flt Permitted		0.992			0.996			0.989			0.993	
Satd. Flow (perm)	0	1668	0	0	1687	0	0	1788	0	0	1761	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	83	139	11	56	61	56	194	1	156	756	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	128	0	0	251	0	0	1073	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	75	125	10	50	55	50	175	1	140	680	145
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	83	139	11	56	61	56	194	1	156	756	161
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1552	1464	846	1644	1544	205	922			201		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1552	1464	846	1644	1544	205	922			201		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	19	61	17	39	93	92			88		
cM capacity (veh/h)	37	102	355	13	92	821	726			1348		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	267	128	251	1072
Volume Left	44	11	56	156
Volume Right	139	61	1	161
cSH	112	85	726	1348
Volume to Capacity	2.39	1.51	0.08	0.12
Queue Length 95th (ft)	591	253	6	10
Control Delay (s)	714.5	367.8	3.0	2.9
Lane LOS	F	F	A	A
Approach Delay (s)	714.5	367.8	3.0	2.9
Approach LOS	F	F		

Intersection Summary				
Average Delay	140.5			
Intersection Capacity Utilization	90.1%	ICU Level of Service	E	
Analysis Period (min)	15			

```
*******************************************************************************
*                                                                             *
*   9:1:09            2035 BUILD - CHERYL/NEW LACY-NO IMP.                46  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*  105  420    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  765   65    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000 1145    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     525    830   1145                  * AVEDEL  s 180.9 *
* CAPACITY    veh    1367    808    994                  * LOS   SIG     F *
* AVE DELAY  mins    0.07   2.71   4.59                  * LOS UNSIG     F *
* MAX DELAY  mins    0.09   5.38   9.60                  *                    *
* AVE QUEUE   veh       1     44    107                  * VEHIC HRS 125.6 *
* MAX QUEUE   veh       1     73    165                  * COST    $  1884 *
*                                                        *                    *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09            2035 BUILD - CHERYL/NEW LACY-NO IMP.                46  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   60  890    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  970   90    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  670    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     950   1060    670                  * AVEDEL  s 388.4 *
* CAPACITY    veh    1603    559   1001                  * LOS   SIG     F *
* AVE DELAY  mins    0.09  16.17   0.18                  * LOS UNSIG     F *
* MAX DELAY  mins    0.14  30.34   0.27                  *                    *
* AVE QUEUE   veh       2    348      2                  * VEHIC HRS 289.1 *
* MAX QUEUE   veh       2    537      3                  * COST    $  4337 *
*                                                        *                    *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09            2035 BUILD - CHERYL/NEW LACY-NO IMP.                47  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*  105  420    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  765   65    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000 1145    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     525    830   1145              * AVEDEL  s  43.6 *
* CAPACITY    veh    1455   1005   1189              * LOS   SIG     D *
* AVE DELAY  mins    0.06   0.42   1.25              * LOS UNSIG     E *
* MAX DELAY  mins    0.09   0.78   2.60              *                      *
* AVE QUEUE   veh       1      6     26              * VEHIC HRS  30.3 *
* MAX QUEUE   veh       1     10     51              * COST    $   455 *
*                                                    *                      *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09            2035 BUILD - CHERYL/NEW LACY-NO IMP.                48  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   60  890    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  970   90    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  670    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     950   1060    670              * AVEDEL  s 219.5 *
* CAPACITY    veh    1800    756   1190              * LOS   SIG     F *
* AVE DELAY  mins    0.07   9.11   0.11              * LOS UNSIG     F *
* MAX DELAY  mins    0.10  18.88   0.16              *                      *
* AVE QUEUE   veh       1    199      1              * VEHIC HRS 163.4 *
* MAX QUEUE   veh       1    314      2              * COST    $  2451 *
*                                                    *                      *
*****************************************************************************
```

APPENDIX D

BACKGROUND TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS
WITH IMPROVEMENTS

APPENDIX D

Year 2008 Existing Traffic Peak Hour Analysis Outputs *With Improvements*

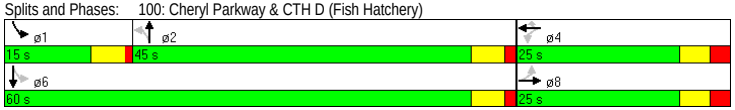
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	15	20	15	5	115	10	955	80	235	310	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	200		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.980				0.850		0.988			0.991	
Flt Protected		0.964			0.963		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1743	1538	1770	3490	0	1752	3468	0
Flt Permitted		0.766			0.786		0.510			0.099		
Satd. Flow (perm)	0	1388	0	0	1417	1510	947	3490	0	183	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	125	19	25	19	6	72	12	1194	100	294	388	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	25	72	12	1294	0	294	413	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.63			0.09	0.25	0.03	0.81		0.90	0.18	
Control Delay		40.7			27.4	29.6	12.4	23.0		50.1	5.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		40.7			27.4	29.6	12.4	23.0		50.1	5.7	
90th %ile Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
90th %ile Term Code	Max	Max		Hold	Hold	Hold	Max	Max		Max	Hold	
70th %ile Green (s)	18.4	18.4		18.4	18.4	18.4	39.5	39.5		10.0	54.5	
70th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Max	Max		Max	Hold	
50th %ile Green (s)	15.4	15.4		15.4	15.4	15.4	38.6	38.6		10.0	53.6	
50th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Gap	Gap		Max	Hold	
30th %ile Green (s)	12.4	12.4		12.4	12.4	12.4	32.5	32.5		10.0	47.5	
30th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Gap	Gap		Max	Hold	
10th %ile Green (s)	10.0	10.0		10.0	10.0	10.0	27.0	27.0		10.0	42.0	
10th %ile Term Code	Min	Min		Hold	Hold	Hold	Gap	Gap		Max	Hold	
Queue Length 50th (ft)		79			10	31	3	270		91	35	
Queue Length 95th (ft)		125			27	59	11	315		#205	53	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			200		
Base Capacity (vph)		347			354	378	492	1814		328	2487	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.49			0.07	0.19	0.02	0.71		0.90	0.17	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 77	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 85	
70th %ile Actuated Cycle: 84.4	
50th %ile Actuated Cycle: 80.5	
30th %ile Actuated Cycle: 71.4	
10th %ile Actuated Cycle: 63.5	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Copy of Analysis\1. 2008 Exist\IMPROVE\AM.syn Synchro 7 - Report
Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	15	20	15	5	115	10	955	80	235	310	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1736	1508	1764	3491		1752	3468	
Flt Permitted		0.77			0.79	1.00	0.51	1.00		0.10	1.00	
Satd. Flow (perm)		1387			1416	1508	947	3491		183	3468	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	125	19	25	19	6	72	12	1194	100	294	388	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	169	0	0	25	72	12	1294	0	294	413	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	3%	3%	3%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.8			14.8	14.8	35.4	35.4		50.5	50.5	
Effective Green, g (s)		14.8			14.8	14.8	35.4	35.4		50.5	50.5	
Actuated g/C Ratio		0.19			0.19	0.19	0.46	0.46		0.66	0.66	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		267			273	291	437	1609		327	2280	
v/s Ratio Prot								0.37		c0.12	0.12	
v/s Ratio Perm		c0.12			0.02	0.05	0.01			c0.47		
v/c Ratio		0.63			0.09	0.25	0.03	0.80		0.90	0.18	
Uniform Delay, d1		28.5			25.5	26.3	11.3	17.7		20.1	5.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1			0.2	0.5	0.0	3.2		25.3	0.1	
Delay (s)		33.6			25.6	26.8	11.3	20.9		45.3	5.2	
Level of Service		C			C	C	B	C		D	A	
Approach Delay (s)		33.6			26.5			20.8			21.9	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	22.3	HCM Level of Service		C
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	76.8	Sum of lost time (s)		11.0
Intersection Capacity Utilization	70.0%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

Volume
110: Cheryl Parkway & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	180	10	10	80	10	5	15	20	5	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.986			0.931			0.930	
Flt Protected		0.989			0.995			0.994			0.988	
Satd. Flow (prot)	0	1831	0	0	1792	0	0	1724	0	0	1492	0
Flt Permitted		0.989			0.995			0.994			0.988	
Satd. Flow (perm)	0	1831	0	0	1792	0	0	1724	0	0	1492	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	17%	17%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	82	269	15	15	119	15	7	22	30	7	7	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	366	0	0	149	0	0	59	0	0	29	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	180	10	10	80	10	5	15	20	5	5	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Hourly flow rate (vph)	82	269	15	15	119	15	7	22	30	7	7	15
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked				1.00			1.00	1.00	1.00	1.00	1.00	
vC, conflicting volume	139			289			626	614	286	648	614	137
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			283			621	610	280	644	610	137
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.2	3.5
p0 queue free %	94			99			98	94	96	98	98	98
cM capacity (veh/h)	1438			1257			359	376	749	312	358	866

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	366	149	60	30
Volume Left	82	15	7	7
Volume Right	15	15	30	15
cSH	1438	1257	497	482
Volume to Capacity	0.06	0.01	0.12	0.06
Queue Length 95th (ft)	5	1	10	5
Control Delay (s)	2.1	0.9	13.2	13.0
Lane LOS	A	A	B	B
Approach Delay (s)	2.1	0.9	13.2	13.0
Approach LOS			B	B

Intersection Summary					
Average Delay			3.5		
Intersection Capacity Utilization			31.3%	ICU Level of Service	A
Analysis Period (min)			15		

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

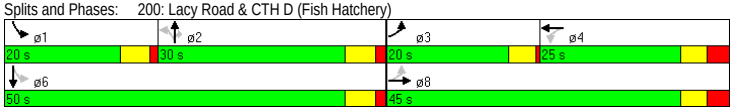
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	195	25	20	90	135	40	695	55	75	185	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	0.99		0.99		0.98	1.00	0.99	
Frt		0.983			0.910				0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1810	0	1719	1627	0	1770	3539	1583	1736	3342	0
Flt Permitted	0.372			0.600			0.581			0.141		
Satd. Flow (perm)	685	1810	0	1080	1627	0	1075	3539	1555	257	3342	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			408			1411	
Travel Time (s)		22.0			13.2			7.0			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	224	229	29	24	106	159	47	818	32	88	218	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	258	0	24	265	0	47	818	32	88	277	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.49	0.34		0.10	0.73		0.14	0.76	0.07	0.36	0.20	
Control Delay	18.6	18.0		28.8	44.2		24.5	32.1	23.2	18.2	14.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	18.6	18.0		28.8	44.2		24.5	32.1	23.2	18.2	14.8	
90th %ile Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	9.6	39.1	
90th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	13.1	35.6		18.5	18.5		24.5	24.5	24.5	7.9	37.4	
70th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
50th %ile Green (s)	11.2	33.7		18.5	18.5		24.5	24.5	24.5	6.9	36.4	
50th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
30th %ile Green (s)	9.5	31.2		17.7	17.7		24.5	24.5	24.5	6.0	35.5	
30th %ile Term Code	Gap	Hold		Gap	Gap		Max	Max	Max	Gap	Hold	
10th %ile Green (s)	6.2	22.8		12.6	12.6		18.0	18.0	18.0	0.0	18.0	
10th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Gap	Gap	Skip	Hold	
Queue Length 50th (ft)	71	89		10	127		18	201	12	25	43	
Queue Length 95th (ft)	117	141		31	#240		45	280	33	53	70	
Internal Link Dist (ft)		1051			599			328			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	537	930		267	402		352	1158	509	406	1986	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.42	0.28		0.09	0.66		0.13	0.71	0.06	0.22	0.14	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 77.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 89.6	
70th %ile Actuated Cycle: 85	
50th %ile Actuated Cycle: 82.1	
30th %ile Actuated Cycle: 78.7	
10th %ile Actuated Cycle: 52.8	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	195	25	20	90	135	40	695	55	75	185	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.91		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1751	1810		1711	1628		1760	3539	1557	1735	3342	
Flt Permitted	0.37	1.00		0.60	1.00		0.58	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	685	1810		1080	1628		1077	3539	1557	258	3342	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	224	229	29	24	106	159	47	818	32	88	218	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	224	258	0	24	265	0	47	818	32	88	277	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	32.4	32.4		17.4	17.4		23.5	23.5	23.5	34.1	34.1	
Effective Green, g (s)	32.4	32.4		17.4	17.4		23.5	23.5	23.5	34.1	34.1	
Actuated g/C Ratio	0.41	0.41		0.22	0.22		0.30	0.30	0.30	0.43	0.43	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	432	747		239	361		322	1059	466	217	1452	
v/s Ratio Prot	c0.07	0.14			c0.16			c0.23		c0.03	0.08	
v/s Ratio Perm	0.14			0.02			0.04		0.02	0.15		
v/c Ratio	0.52	0.35		0.10	0.73		0.15	0.77	0.07	0.41	0.19	
Uniform Delay, d1	16.0	15.8		24.3	28.4		20.1	25.1	19.7	15.3	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4		0.3	8.0		0.3	3.8	0.1	0.5	0.1	
Delay (s)	16.5	16.2		24.6	36.4		20.4	28.8	19.8	15.8	13.8	
Level of Service	B	B		C	D		C	C	B	B	B	
Approach Delay (s)		16.3			35.4			28.1			14.3	
Approach LOS		B			D			C			B	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	21.0	
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	210	65	55	155	10	30	20	15	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.991			0.969			0.955	
Flt Protected		0.994		0.950				0.977			0.984	
Satd. Flow (prot)	0	1852	1583	1752	1828	0	0	1763	0	0	1653	0
Flt Permitted		0.994		0.950				0.977			0.984	
Satd. Flow (perm)	0	1852	1583	1752	1828	0	0	1763	0	0	1653	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	8%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	292	90	76	215	14	42	28	21	7	7	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	334	90	76	229	0	0	91	0	0	21	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	210	65	55	155	10	30	20	15	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	42	292	90	76	215	14	42	28	21	7	7	7
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	234			387			763	767	302	795	850	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			387			763	767	302	795	850	232
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	97			93			85	91	97	97	97	99
cM capacity (veh/h)	1328			1161			285	298	732	246	261	786

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	333	90	76	229	90	21
Volume Left	42	0	76	0	42	7
Volume Right	0	90	0	14	21	7
cSH	1328	1700	1161	1700	337	328
Volume to Capacity	0.03	0.05	0.07	0.13	0.27	0.06
Queue Length 95th (ft)	2	0	5	0	27	5
Control Delay (s)	1.2	0.0	8.3	0.0	19.5	16.7
Lane LOS	A		A		C	C
Approach Delay (s)	1.0		2.1		19.5	16.7
Approach LOS					C	C

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	160	5	1	245	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	0		0	0
Storage Lanes		1	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.925	
Flt Protected					0.978	
Satd. Flow (prot)	1863	1583	0	1810	1653	0
Flt Permitted					0.978	
Satd. Flow (perm)	1863	1583	0	1810	1653	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	5%	5%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	190	6	1	292	24	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	6	0	293	54	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	160	5	1	245	20	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	190	6	1	292	24	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			196		485	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			196		485	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	96
cM capacity (veh/h)			1359		537	846

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	190	6	293	54
Volume Left	0	0	1	24
Volume Right	0	6	0	30
cSH	1700	1700	1359	674
Volume to Capacity	0.11	0.00	0.00	0.08
Queue Length 95th (ft)	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	10.8
Lane LOS			A	B
Approach Delay (s)	0.0		0.0	10.8
Approach LOS				B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

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Volume
230: Lacy Road & Fahey Glen 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	185	5	5	245	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.997				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1857	0	0	1808	1575	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1857	0	0	1808	1575	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1462			735	729	
Travel Time (s)	28.5			14.3	14.2	
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	226	6	6	299	6	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	232	0	0	305	18	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
230: Lacy Road & Fahey Glen 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	185	5	5	245	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	226	6	6	299	6	12
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			237		550	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			237		550	239
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			100		99	98
cM capacity (veh/h)			1307		480	779

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	232	305	18
Volume Left	0	6	6
Volume Right	6	0	12
cSH	1700	1307	645
Volume to Capacity	0.14	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.2	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.7
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		28.4%	ICU Level of Service A
Analysis Period (min)		15	

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	55	1	5	145	55	5	205	5	10	35	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		150
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.964			0.997				0.850
Flt Protected		0.964			0.999			0.999			0.989	
Satd. Flow (prot)	0	1759	0	0	1726	0	0	1837	0	0	1756	1509
Flt Permitted		0.964			0.999			0.999			0.989	
Satd. Flow (perm)	0	1759	0	0	1726	0	0	1837	0	0	1756	1509
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	196	65	1	6	173	65	6	244	6	12	42	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	262	0	0	244	0	0	256	0	0	54	77
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	165	55	1	5	145	55	5	205	5	10	35	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	196	65	1	6	173	65	6	244	6	12	42	77
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	486	337	52	368	334	257	47			255		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	486	337	52	368	334	257	47			255		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	41	88	100	99	70	91	100			99		
cM capacity (veh/h)	333	568	1002	516	567	766	1548			1276		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	263	244	256	54	77
Volume Left	196	6	6	12	0
Volume Right	1	65	6	0	77
cSH	373	608	1548	1276	1700
Volume to Capacity	0.71	0.40	0.00	0.01	0.05
Queue Length 95th (ft)	130	48	0	1	0
Control Delay (s)	34.8	14.8	0.2	1.8	0.0
Lane LOS	D	B	A	A	
Approach Delay (s)	34.8	14.8	0.2	0.7	
Approach LOS	D	B			

Intersection Summary				
Average Delay	14.5			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	10	5	5	10	5	700	30	50	145	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.958			0.976		0.950			0.950		
Satd. Flow (prot)	0	1785	1583	0	1325	1154	1752	1845	1568	1656	1743	1482
Flt Permitted		0.958			0.976		0.950			0.950		
Satd. Flow (perm)	0	1785	1583	0	1325	1154	1752	1845	1568	1656	1743	1482
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	40%	40%	40%	3%	3%	3%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	40	6	11	6	6	11	6	805	34	57	167	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	11	0	12	11	6	805	34	57	167	17
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	5	10	5	5	10	5	700	30	50	145	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	40	6	11	6	6	11	6	805	34	57	167	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1122	1142	177	1122	1125	815	189			844		
vC1, stage 1 conf vol	287	287		821	821							
vC2, stage 2 conf vol	835	856		301	304							
vCu, unblocked vol	1122	1142	177	1122	1125	815	189			844		
tC, single (s)	7.1	6.5	6.2	7.5	6.9	6.6	4.1			4.2		
tC, 2 stage (s)	6.1	5.5		6.5	5.9							
tF (s)	3.5	4.0	3.3	3.9	4.4	3.7	2.2			2.3		
p0 queue free %	85	98	99	98	98	96	100			92		
cM capacity (veh/h)	271	298	859	290	307	322	1373			760		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	46	11	11	11	6	805	34	57	167	17
Volume Left	40	0	6	0	6	0	0	57	0	0
Volume Right	0	11	0	11	0	0	34	0	0	17
cSH	274	859	298	322	1373	1700	1700	760	1700	1700
Volume to Capacity	0.17	0.01	0.04	0.04	0.00	0.47	0.02	0.08	0.10	0.01
Queue Length 95th (ft)	15	1	3	3	0	0	0	6	0	0
Control Delay (s)	20.8	9.2	17.6	16.6	7.6	0.0	0.0	10.1	0.0	0.0
Lane LOS	C	A	C	C	A			B		
Approach Delay (s)	18.5		17.1		0.1			2.4		
Approach LOS	C		C							

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	30	15	5	5	1	5	1	10	5	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.950			0.970			0.919			0.955	
Flt Protected	0.950			0.950				0.984			0.984	
Satd. Flow (prot)	1752	1752	0	1770	1807	0	0	1606	0	0	1249	0
Flt Permitted	0.950			0.950				0.984			0.984	
Satd. Flow (perm)	1752	1752	0	1770	1807	0	0	1606	0	0	1249	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	7%	7%	7%	43%	43%	43%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	31	46	23	8	8	2	8	2	15	8	8	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	69	0	8	10	0	0	25	0	0	24	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	30	15	5	5	1	5	1	10	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Hourly flow rate (vph)	31	46	23	8	8	2	8	2	15	8	8	8
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			74			164	154	68	158	165	18
vC1, stage 1 conf vol							124	124		29	29	
vC2, stage 2 conf vol							40	30		129	136	
vCu, unblocked vol	14			74			164	154	68	158	165	18
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.5	6.9	6.6
tC, 2 stage (s)							6.2	5.6		6.5	5.9	
tF (s)	2.2			2.2			3.6	4.1	3.4	3.9	4.4	3.7
p0 queue free %	98			99			99	100	98	99	99	99
cM capacity (veh/h)	1591			1519			809	738	974	724	668	945

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	31	69	8	9	25	23
Volume Left	31	0	8	0	8	8
Volume Right	0	23	0	2	15	8
cSH	1591	1700	1519	1700	899	762
Volume to Capacity	0.02	0.04	0.01	0.01	0.03	0.03
Queue Length 95th (ft)	1	0	0	0	2	2
Control Delay (s)	7.3	0.0	7.4	0.0	9.1	9.9
Lane LOS	A		A		A	A
Approach Delay (s)	2.2		3.4		9.1	9.9
Approach LOS					A	A

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	20.2%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	90	560	40	25	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1703	1792
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1863	1583	1703	1792
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	18	107	667	48	30	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	107	667	48	30	143
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	90	560	40	25	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	107	667	48	30	143
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	879	677			719	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	677			719	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	94	76			97	
cM capacity (veh/h)	304	449			860	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	18	107	667	48	30	143
Volume Left	18	0	0	0	30	0
Volume Right	0	107	0	48	0	0
cSH	304	449	1700	1700	860	1700
Volume to Capacity	0.06	0.24	0.39	0.03	0.03	0.08
Queue Length 95th (ft)	5	23	0	0	3	0
Control Delay (s)	17.6	15.5	0.0	0.0	9.3	0.0
Lane LOS	C	C			A	
Approach Delay (s)	15.8		0.0		1.6	
Approach LOS	C					

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		43.4%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	100	1	1	80	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.912	
Flt Protected					0.983	
Satd. Flow (prot)	1861	0	0	1845	1670	0
Flt Permitted					0.983	
Satd. Flow (perm)	1861	0	0	1845	1670	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	133	1	1	107	7	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	0	0	108	20	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	100	1	1	80	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	133	1	1	107	7	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			135		243	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		243	134
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1444		744	915

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	108	20
Volume Left	0	1	7
Volume Right	1	0	13
cSH	1700	1444	850
Volume to Capacity	0.08	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.3
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		15.3%	ICU Level of Service A
Analysis Period (min)		15	

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	35	5	5	45	15	10	100	1	10	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.969			0.999			0.946	
Flt Protected		0.968			0.996			0.996			0.990	
Satd. Flow (prot)	0	1777	0	0	1746	0	0	1818	0	0	1561	0
Flt Permitted		0.968			0.996			0.996			0.990	
Satd. Flow (perm)	0	1777	0	0	1746	0	0	1818	0	0	1561	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	4%	4%	4%	14%	14%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	97	45	6	6	58	19	13	130	1	13	26	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	83	0	0	144	0	0	65	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	35	5	5	45	15	10	100	1	10	20	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	97	45	6	6	58	19	13	130	1	13	26	26
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	280	232	49	261	244	141	57			136		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280	232	49	261	244	141	57			136		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	84	93	99	99	91	98	99			99		
cM capacity (veh/h)	592	649	1008	627	635	892	1528			1371		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	149	84	144	65
Volume Left	97	6	13	13
Volume Right	6	19	1	26
cSH	620	680	1528	1371
Volume to Capacity	0.24	0.12	0.01	0.01
Queue Length 95th (ft)	23	11	1	1
Control Delay (s)	12.6	11.0	0.7	1.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.6	11.0	0.7	1.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			

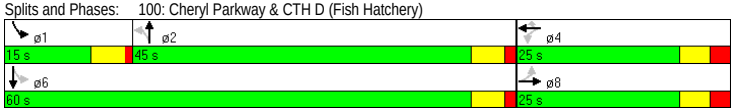
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	15	35	20	280	5	465	5	150	865	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		50	110		0	200		0
Storage Lanes	0		0	0		1	1		0	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Frt		0.964				0.850		0.998			0.988	
Flt Protected		0.969			0.969		0.950			0.950		
Satd. Flow (prot)	0	1698	0	0	1805	1583	1736	3463	0	1770	3490	0
Flt Permitted		0.770			0.770		0.265			0.342		
Satd. Flow (perm)	0	1344	0	0	1429	1554	484	3463	0	636	3490	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	40	6	17	40	23	161	6	534	6	172	994	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	63	161	6	540	0	172	1080	0
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Detector Phase	8	8		4	4	4	2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		5.0	18.0	
Minimum Split (s)	16.0	16.0		16.0	16.0	16.0	21.5	21.5		10.0	23.5	
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	45.0	45.0	0.0	15.0	60.0	0.0
Total Split (%)	29.4%	29.4%	0.0%	29.4%	29.4%	29.4%	52.9%	52.9%	0.0%	17.6%	70.6%	0.0%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	39.5	39.5		10.0	54.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	1.5	1.5		1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	5.5	5.5	4.0	5.0	5.5	4.0
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5	3.5	4.0	4.0		2.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		1.0	3.0	

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	10.0	20.0	20.0		0.0	20.0	
Time To Reduce (s)	5.0	5.0		5.0	5.0	5.0	10.0	10.0		0.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.19			0.18	0.42	0.03	0.43		0.30	0.48	
Control Delay		19.6			19.4	22.8	14.4	15.5		7.3	7.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		19.6			19.4	22.8	14.4	15.5		7.3	7.8	
90th %ile Green (s)	16.6	16.6		16.6	16.6	16.6	22.4	22.4		10.0	37.4	
90th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Gap	Gap		Max	Hold	
70th %ile Green (s)	13.0	13.0		13.0	13.0	13.0	18.0	18.0		8.3	31.3	
70th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Gap	Gap		Gap	Hold	
50th %ile Green (s)	10.9	10.9		10.9	10.9	10.9	16.0	16.0		7.1	28.1	
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Min	Min		Gap	Hold	
30th %ile Green (s)	10.0	10.0		10.0	10.0	10.0	16.0	16.0		6.2	27.2	
30th %ile Term Code	Hold	Hold		Min	Min	Min	Min	Min		Gap	Hold	
10th %ile Green (s)	0.0	0.0		0.0	0.0	0.0	16.0	16.0		5.2	26.2	
10th %ile Term Code	Skip	Skip		Skip	Skip	Skip	Min	Min		Gap	Hold	
Queue Length 50th (ft)		15			15	42	1	66		21	94	
Queue Length 95th (ft)		46			46	100	9	122		52	165	
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)						50	110			200		
Base Capacity (vph)		537			571	620	378	2704		636	3357	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.12			0.11	0.26	0.02	0.20		0.27	0.32	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 50.4	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 65.5	
70th %ile Actuated Cycle: 55.8	
50th %ile Actuated Cycle: 50.5	
30th %ile Actuated Cycle: 48.7	
10th %ile Actuated Cycle: 31.7	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery)

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	5	15	35	20	280	5	465	5	150	865	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1689			1797	1551	1733	3464		1769	3490	
Flt Permitted		0.77			0.77	1.00	0.26	1.00		0.34	1.00	
Satd. Flow (perm)		1341			1427	1551	483	3464		636	3490	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	40	6	17	40	23	161	6	534	6	172	994	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	63	0	0	63	161	6	540	0	172	1080	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			pm+pt		
Protected Phases		8			4			2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		9.2			9.2	9.2	18.6	18.6		31.0	31.0	
Effective Green, g (s)		9.2			9.2	9.2	18.6	18.6		31.0	31.0	
Actuated g/C Ratio		0.18			0.18	0.18	0.36	0.36		0.60	0.60	
Clearance Time (s)		6.0			6.0	6.0	5.5	5.5		5.0	5.5	
Vehicle Extension (s)		3.5			3.5	3.5	4.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		239			254	276	174	1246		544	2093	
v/s Ratio Prot								0.16		0.05	c0.31	
v/s Ratio Perm		0.05			0.04	c0.10	0.01			0.14		
v/c Ratio		0.26			0.25	0.58	0.03	0.43		0.32	0.52	
Uniform Delay, d1		18.3			18.3	19.5	10.7	12.6		5.0	6.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.6	3.3	0.1	0.3		0.1	0.3	
Delay (s)		19.0			18.9	22.8	10.8	12.9		5.1	6.3	
Level of Service		B			B	C	B	B		A	A	
Approach Delay (s)		19.0			21.7			12.9			6.1	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	11.5
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
110: Cheryl Parkway & Research Park Drive

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	110	5	45	220	5	20	5	20	20	35	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.998			0.940			0.927	
Flt Protected		0.987			0.992			0.978			0.992	
Satd. Flow (prot)	0	1831	0	0	1844	0	0	1617	0	0	1696	0
Flt Permitted		0.987			0.992			0.978			0.992	
Satd. Flow (perm)	0	1831	0	0	1844	0	0	1617	0	0	1696	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		644			1558			1394			450	
Travel Time (s)		12.5			30.4			31.7			10.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	8%	8%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	51	139	6	57	278	6	25	6	25	25	44	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	196	0	0	341	0	0	56	0	0	151	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
110: Cheryl Parkway & Research Park Drive

2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	110	5	45	220	5	20	5	20	20	35	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	51	139	6	57	278	6	25	6	25	25	44	82
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		644										
pX, platoon unblocked												
vC, conflicting volume	290			151			754	652	152	678	652	292
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			151			754	652	152	678	652	292
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	96			96			89	98	97	92	87	89
cM capacity (veh/h)	1267			1425			237	347	871	324	353	739

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	196	342	57	152
Volume Left	51	57	25	25
Volume Right	6	6	25	82
cSH	1267	1425	370	482
Volume to Capacity	0.04	0.04	0.15	0.32
Queue Length 95th (ft)	3	3	13	33
Control Delay (s)	2.3	1.6	16.5	15.9
Lane LOS	A	A	C	C
Approach Delay (s)	2.3	1.6	16.5	15.9
Approach LOS			C	C

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
200: Lacy Road & CTH D (Fish Hatchery)

2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	115	40	80	225	95	60	285	30	190	600	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		0	155		0	100		175	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	0.99		1.00		0.98	1.00	0.99	
Frt		0.961			0.956				0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1783	0	1736	1736	0	1752	3505	1568	1770	3416	0
Flt Permitted	0.261			0.643			0.325			0.424		
Satd. Flow (perm)	485	1783	0	1168	1736	0	598	3505	1540	788	3416	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			408			1411	
Travel Time (s)		22.0			13.2			7.0			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	76	134	47	93	262	110	70	331	17	221	698	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	181	0	93	372	0	70	331	17	221	872	0
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Detector Phase	3	8		4	4		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		16.0	16.0	16.0	5.0	16.0	
Minimum Split (s)	9.0	16.5		16.5	16.5		21.5	21.5	21.5	10.0	21.5	
Total Split (s)	20.0	45.0	0.0	25.0	25.0	0.0	30.0	30.0	30.0	20.0	50.0	0.0
Total Split (%)	21.1%	47.4%	0.0%	26.3%	26.3%	0.0%	31.6%	31.6%	31.6%	21.1%	52.6%	0.0%
Maximum Green (s)	16.0	38.5		18.5	18.5		24.5	24.5	24.5	15.0	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.5	3.0		3.0	3.0		1.5	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.5	4.0	6.5	6.5	4.0	5.5	5.5	5.5	5.0	5.5	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Minimum Gap (s)	2.0	3.0		3.0	3.0		3.0	3.0	3.0	2.0	3.0	

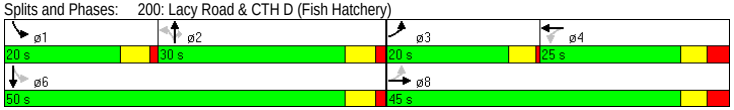
Volume
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0		20.0	20.0	20.0	0.0	20.0	
Time To Reduce (s)	0.0	10.0		10.0	10.0		10.0	10.0	10.0	0.0	10.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.24	0.27		0.31	0.83		0.46	0.38	0.04	0.44	0.55	
Control Delay	16.8	18.3		29.1	46.8		36.9	25.1	23.1	15.3	16.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	16.8	18.3		29.1	46.8		36.9	25.1	23.1	15.3	16.2	
90th %ile Green (s)	9.2	31.7		18.5	18.5		24.5	24.5	24.5	14.7	44.2	
90th %ile Term Code	Gap	Hold		Max	Max		Max	Max	Max	Gap	Hold	
70th %ile Green (s)	7.3	29.8		18.5	18.5		19.6	19.6	19.6	11.9	36.5	
70th %ile Term Code	Gap	Hold		Max	Max		Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	6.3	28.8		18.5	18.5		16.0	16.0	16.0	10.2	31.2	
50th %ile Term Code	Gap	Hold		Max	Max		Min	Min	Min	Gap	Hold	
30th %ile Green (s)	5.5	28.0		18.5	18.5		16.0	16.0	16.0	8.7	29.7	
30th %ile Term Code	Gap	Hold		Max	Max		Min	Min	Min	Gap	Hold	
10th %ile Green (s)	0.0	18.5		18.5	18.5		16.0	16.0	16.0	6.3	27.3	
10th %ile Term Code	Skip	Hold		Max	Max		Min	Min	Min	Gap	Hold	
Queue Length 50th (ft)	19	52		33	156		28	66	6	60	148	
Queue Length 95th (ft)	52	115		86	#364		70	108	22	103	200	
Internal Link Dist (ft)		1051			599			328			1331	
Turn Bay Length (ft)	130			155			100		175	150		
Base Capacity (vph)	484	957		301	448		204	1197	526	573	2118	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.16	0.19		0.31	0.83		0.34	0.28	0.03	0.39	0.41	

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 73.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 87.9
70th %ile Actuated Cycle: 78.3
50th %ile Actuated Cycle: 72
30th %ile Actuated Cycle: 69.7
10th %ile Actuated Cycle: 57.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	115	40	80	225	95	60	285	30	190	600	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1769	1783		1728	1737		1747	3505	1540	1768	3416	
Flt Permitted	0.26	1.00		0.64	1.00		0.33	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	486	1783		1170	1737		598	3505	1540	790	3416	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	76	134	47	93	262	110	70	331	17	221	698	174
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	76	181	0	93	372	0	70	331	17	221	872	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	28.2	28.2		18.9	18.9		18.5	18.5	18.5	33.7	33.7	
Effective Green, g (s)	28.2	28.2		18.9	18.9		18.5	18.5	18.5	33.7	33.7	
Actuated g/C Ratio	0.38	0.38		0.26	0.26		0.25	0.25	0.25	0.46	0.46	
Clearance Time (s)	4.0	6.5		6.5	6.5		5.5	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.0		4.0	4.0		4.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	277	680		299	444		150	877	386	495	1558	
v/s Ratio Prot	0.02	c0.10			c0.21			0.09		0.06	c0.26	
v/s Ratio Perm	0.08			0.08			0.12		0.01	0.14		
v/c Ratio	0.27	0.27		0.31	0.84		0.47	0.38	0.04	0.45	0.56	
Uniform Delay, d1	15.8	15.7		22.2	26.0		23.5	22.9	21.0	12.8	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.8	13.5		3.1	0.4	0.1	0.2	0.5	
Delay (s)	16.0	16.0		23.0	39.5		26.6	23.3	21.1	13.0	15.2	
Level of Service	B	B		C	D		C	C	C	B	B	
Approach Delay (s)		16.0			36.2			23.8			14.8	
Approach LOS		B			D			C			B	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	18.5	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
210: Lacy Road & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	250	50	15	210	5	50	10	35	10	10	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.997			0.950			0.894	
Flt Protected		0.998		0.950				0.974			0.995	
Satd. Flow (prot)	0	1859	1583	1752	1839	0	0	1707	0	0	1657	0
Flt Permitted		0.998		0.950				0.974			0.995	
Satd. Flow (perm)	0	1859	1583	1752	1839	0	0	1707	0	0	1657	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	362	72	22	304	7	72	14	51	14	14	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	376	72	22	311	0	0	137	0	0	129	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	250	50	15	210	5	50	10	35	10	10	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	14	362	72	22	304	7	72	14	51	14	14	101
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		679										
pX, platoon unblocked												
vC, conflicting volume	317			440			858	756	372	811	825	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			440			858	756	372	811	825	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			67	96	92	94	95	86
cM capacity (veh/h)	1238			1110			219	323	666	256	296	717

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	377	72	22	312	138	130
Volume Left	14	0	22	0	72	14
Volume Right	0	72	0	7	51	101
cSH	1238	1700	1110	1700	305	528
Volume to Capacity	0.01	0.04	0.02	0.18	0.45	0.25
Queue Length 95th (ft)	1	0	1	0	56	24
Control Delay (s)	0.4	0.0	8.3	0.0	26.2	14.0
Lane LOS	A		A		D	B
Approach Delay (s)	0.4		0.5		26.2	14.0
Approach LOS					D	B

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	40.4%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
220: Lacy Road & Mica Road 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	255	20	15	230	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	0		0	0
Storage Lanes		1	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	1845	1568	0	1857	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	1845	1568	0	1857	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	319	25	19	288	13	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	319	25	0	307	24	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	255	20	15	230	10	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	319	25	19	288	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			344		644	319
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			344		644	319
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	98
cM capacity (veh/h)			1215		431	722

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	319	25	306	25
Volume Left	0	0	19	12
Volume Right	0	25	0	12
cSH	1700	1700	1215	539
Volume to Capacity	0.19	0.01	0.02	0.05
Queue Length 95th (ft)	0	0	1	4
Control Delay (s)	0.0	0.0	0.6	12.0
Lane LOS			A	B
Approach Delay (s)	0.0		0.6	12.0
Approach LOS				B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		34.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
230: Lacy Road & Fahey Glen 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	260	5	5	230	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.998				0.932	
Flt Protected				0.999	0.976	
Satd. Flow (prot)	1841	0	0	1843	1694	0
Flt Permitted				0.999	0.976	
Satd. Flow (perm)	1841	0	0	1843	1694	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1462			735	729	
Travel Time (s)	28.5			14.3	14.2	
Confl. Peds. (#/hr)		5	5		5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	338	6	6	299	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	0	0	305	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
230: Lacy Road & Fahey Glen 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	260	5	5	230	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	338	6	6	299	6	6
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			349		663	351
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			349		663	351
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1199		421	687

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	344	305	13
Volume Left	0	6	6
Volume Right	6	0	6
cSH	1700	1199	522
Volume to Capacity	0.20	0.01	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.2	12.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.1
Approach LOS			B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		27.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
260: Lacy Road & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	140	20	5	65	25	5	40	1	60	220	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		150
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.965			0.998				0.850
Flt Protected		0.986			0.998			0.995			0.989	
Satd. Flow (prot)	0	1780	0	0	1777	0	0	1780	0	0	1824	1568
Flt Permitted		0.986			0.998			0.995			0.989	
Satd. Flow (perm)	0	1780	0	0	1777	0	0	1780	0	0	1824	1568
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	6%	6%	6%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	84	182	26	6	84	32	6	52	1	78	286	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	292	0	0	122	0	0	59	0	0	364	260
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
260: Lacy Road & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	140	20	5	65	25	5	40	1	60	220	200
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	84	182	26	6	84	32	6	52	1	78	286	260
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	592	518	296	634	517	63	291			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	592	518	296	634	517	63	291			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	74	58	96	97	80	97	99			95		
cM capacity (veh/h)	322	430	733	239	431	991	1243			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	292	123	60	364	260
Volume Left	84	6	6	78	0
Volume Right	26	32	1	0	260
cSH	406	483	1243	1533	1700
Volume to Capacity	0.72	0.26	0.01	0.05	0.15
Queue Length 95th (ft)	139	25	0	4	0
Control Delay (s)	33.6	15.0	0.9	2.0	0.0
Lane LOS	D	B	A	A	
Approach Delay (s)	33.6	15.0	0.9	1.1	
Approach LOS	D	B			

Intersection Summary				
Average Delay	11.3			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1	5	25	5	50	5	250	10	10	690	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.955			0.960		0.950			0.950		
Satd. Flow (prot)	0	1779	1583	0	1771	1568	1736	1827	1553	1752	1845	1568
Flt Permitted		0.955			0.960		0.950			0.950		
Satd. Flow (perm)	0	1779	1583	0	1771	1568	1736	1827	1553	1752	1845	1568
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	4%	4%	4%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	1	6	29	6	58	6	291	12	12	802	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	6	0	35	58	6	291	12	12	802	41
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	1	5	25	5	50	5	250	10	10	690	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	1	6	29	6	58	6	291	12	12	802	41
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1199	1150	812	1144	1179	301	848			307		
vC1, stage 1 conf vol	831	831		307	307							
vC2, stage 2 conf vol	368	319		837	871							
vCu, unblocked vol	1199	1150	812	1144	1179	301	848			307		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	98	91	98	92	99			99		
cM capacity (veh/h)	321	350	376	321	333	730	778			1242		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	19	6	35	58	6	291	12	12	802	41
Volume Left	17	0	29	0	6	0	0	12	0	0
Volume Right	0	6	0	58	0	0	12	0	0	41
cSH	322	376	323	730	778	1700	1700	1242	1700	1700
Volume to Capacity	0.06	0.02	0.11	0.08	0.01	0.17	0.01	0.01	0.47	0.02
Queue Length 95th (ft)	5	1	9	6	1	0	0	1	0	0
Control Delay (s)	16.9	14.7	17.5	10.4	9.7	0.0	0.0	7.9	0.0	0.0
Lane LOS	C	B	C	B	A			A		
Approach Delay (s)	16.3		13.0		0.2			0.1		
Approach LOS	C		B							

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Nobel Drive & Research Park Drive 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	5	1	1	60	5	5	1	1	5	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.989			0.985			0.894	
Flt Protected	0.950			0.950				0.963			0.991	
Satd. Flow (prot)	1570	1621	0	1719	1790	0	0	1442	0	0	1530	0
Flt Permitted	0.950			0.950				0.963			0.991	
Satd. Flow (perm)	1570	1621	0	1719	1790	0	0	1442	0	0	1530	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	15%	15%	15%	5%	5%	5%	25%	25%	25%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	14	7	1	1	86	7	7	1	1	7	1	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	8	0	1	93	0	0	9	0	0	37	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	5	1	1	60	5	5	1	1	5	1	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	14	7	1	1	86	7	7	1	1	7	1	29
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98			14			164	142	18	140	139	99
vC1, stage 1 conf vol							41	41		97	97	
vC2, stage 2 conf vol							123	101		43	42	
vCu, unblocked vol	98			14			164	142	18	140	139	99
tC, single (s)	4.2			4.1			7.3	6.8	6.5	7.2	6.6	6.3
tC, 2 stage (s)							6.3	5.8		6.2	5.6	
tF (s)	2.3			2.2			3.7	4.2	3.5	3.6	4.1	3.4
p0 queue free %	99			100			99	100	100	99	100	97
cM capacity (veh/h)	1412			1579			758	725	989	845	761	927

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	14	9	1	93	10	37
Volume Left	14	0	1	0	7	7
Volume Right	0	1	0	7	1	29
cSH	1412	1700	1579	1700	779	903
Volume to Capacity	0.01	0.01	0.00	0.05	0.01	0.04
Queue Length 95th (ft)	1	0	0	0	1	3
Control Delay (s)	7.6	0.0	7.3	0.0	9.7	9.2
Lane LOS	A		A		A	A
Approach Delay (s)	4.7		0.1		9.7	9.2
Approach LOS					A	A

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	19.7%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	35	195	15	90	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	100	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1736	1553	1863	1583	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1736	1553	1863	1583	1770	1863
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	40	40	224	17	103	684
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	40	224	17	103	684
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 2/5/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	35	195	15	90	595
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	40	40	224	17	103	684
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1125	234			246	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1125	234			246	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	95			92	
cM capacity (veh/h)	205	793			1314	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	40	224	17	103	684
Volume Left	40	0	0	0	103	0
Volume Right	0	40	0	17	0	0
cSH	205	793	1700	1700	1314	1700
Volume to Capacity	0.20	0.05	0.13	0.01	0.08	0.40
Queue Length 95th (ft)	18	4	0	0	6	0
Control Delay (s)	26.7	9.8	0.0	0.0	8.0	0.0
Lane LOS	D	A			A	
Approach Delay (s)	18.3		0.0		1.0	
Approach LOS	C					

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		42.9%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
550: Irish Lane & East Hill 2/5/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	90	5	15	120	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.993				0.884	
Flt Protected				0.994	0.993	
Satd. Flow (prot)	1814	0	0	1852	1635	0
Flt Permitted				0.994	0.993	
Satd. Flow (perm)	1814	0	0	1852	1635	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	102	6	17	136	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	153	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 2/5/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	90	5	15	120	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	102	6	17	136	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			108		276	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			108		276	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1483		706	949

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	108	153	7
Volume Left	0	17	1
Volume Right	6	0	6
cSH	1700	1483	898
Volume to Capacity	0.06	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.9	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.0
Approach LOS			A

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		23.8%	ICU Level of Service A
Analysis Period (min)		15	

Volume
560: Irish Lane & Syene Road 2/5/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	40	15	5	35	5	5	25	1	20	105	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.969			0.986			0.997			0.945	
Flt Protected		0.992			0.995			0.992			0.995	
Satd. Flow (prot)	0	1739	0	0	1827	0	0	1842	0	0	1751	0
Flt Permitted		0.992			0.995			0.992			0.995	
Satd. Flow (perm)	0	1739	0	0	1827	0	0	1842	0	0	1751	0
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		863			433			1053			1551	
Travel Time (s)		10.7			5.4			20.5			23.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	13	51	19	6	44	6	6	32	1	25	133	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	56	0	0	39	0	0	266	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
560: Irish Lane & Syene Road 2/5/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	40	15	5	35	5	5	25	1	20	105	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	51	19	6	44	6	6	32	1	25	133	108
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	321	293	197	337	346	42	246			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321	293	197	337	346	42	246			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	91	98	99	92	99	100			98		
cM capacity (veh/h)	567	595	830	547	560	1020	1315			1566		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	82	57	39	266
Volume Left	13	6	6	25
Volume Right	19	6	1	108
cSH	632	588	1315	1566
Volume to Capacity	0.13	0.10	0.00	0.02
Queue Length 95th (ft)	11	8	0	1
Control Delay (s)	11.6	11.8	1.3	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	11.8	1.3	0.8
Approach LOS	B	B		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	27.5%	ICU Level of Service	A	
Analysis Period (min)	15			

APPENDIX D

Year 2025 Background Traffic Peak Hour Analysis Outputs *With Improvements*

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	300	15	1250	270	600	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	0.99		0.98	1.00		0.97
Frt		0.916				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1640	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.754			0.724			0.950			0.950		
Satd. Flow (perm)	1355	1640	0	1301	1810	1514	1701	3438	1514	3330	3438	1500
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	22	28	100	6	167	17	1389	150	667	528	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	50	0	100	6	167	17	1389	150	667	528	14
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	15.0	40.0	40.0	25.0	50.0	50.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	27.8%	27.8%	16.7%	44.4%	44.4%	27.8%	55.6%	55.6%
Maximum Green (s)	19.0	19.0		19.0	19.0	20.5	10.5	34.0	34.0	20.5	44.0	44.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

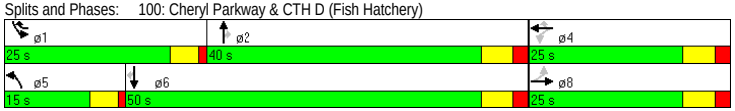
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.68	0.19		0.49	0.02	0.27	0.11	0.95	0.23	0.86	0.23	0.01
Control Delay	51.2	33.2		42.0	29.6	15.3	37.8	32.6	16.8	45.6	8.3	9.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	33.2		42.0	29.6	15.3	37.8	32.6	16.8	45.6	8.3	9.2
90th %ile Green (s)	19.0	19.0		19.0	19.0	20.5	8.0	34.0	34.0	20.5	46.5	46.5
90th %ile Term Code	Max	Max		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	16.5	16.5		16.5	16.5	23.0	8.0	34.0	34.0	23.0	49.0	49.0
70th %ile Term Code	Gap	Gap		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	13.9	13.9		13.9	13.9	22.9	0.0	36.7	36.7	22.9	64.1	64.1
50th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	11.3	11.3		11.3	11.3	20.8	0.0	41.4	41.4	20.8	66.7	66.7
30th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	10.0	10.0		10.0	10.0	17.6	0.0	45.9	45.9	17.6	68.0	68.0
10th %ile Term Code	Min	Min		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	78	25		53	3	54	9	220	44	182	45	2
Queue Length 95th (ft)	133	54		97	13	88	m14	#583	m78	#284	118	13
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	286	346		275	382	631	201	1467	646	798	2249	981
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.14		0.36	0.02	0.26	0.08	0.95	0.23	0.84	0.23	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	300	15	1250	270	600	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1638		1704	1810	1528	1719	3438	1514	3335	3438	1501
Flt Permitted	0.75	1.00		0.72	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1351	1638		1299	1810	1528	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	144	22	28	100	6	167	17	1389	150	667	528	14
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	50	0	100	6	167	17	1389	150	667	528	14
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	14.1	14.1		14.1	14.1	35.1	3.2	38.4	38.4	21.0	56.2	56.2
Effective Green, g (s)	14.1	14.1		14.1	14.1	35.1	3.2	38.4	38.4	21.0	56.2	56.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.39	0.04	0.43	0.43	0.23	0.62	0.62
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	212	257		204	284	596	61	1467	646	778	2147	937
v/s Ratio Prot		0.03			0.00	0.07	0.01	c0.40		c0.20	0.15	
v/s Ratio Perm	c0.11			0.08		0.04			0.10			0.01
v/c Ratio	0.68	0.19		0.49	0.02	0.28	0.28	0.95	0.23	0.86	0.25	0.01
Uniform Delay, d1	35.8	33.0		34.7	32.1	18.8	42.3	24.8	16.4	33.1	7.5	6.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.96	0.76	0.89	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1		0.7	0.0	0.1	0.6	10.6	0.6	8.9	0.3	0.0
Delay (s)	42.5	33.1		35.3	32.1	18.9	41.3	29.4	15.1	42.0	7.8	6.4
Level of Service	D	C		D	C	B	D	C	B	D	A	A
Approach Delay (s)		40.1			25.2			28.2			26.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	850	170	110	485	0	0	0	0	535	1	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.191						0.950	0.953	
Satd. Flow (perm)	0	4451	1538	346	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	944	94	122	539	0	0	0	0	594	1	744
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	944	94	122	539	0	0	0	0	297	298	744
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	38.0	38.0	12.0	50.0	0.0	0.0	0.0	0.0	30.0	30.0	30.0
Total Split (%)	0.0%	47.5%	47.5%	15.0%	62.5%	0.0%	0.0%	0.0%	0.0%	37.5%	37.5%	37.5%
Maximum Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

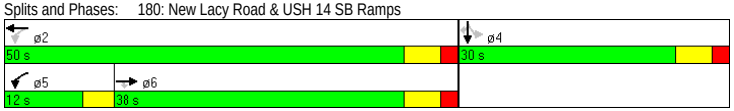
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.49	0.14	0.38	0.29					0.59	0.59	0.90
Control Delay		18.2	15.9	7.1	2.6					29.3	29.3	42.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		18.2	15.9	7.1	2.6					29.3	29.3	42.2
90th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		32.6	32.6	7.9	44.0					24.0	24.0	24.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		32.3	32.3	7.1	42.9					25.1	25.1	25.1
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		31.2	31.2	6.3	41.0					27.0	27.0	27.0
30th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
10th %ile Green (s)		45.3	45.3	0.0	45.3					22.7	22.7	22.7
10th %ile Term Code		Coord	Coord	Skip	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		141	29	49	63					129	130	198
Queue Length 95th (ft)		184	60	0	0					218	218	#321
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		1938	670	345	1902					507	508	840
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.49	0.14	0.35	0.28					0.59	0.59	0.89

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 77 (96%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	850	170	110	485	0	0	0	0	535	1	905
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438					1633	1637	2707
Flt Permitted		1.00	1.00	0.19	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4451	1538	346	3438					1633	1637	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	944	94	122	539	0	0	0	0	594	1	744
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	944	94	122	539	0	0	0	0	297	298	744
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		33.9	33.9	43.4	43.4					24.6	24.6	24.6
Effective Green, g (s)		33.9	33.9	43.4	43.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42	0.42	0.54	0.54					0.31	0.31	0.31
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		1886	652	291	1865					502	503	832
v/s Ratio Prot		c0.21		c0.03	0.16							
v/s Ratio Perm			0.06	0.20						0.18	0.18	c0.27
v/c Ratio		0.50	0.14	0.42	0.29					0.59	0.59	0.89
Uniform Delay, d1		16.9	14.1	9.9	9.9					23.4	23.5	26.5
Progression Factor		1.00	1.00	0.49	0.22					1.00	1.00	1.00
Incremental Delay, d2		1.0	0.5	0.3	0.3					1.2	1.3	11.8
Delay (s)		17.8	14.6	5.1	2.5					24.7	24.7	38.2
Level of Service		B	B	A	A					C	C	D
Approach Delay (s)		17.5			3.0			0.0			32.2	
Approach LOS		B			A			A			C	

Intersection Summary

HCM Average Control Delay	20.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		15.5	
Intersection Capacity Utilization	61.5%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	690	695	0	0	355	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	767	772	0	0	394	264	267	1	72	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	767	772	0	0	394	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

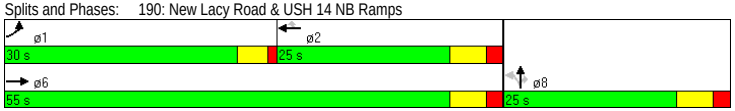
Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.83	0.34			0.36	0.54		0.79	0.24			
Control Delay	19.7	2.0			23.9	30.2		46.9	27.7			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	19.7	2.0			23.9	30.2		46.9	27.7			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	24.8	49.0			19.7	19.7	19.0	19.0	19.0			
70th %ile Term Code	Gap	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	22.7	51.3			24.1	24.1	16.7	16.7	16.7			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	20.4	54.0			29.1	29.1	14.0	14.0	14.0			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	17.1	57.8			36.2	36.2	10.2	10.2	10.2			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	181	25			81	111		126	30			
Queue Length 95th (ft)	246	30			132	#229		202	63			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1063	2244			1101	492		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.72	0.34			0.36	0.54		0.66	0.20			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	690	695	0	0	355	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	767	772	0	0	394	264	267	1	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	767	772	0	0	394	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	22.1	52.2			25.6	25.6		15.8	15.8			
Effective Green, g (s)	22.1	52.2			25.6	25.6		15.8	15.8			
Actuated g/C Ratio	0.28	0.65			0.32	0.32		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	921	2243			1100	492		340	304			
v/s Ratio Prot	c0.23	0.22			0.11							
v/s Ratio Perm						c0.17		0.16	0.05			
v/c Ratio	0.83	0.34			0.36	0.54		0.79	0.24			
Uniform Delay, d1	27.2	6.2			20.9	22.3		30.5	27.0			
Progression Factor	0.44	0.24			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.6	0.3			0.9	4.2		10.6	0.1			
Delay (s)	17.6	1.9			21.8	26.5		41.1	27.2			
Level of Service	B	A			C	C		D	C			
Approach Delay (s)		9.7			23.7			38.2			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	230	45	30	95	275	55	825	90	120	270	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	155		200	150		175	150		200
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		0.99		0.98	1.00		0.98	1.00		0.97
Frt		0.975				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1760	0	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.539			0.574			0.569			0.166		
Satd. Flow (perm)	972	1760	0	1032	1810	1505	1026	3438	1513	300	3438	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	422	256	50	33	106	153	61	917	50	133	300	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	422	306	0	33	106	153	61	917	50	133	300	75
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	20.0	40.0	0.0	20.0	20.0	20.0	12.0	38.0	38.0	12.0	38.0	38.0
Total Split (%)	22.2%	44.4%	0.0%	22.2%	22.2%	22.2%	13.3%	42.2%	42.2%	13.3%	42.2%	42.2%
Maximum Green (s)	16.5	34.0		14.0	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

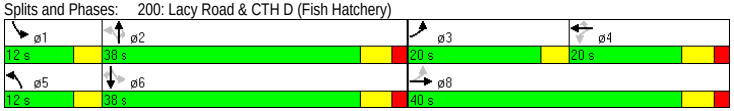
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.80	0.47		0.23	0.42	0.73	0.11	0.71	0.09	0.49	0.21	0.12
Control Delay	35.5	24.4		37.9	40.2	57.2	11.7	28.2	19.9	25.0	15.8	16.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	24.4		37.9	40.2	57.2	11.7	28.2	19.9	25.0	15.8	16.4
90th %ile Green (s)	16.5	34.0		14.0	14.0	14.0	7.8	32.0	32.0	8.5	32.7	32.7
90th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	16.5	34.0		14.0	14.0	14.0	6.8	32.0	32.0	8.5	33.7	33.7
70th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	17.2	34.4		13.7	13.7	13.7	6.1	32.0	32.0	8.1	34.0	34.0
50th %ile Term Code	Max	Hold		Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	19.3	34.1		11.3	11.3	11.3	6.0	33.4	33.4	7.0	34.4	34.4
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Min	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	15.4	28.9		10.0	10.0	10.0	0.0	39.6	39.6	6.0	49.1	49.1
10th %ile Term Code	Gap	Hold		Min	Min	Min	Skip	Coord	Coord	Min	Coord	Coord
Queue Length 50th (ft)	183	128		17	55	83	17	237	19	26	51	24
Queue Length 95th (ft)	#317	203		44	105	#164	36	311	44	105	77	50
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300			155		200	150		175	150		200
Base Capacity (vph)	527	667		161	282	234	576	1291	568	288	1405	612
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46		0.20	0.38	0.65	0.11	0.71	0.09	0.46	0.21	0.12

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	230	45	30	95	275	55	825	90	120	270	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1716	1761		1707	1810	1503	1715	3438	1514	1719	3438	1498
Flt Permitted	0.54	1.00		0.57	1.00	1.00	0.57	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	973	1761		1031	1810	1503	1027	3438	1514	300	3438	1498
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	422	256	50	33	106	153	61	917	50	133	300	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	422	306	0	33	106	153	61	917	50	133	300	75
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	33.1	33.1		12.6	12.6	12.6	39.1	33.8	33.8	43.7	36.1	36.1
Effective Green, g (s)	33.1	33.1		12.6	12.6	12.6	39.1	33.8	33.8	43.7	36.1	36.1
Actuated g/C Ratio	0.37	0.37		0.14	0.14	0.14	0.43	0.38	0.38	0.49	0.40	0.40
Clearance Time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	498	648		144	253	210	487	1291	569	265	1379	601
v/s Ratio Prot	c0.16	0.17			0.06		0.01	c0.27		c0.04	0.09	
v/s Ratio Perm	c0.15			0.03		0.10	0.05		0.03	0.20		0.05
v/c Ratio	0.85	0.47		0.23	0.42	0.73	0.13	0.71	0.09	0.50	0.22	0.12
Uniform Delay, d1	24.3	21.8		34.4	35.4	37.1	14.9	23.9	18.1	15.0	17.7	17.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.64	0.83	0.84
Incremental Delay, d2	12.1	0.2		0.3	0.4	10.2	0.0	3.3	0.3	0.5	0.4	0.4
Delay (s)	36.4	22.0		34.7	35.8	47.3	15.0	27.3	18.5	25.1	15.0	14.7
Level of Service	D	C		C	D	D	B	C	B	C	B	B
Approach Delay (s)		30.3			41.7			26.1			17.6	
Approach LOS		C			D			C			B	

Intersection Summary

HCM Average Control Delay	27.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	70.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Volume
210: Lacy Road & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	210	195	85	195	15	135	30	30	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.989			0.979			0.962	
Flt Protected		0.984		0.950				0.966			0.986	
Satd. Flow (prot)	0	1781	1538	1719	1790	0	0	1711	0	0	1716	0
Flt Permitted		0.984		0.950				0.966			0.986	
Satd. Flow (perm)	0	1781	1538	1719	1790	0	0	1711	0	0	1716	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	233	217	94	217	17	150	33	33	11	17	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	350	217	94	234	0	0	216	0	0	39	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	105	210	195	85	195	15	135	30	30	10	15	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	117	233	217	94	217	17	150	33	33	11	17	11

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	350	217	94	233	217	39
Volume Left (vph)	117	0	94	0	150	11
Volume Right (vph)	0	217	0	17	33	11
Hadj (s)	0.25	-0.61	0.58	0.03	0.13	-0.03
Departure Headway (s)	6.1	5.2	6.7	6.1	6.2	6.5
Degree Utilization, x	0.59	0.31	0.18	0.40	0.37	0.07
Capacity (veh/h)	574	670	512	563	539	479
Control Delay (s)	16.2	9.3	9.9	11.9	12.7	10.0
Approach Delay (s)	13.6		11.3		12.7	10.0
Approach LOS	B		B		B	A

Intersection Summary					
Delay	12.7				
HCM Level of Service	B				
Intersection Capacity Utilization	56.0%	ICU Level of Service		B	
Analysis Period (min)	15				

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	165	10	1	225	40	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.896	
Flt Protected			0.950		0.989	
Satd. Flow (prot)	1810	1538	1719	1810	1603	0
Flt Permitted			0.950		0.989	
Satd. Flow (perm)	1810	1538	1719	1810	1603	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	183	11	1	250	44	150
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	11	1	250	194	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	165	10	1	225	40	135
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	183	11	1	250	44	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			194		436	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			194		436	183
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	82
cM capacity (veh/h)			1361		572	851

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	183	11	1	250	194
Volume Left	0	0	1	0	44
Volume Right	0	11	0	0	150
cSH	1700	1700	1361	1700	766
Volume to Capacity	0.11	0.01	0.00	0.15	0.25
Queue Length 95th (ft)	0	0	0	0	25
Control Delay (s)	0.0	0.0	7.6	0.0	11.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		11.3
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		29.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	275	380	20	15	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1806	1810	1538	1646	0
Flt Permitted		0.998			0.976	
Satd. Flow (perm)	0	1806	1810	1538	1646	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	306	422	22	17	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	317	422	22	34	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	275	380	20	15	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	306	422	22	17	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			991			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	444				750	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	433				742	410
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1099				371	628

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	317	422	22	33
Volume Left	11	0	0	17
Volume Right	0	0	22	17
cSH	1099	1700	1700	466
Volume to Capacity	0.01	0.25	0.01	0.07
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	0.4	0.0	0.0	13.3
Lane LOS	A			B
Approach Delay (s)	0.4	0.0		13.3
Approach LOS				B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		32.6%	ICU Level of Service A
Analysis Period (min)		15	

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	130	1	180	325	50	20	410	380	10	75	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		0.99	1.00		0.99		0.97	1.00		0.97
Frt		0.999			0.980				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1807	0	1719	1767	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.449			0.665			0.703			0.358		
Satd. Flow (perm)	810	1807	0	1197	1767	0	1265	1810	1498	646	1810	1498
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	178	144	1	200	361	56	22	456	211	11	83	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	145	0	200	417	0	22	456	211	11	83	31
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.0	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

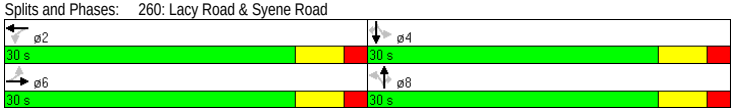
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.55	0.20		0.41	0.59		0.05	0.74	0.41	0.05	0.13	0.06
Control Delay	20.2	11.5		14.9	16.4		11.6	22.5	15.4	11.9	12.0	11.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	11.5		14.9	16.4		11.6	22.5	15.4	11.9	12.0	11.6
90th %ile Green (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	24.0	24.0		24.0	24.0		22.0	22.0	22.0	22.0	22.0	22.0
70th %ile Term Code	Max	Max		Max	Max		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	20.3	20.3		20.3	20.3		16.8	16.8	16.8	16.8	16.8	16.8
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	15.2	15.2		15.2	15.2		12.6	12.6	12.6	12.6	12.6	12.6
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
10th %ile Term Code	Min	Min		Min	Min		Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	36	25		38	86		4	111	45	2	16	6
Queue Length 95th (ft)	106	66		100	194		16	214	98	11	41	20
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	414	923		611	903		646	925	765	330	925	765
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.16		0.33	0.46		0.03	0.49	0.28	0.03	0.09	0.04

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 48.8
Natural Cycle: 50
Control Type: Semi Act-Uncoord
90th %ile Actuated Cycle: 60
70th %ile Actuated Cycle: 58
50th %ile Actuated Cycle: 49.1
30th %ile Actuated Cycle: 39.8
10th %ile Actuated Cycle: 37

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	130	1	180	325	50	20	410	380	10	75	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1714	1807		1710	1767		1708	1810	1496	1713	1810	1496
Flt Permitted	0.45	1.00		0.66	1.00		0.70	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	809	1807		1197	1767		1264	1810	1496	645	1810	1496
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	178	144	1	200	361	56	22	456	211	11	83	31
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	178	145	0	200	417	0	22	456	211	11	83	31
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	19.7	19.7		19.7	19.7		16.7	16.7	16.7	16.7	16.7	16.7
Effective Green, g (s)	19.7	19.7		19.7	19.7		16.7	16.7	16.7	16.7	16.7	16.7
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.35	0.35	0.35	0.35	0.35	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	329	735		487	719		436	625	516	223	625	516
v/s Ratio Prot		0.08			c0.24			c0.25			0.05	
v/s Ratio Perm	0.22			0.17			0.02		0.14	0.02		0.02
v/c Ratio	0.54	0.20		0.41	0.58		0.05	0.73	0.41	0.05	0.13	0.06
Uniform Delay, d1	10.9	9.3		10.2	11.1		10.6	13.9	12.1	10.6	10.9	10.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.3		1.2	1.8		0.0	3.6	0.2	0.0	0.0	0.0
Delay (s)	14.1	9.5		11.4	13.0		10.6	17.5	12.3	10.6	10.9	10.6
Level of Service	B	A		B	B		B	B	B	B	B	B
Approach Delay (s)		12.0			12.4			15.7			10.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
270: Lacy Road & New Lacy Road

1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	250	270	295	20	20	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1795	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1795	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	278	300	328	22	22	289
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	300	350	0	22	289
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	250	270	295	20	20	260
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	278	300	328	22	22	289
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		753				
pX, platoon unblocked						
vC, conflicting volume	355				1204	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				1204	349
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	77				85	58
cM capacity (veh/h)	1182				152	682

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	278	300	350	22	289
Volume Left	278	0	0	22	0
Volume Right	0	0	22	0	289
cSH	1182	1700	1700	152	682
Volume to Capacity	0.23	0.18	0.21	0.15	0.42
Queue Length 95th (ft)	23	0	0	12	53
Control Delay (s)	9.0	0.0	0.0	32.7	14.1
Lane LOS	A			D	B
Approach Delay (s)	4.3		0.0	15.4	
Approach LOS				C	

Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		45.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	15	10	5	25	5	1065	55	120	245	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.969		0.950			0.950		
Satd. Flow (prot)	0	1732	1538	0	1753	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.957			0.969		0.950			0.950		
Satd. Flow (perm)	0	1732	1538	0	1753	1538	1719	3438	1538	1719	3438	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	17	11	6	28	6	1183	61	133	272	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	17	0	17	28	6	1183	61	133	272	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	5	15	10	5	25	5	1065	55	120	245	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	6	17	11	6	28	6	1183	61	133	272	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1182	1804	146	1627	1766	602	299			1249		
vC1, stage 1 conf vol	544	544		1199	1199							
vC2, stage 2 conf vol	638	1261		427	566							
vCu, unblocked vol	1182	1804	146	1627	1766	602	299			1249		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	94	98	94	97	94	100			75		
cM capacity (veh/h)	220	96	858	172	208	432	1232			534		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	56	17	17	28	6	592	592	61	133	136	136	22
Volume Left	50	0	11	0	6	0	0	0	133	0	0	0
Volume Right	0	17	0	28	0	0	0	61	0	0	0	22
cSH	195	858	182	432	1232	1700	1700	1700	534	1700	1700	1700
Volume to Capacity	0.29	0.02	0.09	0.06	0.00	0.35	0.35	0.04	0.25	0.08	0.08	0.01
Queue Length 95th (ft)	28	1	7	5	0	0	0	0	24	0	0	0
Control Delay (s)	30.7	9.3	26.7	13.9	7.9	0.0	0.0	0.0	14.0	0.0	0.0	0.0
Lane LOS	D	A	D	B	A				B			
Approach Delay (s)	25.7		18.7		0.0				4.4			
Approach LOS	D		C									

Intersection Summary					
Average Delay		2.6			
Intersection Capacity Utilization		56.1%	ICU Level of Service		B
Analysis Period (min)		15			

Volume
310: Nobel Drive & Research Park Drive

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	70	35	10	10	1	10	1	25	10	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.950			0.988			0.906			0.941	
Flt Protected	0.950			0.950				0.986			0.986	
Satd. Flow (prot)	1719	1719	0	1719	1788	0	0	1616	0	0	1679	0
Flt Permitted	0.950			0.950				0.986			0.986	
Satd. Flow (perm)	1719	1719	0	1719	1788	0	0	1616	0	0	1679	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	78	39	11	11	1	11	1	28	11	11	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	117	0	11	12	0	0	40	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	70	35	10	10	1	10	1	25	10	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	78	39	11	11	1	11	1	28	11	11	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			122			263	242	107	250	261	22
vC1, stage 1 conf vol							202	202		39	39	
vC2, stage 2 conf vol							61	39		211	222	
vCu, unblocked vol	17			122			263	242	107	250	261	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	100	97	98	98	98
cM capacity (veh/h)	1574			1441			724	676	931	701	657	1038

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	117	11	12	40	39
Volume Left	50	0	11	0	11	11
Volume Right	0	39	0	1	28	17
cSH	1574	1700	1441	1700	854	797
Volume to Capacity	0.03	0.07	0.01	0.01	0.05	0.05
Queue Length 95th (ft)	2	0	1	0	4	4
Control Delay (s)	7.4	0.0	7.5	0.0	9.4	9.7
Lane LOS	A		A		A	A
Approach Delay (s)	2.2		3.6		9.4	9.7
Approach LOS					A	A

Intersection Summary					
Average Delay	4.5				
Intersection Capacity Utilization	21.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	20	205	725	40	55	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	22	228	806	44	61	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	228	806	44	61	183
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	205	725	40	55	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	228	806	44	61	183
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1029	413			855	
vC1, stage 1 conf vol	811					
vC2, stage 2 conf vol	219					
vCu, unblocked vol	1029	413			855	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	60			92	
cM capacity (veh/h)	364	575			759	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	22	228	403	403	44	61	92	92
Volume Left	22	0	0	0	0	61	0	0
Volume Right	0	228	0	0	44	0	0	0
cSH	364	575	1700	1700	1700	759	1700	1700
Volume to Capacity	0.06	0.40	0.24	0.24	0.03	0.08	0.05	0.05
Queue Length 95th (ft)	5	47	0	0	0	7	0	0
Control Delay (s)	15.5	15.3	0.0	0.0	0.0	10.2	0.0	0.0
Lane LOS	C	C				B		
Approach Delay (s)	15.3		0.0			2.5		
Approach LOS	C							

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	155	1	1	195	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.900	
Flt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Flt Permitted					0.987	
Satd. Flow (perm)	1808	0	0	1810	1607	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	172	1	1	217	6	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	173	0	0	218	23	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill

1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	155	1	1	195	5	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	172	1	1	217	6	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			173		392	173
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			173		392	173
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1385		606	863

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	173	218	22
Volume Left	0	1	6
Volume Right	1	0	17
cSH	1700	1385	780
Volume to Capacity	0.10	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

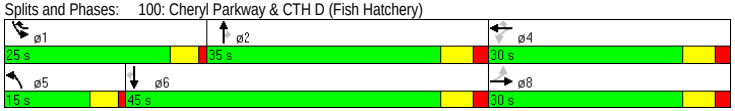
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	735	5	610	15	385	1330	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.99	1.00		0.98	1.00		0.97
Frt		0.882				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1574	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.739			0.739			0.950			0.950		
Satd. Flow (perm)	1330	1574	0	1330	1810	1515	1714	3438	1513	3321	3438	1499
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	22	233	28	408	6	678	8	428	1478	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	28	0	233	28	408	6	678	8	428	1478	53
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	25.0	15.0	35.0	35.0	25.0	45.0	45.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	27.8%	16.7%	38.9%	38.9%	27.8%	50.0%	50.0%
Maximum Green (s)	24.0	24.0		24.0	24.0	20.5	10.5	29.0	29.0	20.5	39.0	39.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.18	0.08		0.82	0.07	0.66	0.04	0.46	0.01	0.73	0.69	0.06
Control Delay	28.4	26.6		56.1	26.3	22.8	29.6	22.2	17.1	42.3	15.6	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	26.6		56.1	26.3	22.8	29.6	22.2	17.1	42.3	15.6	9.7
90th %ile Green (s)	24.0	24.0		24.0	24.0	20.5	8.0	29.0	29.0	20.5	41.5	41.5
90th %ile Term Code	Hold	Hold		Max	Max	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	23.3	23.3		23.3	23.3	17.7	0.0	32.5	32.5	17.7	54.7	54.7
70th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	20.1	20.1		20.1	20.1	15.8	0.0	37.6	37.6	15.8	57.9	57.9
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	16.7	16.7		16.7	16.7	14.0	0.0	42.8	42.8	14.0	61.3	61.3
30th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	11.8	11.8		11.8	11.8	11.4	0.0	50.3	50.3	11.4	66.2	66.2
10th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	23	13		125	13	163	3	161	3	120	247	10
Queue Length 95th (ft)	51	33		200	33	203	m9	236	m10	159	#564	37
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	355	420		355	483	699	201	1468	646	760	2152	938
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07		0.66	0.06	0.58	0.03	0.46	0.01	0.56	0.69	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	735	5	610	15	385	1330	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1707	1573		1707	1810	1525	1719	3438	1514	3335	3438	1501
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1328	1573		1328	1810	1525	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	50	6	22	233	28	408	6	678	8	428	1478	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	50	28	0	233	28	408	6	678	8	428	1478	53
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	19.2	19.2		19.2	19.2	35.1	1.6	38.4	38.4	15.9	52.7	52.7
Effective Green, g (s)	19.2	19.2		19.2	19.2	35.1	1.6	38.4	38.4	15.9	52.7	52.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.39	0.02	0.43	0.43	0.18	0.59	0.59
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	283	336		283	386	595	31	1467	646	589	2013	879
v/s Ratio Prot		0.02			0.02	0.12	0.00	0.20		c0.13	c0.43	
v/s Ratio Perm	0.04			c0.18		0.15			0.01			0.04
v/c Ratio	0.18	0.08		0.82	0.07	0.69	0.19	0.46	0.01	0.73	0.73	0.06
Uniform Delay, d1	28.9	28.4		33.8	28.3	22.9	43.6	18.4	14.9	35.0	13.6	8.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.77	1.04	0.88	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0		16.6	0.0	2.6	1.1	1.0	0.0	3.8	2.4	0.1
Delay (s)	29.0	28.4		50.4	28.3	25.5	34.8	20.1	13.1	38.8	16.0	8.1
Level of Service	C	C		D	C	C	C	C	B	D	B	A
Approach Delay (s)		28.8			34.3			20.1			20.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

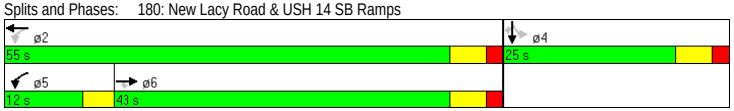
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1040	210	75	335	0	0	0	0	375	1	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.153						0.950	0.953	
Satd. Flow (perm)	0	4451	1538	277	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1156	117	83	372	0	0	0	0	417	1	518
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1156	117	83	372	0	0	0	0	208	210	518
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.49	0.14	0.28	0.17					0.57	0.57	0.85
Control Delay		14.0	11.8	4.5	1.4					34.0	34.1	44.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		14.0	11.8	4.5	1.4					34.0	34.1	44.5
90th %ile Green (s)		38.1	38.1	7.4	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
70th %ile Green (s)		39.0	39.0	6.5	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
30th %ile Green (s)		40.0	40.0	6.0	49.5					18.5	18.5	18.5
30th %ile Term Code		Coord	Coord	Min	Coord					Gap	Gap	Gap
10th %ile Green (s)		53.7	53.7	0.0	53.7					14.3	14.3	14.3
10th %ile Term Code		Coord	Coord	Skip	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		152	30	35	43					95	96	139
Queue Length 95th (ft)		202	61	0	0					166	168	#222
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		2340	808	335	2151					388	389	643
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.49	0.14	0.25	0.17					0.54	0.54	0.81

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
* User Entered Value	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1040	210	75	335	0	0	0	0	375	1	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438					1633	1638	2707
Flt Permitted		1.00	1.00	0.15	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4451	1538	277	3438					1633	1638	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1156	117	83	372	0	0	0	0	417	1	518
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1156	117	83	372	0	0	0	0	208	210	518
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		41.3	41.3	50.0	50.0					18.0	18.0	18.0
Effective Green, g (s)		41.3	41.3	50.0	50.0					18.0	18.0	18.0
Actuated g/C Ratio		0.52	0.52	0.62	0.62					0.22	0.22	0.22
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		2298	794	267	2149					367	369	609
v/s Ratio Prot		c0.26		c0.02	0.11							
v/s Ratio Perm			0.08	0.17						0.13	0.13	c0.19
v/c Ratio		0.50	0.15	0.31	0.17					0.57	0.57	0.85
Uniform Delay, d1		12.6	10.1	6.9	6.3					27.5	27.6	29.7
Progression Factor		1.00	1.00	0.41	0.19					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.4	0.2	0.2					1.2	1.2	10.6
Delay (s)		13.4	10.5	3.1	1.3					28.7	28.8	40.3
Level of Service		B	B	A	A					C	C	D
Approach Delay (s)		13.2			1.7			0.0			35.2	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

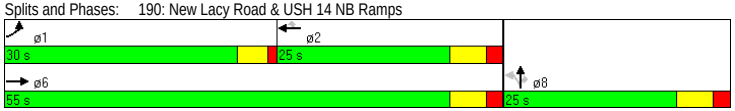
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	845	570	0	0	245	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	939	633	0	0	272	183	183	1	50	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	939	633	0	0	272	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.27			0.26	0.39		0.64	0.19			
Control Delay	22.5	1.7			23.5	27.2		41.0	29.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	22.5	1.7			23.5	27.2		41.0	29.1			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	27.1	55.1			23.5	23.5	12.9	12.9	12.9			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	25.0	57.3			27.8	27.8	10.7	10.7	10.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	21.5	58.0			32.0	32.0	10.0	10.0	10.0			
10th %ile Term Code	Gap	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	216	10			54	73		87	22			
Queue Length 95th (ft)	#323	34			93	142		142	48			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1117	2348			1043	466		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.84	0.27			0.26	0.39		0.45	0.14			

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 55 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	845	570	0	0	245	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	939	633	0	0	272	183	183	1	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	939	633	0	0	272	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	25.9	54.6			24.2	24.2		13.4	13.4			
Effective Green, g (s)	25.9	54.6			24.2	24.2		13.4	13.4			
Actuated g/C Ratio	0.32	0.68			0.30	0.30		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1080	2346			1040	465		289	258			
v/s Ratio Prot	c0.28	0.18			0.08							
v/s Ratio Perm						c0.12		0.11	0.03			
v/c Ratio	0.87	0.27			0.26	0.39		0.64	0.19			
Uniform Delay, d1	25.5	4.9			21.1	22.1		31.0	28.7			
Progression Factor	0.51	0.27			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.6	0.2			0.6	2.5		3.4	0.1			
Delay (s)	19.7	1.6			21.7	24.6		34.4	28.8			
Level of Service	B	A			C	C		C	C			
Approach Delay (s)		12.4			22.9			33.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	135	75	115	240	195	85	340	50	310	870	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	155		200	150		175	150		200
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00		0.98	1.00		0.97
Frt		0.947				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1704	0	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.288			0.613			0.238			0.457		
Satd. Flow (perm)	520	1704	0	1104	1810	1509	430	3438	1511	826	3438	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	150	83	128	267	108	94	378	28	344	967	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	233	0	128	267	108	94	378	28	344	967	228
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	15.0	40.0	0.0	25.0	25.0	25.0	12.0	30.0	30.0	20.0	38.0	38.0
Total Split (%)	16.7%	44.4%	0.0%	27.8%	27.8%	27.8%	13.3%	33.3%	33.3%	22.2%	42.2%	42.2%
Maximum Green (s)	11.5	34.0		19.0	19.0	19.0	8.5	24.0	24.0	16.5	32.0	32.0
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

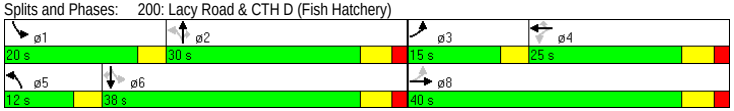
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.47	0.42		0.63	0.80	0.39	0.32	0.31	0.05	0.57	0.63	0.34
Control Delay	24.6	25.3		47.7	53.4	35.8	14.2	24.2	24.0	9.8	16.7	13.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	25.3		47.7	53.4	35.8	14.2	24.2	24.0	9.8	16.7	13.2
90th %ile Green (s)	11.5	34.0		19.0	19.0	19.0	8.5	24.0	24.0	16.5	32.0	32.0
90th %ile Term Code	Max	Hold		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	10.9	34.0		19.6	19.6	19.6	7.9	24.0	24.0	16.5	32.6	32.6
70th %ile Term Code	Gap	Hold		Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	9.7	30.9		17.7	17.7	17.7	6.8	29.0	29.0	14.6	36.8	36.8
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	7.7	26.3		15.1	15.1	15.1	6.0	36.7	36.7	11.5	42.2	42.2
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Min	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	6.2	21.0		11.3	11.3	11.3	0.0	45.2	45.2	8.3	57.0	57.0
10th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	55	100		67	144	54	24	85	11	97	252	99
Queue Length 95th (ft)	93	155		125	#241	100	51	134	33	44	243	m85
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300			155		200	150		175	150		200
Base Capacity (vph)	337	644		234	384	321	326	1214	534	634	1532	667
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.36		0.55	0.70	0.34	0.29	0.31	0.05	0.54	0.63	0.34

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	135	75	115	240	195	85	340	50	310	870	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1703		1709	1810	1507	1719	3438	1513	1718	3438	1499
Flt Permitted	0.29	1.00		0.61	1.00	1.00	0.24	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	522	1703		1103	1810	1507	431	3438	1513	826	3438	1499
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	144	150	83	128	267	108	94	378	28	344	967	228
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	233	0	128	267	108	94	378	28	344	967	228
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	29.2	29.2		16.5	16.5	16.5	37.6	31.8	31.8	48.8	39.5	39.5
Effective Green, g (s)	29.2	29.2		16.5	16.5	16.5	37.6	31.8	31.8	48.8	39.5	39.5
Actuated g/C Ratio	0.32	0.32		0.18	0.18	0.18	0.42	0.35	0.35	0.54	0.44	0.44
Clearance Time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	292	553		202	332	276	263	1215	535	582	1509	658
v/s Ratio Prot	c0.05	0.14			c0.15		0.02	0.11		c0.09	c0.28	
v/s Ratio Perm	0.11			0.12		0.07	0.13		0.02	0.23		0.15
v/c Ratio	0.49	0.42		0.63	0.80	0.39	0.36	0.31	0.05	0.59	0.64	0.35
Uniform Delay, d1	23.1	23.8		34.0	35.2	32.3	16.4	21.1	19.2	12.0	19.7	16.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.59	0.70	0.63
Incremental Delay, d2	0.5	0.2		4.7	12.5	0.3	0.3	0.7	0.2	0.8	1.5	1.1
Delay (s)	23.6	24.0		38.7	47.7	32.7	16.7	21.8	19.4	7.9	15.4	11.5
Level of Service	C	C		D	D	C	B	C	B	A	B	B
Approach Delay (s)		23.8			42.2			20.7			13.2	
Approach LOS		C			D			C			B	

Intersection Summary

HCM Average Control Delay	20.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Volume
210: Lacy Road & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	250	150	25	265	10	220	15	75	20	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.967			0.904	
Flt Protected		0.994		0.950				0.966			0.994	
Satd. Flow (prot)	0	1799	1538	1719	1800	0	0	1690	0	0	1626	0
Flt Permitted		0.994		0.950				0.966			0.994	
Satd. Flow (perm)	0	1799	1538	1719	1800	0	0	1690	0	0	1626	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		679			2215			491			1394	
Travel Time (s)		13.2			43.1			11.2			31.7	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	278	167	28	294	11	244	17	83	22	33	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	317	167	28	305	0	0	344	0	0	188	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Lacy Road & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	35	250	150	25	265	10	220	15	75	20	30	120
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	278	167	28	294	11	244	17	83	22	33	133

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	317	167	28	306	344	189
Volume Left (vph)	39	0	28	0	244	22
Volume Right (vph)	0	167	0	11	83	133
Hadj (s)	0.15	-0.61	0.58	0.06	0.08	-0.31
Departure Headway (s)	7.4	6.6	8.0	7.5	7.0	7.1
Degree Utilization, x	0.65	0.31	0.06	0.64	0.67	0.37
Capacity (veh/h)	465	514	418	450	488	437
Control Delay (s)	21.9	11.3	10.4	21.5	22.7	14.3
Approach Delay (s)	18.3		20.6		22.7	14.3
Approach LOS	C		C		C	B

Intersection Summary					
Delay	19.4				
HCM Level of Service	C				
Intersection Capacity Utilization	71.6%	ICU Level of Service		C	
Analysis Period (min)	15				

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	265	45	185	210	20	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.901	
Flt Protected			0.950		0.987	
Satd. Flow (prot)	1810	1538	1719	1810	1609	0
Flt Permitted			0.950		0.987	
Satd. Flow (perm)	1810	1538	1719	1810	1609	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	294	50	206	233	22	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	294	50	206	233	83	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	265	45	185	210	20	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	294	50	206	233	22	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			344		939	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			344		939	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		91	92
cM capacity (veh/h)			1198		240	738

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	294	50	206	233	83
Volume Left	0	0	206	0	22
Volume Right	0	50	0	0	61
cSH	1700	1700	1198	1700	475
Volume to Capacity	0.17	0.03	0.17	0.14	0.18
Queue Length 95th (ft)	0	0	15	0	16
Control Delay (s)	0.0	0.0	8.6	0.0	14.2
Lane LOS			A		B
Approach Delay (s)	0.0		4.0		14.2
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		38.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	410	325	15	25	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.962	
Flt Protected		0.999			0.965	
Satd. Flow (prot)	0	1808	1810	1538	1680	0
Flt Permitted		0.999			0.965	
Satd. Flow (perm)	0	1808	1810	1538	1680	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	456	361	17	28	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	467	361	17	39	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	410	325	15	25	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	456	361	17	28	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			991			
pX, platoon unblocked						
vC, conflicting volume	378				839	361
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	378				839	361
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	98
cM capacity (veh/h)	1164				329	677

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	467	361	17	39
Volume Left	11	0	0	28
Volume Right	0	0	17	11
cSH	1164	1700	1700	385
Volume to Capacity	0.01	0.21	0.01	0.10
Queue Length 95th (ft)	1	0	0	8
Control Delay (s)	0.3	0.0	0.0	15.4
Lane LOS	A			C
Approach Delay (s)	0.3	0.0		15.4
Approach LOS				C

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		39.6%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
260: Lacy Road & Syene Road 1/7/2009

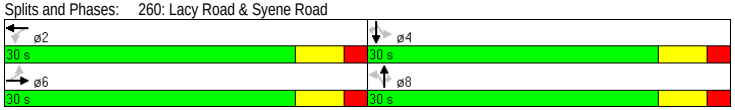
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	335	35	180	145	20	20	80	1	60	470	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00		0.97	0.99		0.97
Frt		0.986			0.982				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1780	0	1719	1771	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.642			0.445			0.288			0.699		
Satd. Flow (perm)	1156	1780	0	803	1771	0	520	1810	1498	1258	1810	1498
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	72	372	39	200	161	22	22	89	1	67	522	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	411	0	200	183	0	22	89	1	67	522	97
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.0	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.16	0.58		0.63	0.26		0.12	0.14	0.00	0.15	0.80	0.18
Control Delay	12.2	17.0		24.9	12.6		13.2	11.9	11.0	12.3	25.8	12.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	17.0		24.9	12.6		13.2	11.9	11.0	12.3	25.8	12.5
90th %ile Green (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
90th %ile Term Code	Max	Max		Max	Max		Hold	Hold	Hold	Max	Max	Max
70th %ile Green (s)	24.0	24.0		24.0	24.0		24.0	24.0	24.0	24.0	24.0	24.0
70th %ile Term Code	Max	Max		Max	Max		Hold	Hold	Hold	Max	Max	Max
50th %ile Green (s)	21.9	21.9		21.9	21.9		20.0	20.0	20.0	20.0	20.0	20.0
50th %ile Term Code	Hold	Hold		Gap	Gap		Hold	Hold	Hold	Gap	Gap	Gap
30th %ile Green (s)	15.5	15.5		15.5	15.5		14.6	14.6	14.6	14.6	14.6	14.6
30th %ile Term Code	Gap	Gap		Gap	Gap		Hold	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	15.0	15.0		15.0	15.0		10.4	10.4	10.4	10.4	10.4	10.4
10th %ile Term Code	Min	Min		Min	Min		Hold	Hold	Hold	Gap	Gap	Gap
Queue Length 50th (ft)	14	97		48	37		4	18	0	14	142	20
Queue Length 95th (ft)	39	190		#141	81		18	44	3	37	#261	48
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	568	875		395	870		256	889	736	618	889	736
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47		0.51	0.21		0.09	0.10	0.00	0.11	0.59	0.13

Intersection Summary
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 50.7
Natural Cycle: 55
Control Type: Semi Act-Uncoord
90th %ile Actuated Cycle: 60
70th %ile Actuated Cycle: 60
50th %ile Actuated Cycle: 53.9
30th %ile Actuated Cycle: 42.1
10th %ile Actuated Cycle: 37.4
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	335	35	180	145	20	20	80	1	60	470	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	1779		1713	1771		1714	1810	1497	1709	1810	1497
Flt Permitted	0.64	1.00		0.44	1.00		0.29	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1156	1779		802	1771		519	1810	1497	1258	1810	1497
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	72	372	39	200	161	22	22	89	1	67	522	97
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	72	411	0	200	183	0	22	89	1	67	522	97
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	20.0	20.0		20.0	20.0		18.2	18.2	18.2	18.2	18.2	18.2
Effective Green, g (s)	20.0	20.0		20.0	20.0		18.2	18.2	18.2	18.2	18.2	18.2
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	461	709		320	706		188	656	543	456	656	543
v/s Ratio Prot		0.23			0.10			0.05			c0.29	
v/s Ratio Perm	0.06			c0.25			0.04		0.00	0.05		0.06
v/c Ratio	0.16	0.58		0.62	0.26		0.12	0.14	0.00	0.15	0.80	0.18
Uniform Delay, d1	9.7	11.8		12.1	10.1		10.7	10.7	10.2	10.8	14.3	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.8		5.3	0.4		0.1	0.0	0.0	0.1	6.2	0.1
Delay (s)	10.0	13.7		17.4	10.5		10.8	10.8	10.2	10.8	20.5	11.0
Level of Service	B	B		B	B		B	B	B	B	C	B
Approach Delay (s)		13.1			14.1			10.8			18.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
270: Lacy Road & New Lacy Road

1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	190	205	185	15	15	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1791	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1791	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	211	228	206	17	17	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	211	228	223	0	17	178
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	190	205	185	15	15	160
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	228	206	17	17	178
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		753				
pX, platoon unblocked						
vC, conflicting volume	227				874	224
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227				874	224
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				94	78
cM capacity (veh/h)	1318				264	801

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	211	228	222	17	178
Volume Left	211	0	0	17	0
Volume Right	0	0	17	0	178
cSH	1318	1700	1700	264	801
Volume to Capacity	0.16	0.13	0.13	0.06	0.22
Queue Length 95th (ft)	14	0	0	5	21
Control Delay (s)	8.3	0.0	0.0	19.6	10.8
Lane LOS	A			C	B
Approach Delay (s)	4.0		0.0	11.5	
Approach LOS				B	

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	5	60	5	120	5	380	20	25	1160	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.956		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1730	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.954			0.956		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1730	1538	1719	3438	1538	1719	3438	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	6	67	6	133	6	422	22	28	1289	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	6	0	73	133	6	422	22	28	1289	50
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	5	60	5	120	5	380	20	25	1160	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	6	67	6	133	6	422	22	28	1289	50
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1713	1810	654	1149	1838	221	1344			449		
vC1, stage 1 conf vol	1349	1349		438	438							
vC2, stage 2 conf vol	363	461		711	1399							
vCu, unblocked vol	1713	1810	654	1149	1838	221	1344			449		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	99	99	79	97	83	99			97		
cM capacity (veh/h)	141	192	399	317	179	767	491			1082		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	23	6	72	133	6	211	211	22	28	644	644	50
Volume Left	22	0	67	0	6	0	0	0	28	0	0	0
Volume Right	0	6	0	133	0	0	0	22	0	0	0	50
cSH	143	399	299	767	491	1700	1700	1700	1082	1700	1700	1700
Volume to Capacity	0.16	0.01	0.24	0.17	0.01	0.12	0.12	0.01	0.03	0.38	0.38	0.03
Queue Length 95th (ft)	14	1	23	16	1	0	0	0	2	0	0	0
Control Delay (s)	35.0	14.2	20.8	10.7	12.4	0.0	0.0	0.0	8.4	0.0	0.0	0.0
Lane LOS	D	B	C	B	B				A			
Approach Delay (s)	31.0		14.2		0.2				0.2			
Approach LOS	D		B									

Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			52.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Volume
310: Nobel Drive & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	10	1	1	140	10	10	1	1	10	1	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.990			0.990			0.887	
Flt Protected	0.950			0.950				0.959			0.993	
Satd. Flow (prot)	1719	1788	0	1719	1791	0	0	1718	0	0	1594	0
Flt Permitted	0.950			0.950				0.959			0.993	
Satd. Flow (perm)	1719	1788	0	1719	1791	0	0	1718	0	0	1594	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	11	1	1	156	11	11	1	1	11	1	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	12	0	1	167	0	0	13	0	0	73	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	10	1	1	140	10	10	1	1	10	1	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	11	1	1	156	11	11	1	1	11	1	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	172			17			297	246	22	242	241	171
vC1, stage 1 conf vol							72	72		168	168	
vC2, stage 2 conf vol							224	174		73	73	
vCu, unblocked vol	172			17			297	246	22	242	241	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	100	99	100	93
cM capacity (veh/h)	1382			1574			661	689	1038	776	709	858

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	28	12	1	167	13	73
Volume Left	28	0	1	0	11	11
Volume Right	0	1	0	11	1	61
cSH	1382	1700	1574	1700	684	842
Volume to Capacity	0.02	0.01	0.00	0.10	0.02	0.09
Queue Length 95th (ft)	2	0	0	0	1	7
Control Delay (s)	7.7	0.0	7.3	0.0	10.4	9.7
Lane LOS	A		A		B	A
Approach Delay (s)	5.3		0.0		10.4	9.7
Approach LOS					B	A

Intersection Summary					
Average Delay		3.6			
Intersection Capacity Utilization		27.8%	ICU Level of Service		A
Analysis Period (min)		15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	40	80	250	15	205	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	44	89	278	17	228	906
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	89	278	17	228	906
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	40	80	250	15	205	815
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	89	278	17	228	906
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1196	149			299	
vC1, stage 1 conf vol	283					
vC2, stage 2 conf vol	913					
vCu, unblocked vol	1196	149			299	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	90			82	
cM capacity (veh/h)	267	854			1232	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	44	89	139	139	17	228	453	453
Volume Left	44	0	0	0	0	228	0	0
Volume Right	0	89	0	0	17	0	0	0
cSH	267	854	1700	1700	1700	1232	1700	1700
Volume to Capacity	0.17	0.10	0.08	0.08	0.01	0.18	0.27	0.27
Queue Length 95th (ft)	15	9	0	0	0	17	0	0
Control Delay (s)	21.2	9.7	0.0	0.0	0.0	8.6	0.0	0.0
Lane LOS	C	A				A		
Approach Delay (s)	13.5		0.0			1.7		
Approach LOS	B							

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	155	5	20	160	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.884	
Flt Protected				0.995	0.993	
Satd. Flow (prot)	1800	0	0	1800	1588	0
Flt Permitted				0.995	0.993	
Satd. Flow (perm)	1800	0	0	1800	1588	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	172	6	22	178	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	178	0	0	200	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	155	5	20	160	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	172	6	22	178	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			178		397	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		397	175
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1380		593	861

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	178	200	7
Volume Left	0	22	1
Volume Right	6	0	6
cSH	1700	1380	800
Volume to Capacity	0.10	0.02	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	1.0	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	1.0	9.5
Approach LOS			A

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		31.3%	ICU Level of Service	A
Analysis Period (min)		15		

AWSC Queues - 2025 Background Traffic, With Improvements

Calculations from Equation 17-37 of HCM2000 (pg. 17-23); Assumes 25-foot vehicle length

T = 0.25

Lacy Road & Research Park Drive

AM	EBLT	EBR	WBL	WBTR	NBLTR	SBLTR
v,x	350	217	94	233	217	39
cm,x	574	670	512	563	539	479
vx/cmx	0.61	0.32	0.18	0.41	0.40	0.08
vx/cx - 1	-0.39	-0.68	-0.82	-0.59	-0.60	-0.92
95th %-ile Queue (veh):	4	1	1	2	2	0
95th %-ile Queue (feet):	102	35	17	50	48	7

PM	EBLT	EBR	WBL	WBTR	NBLTR	SBLTR
v,x	317	167	28	306	344	189
cm,x	465	514	418	450	488	437
vx/cmx	0.68	0.32	0.07	0.68	0.70	0.43
vx/cx - 1	-0.32	-0.68	-0.93	-0.32	-0.30	-0.57
95th %-ile Queue (veh):	5	1	0	5	5	2
95th %-ile Queue (feet):	126	35	5	125	137	53

```
*****************************************************************************
*                                                                           *
*   9:1:09              2025 BACK - CHERYL/RESEARCH PARK                  25  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   15  640  125  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10   15   10  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   25  290    5  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*   25    5   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     780     35    320     45           * AVEDEL  s   2.9 *
* CAPACITY    veh    2084    613   1592    865           * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.10   0.05   0.07           * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.14   0.06   0.09           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   0.9 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    14 *
*                                                        *                  *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09              2025 BACK - CHERYL/RESEARCH PARK                  26  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   10  390   90  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10    5   40  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  805   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*  175   20   55  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     490     55    835    250           * AVEDEL  s   5.0 *
* CAPACITY    veh    2035    743   1602    571           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.09   0.08   0.19           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.11   0.11   0.29           *                  *
* AVE QUEUE   veh       0      0      1      1           * VEHIC HRS   2.3 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    34 *
*                                                        *                  *
*****************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2025 BACK - CHERYL/RESEARCH PARK                27  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   15  640  125  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10   15   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   25  290    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*   25    5   15  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*************************************************************************
*                                                        *                  *
* FLOW        veh     780     35    320     45           * AVEDEL  s   2.5 *
* CAPACITY    veh    2281    810   1789   1062           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.08   0.04   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.10   0.05   0.07           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   0.8 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    12 *
*                                                        *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09              2025 BACK - CHERYL/RESEARCH PARK                28  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   10  390   90  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10    5   40  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  805   15  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*  175   20   55  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*************************************************************************
*                                                        *                  *
* FLOW        veh     490     55    835    250           * AVEDEL  s   3.7 *
* CAPACITY    veh    2232    940   1799    768           * LOS   SIG     A *
* AVE DELAY  mins    0.03   0.07   0.06   0.12           * LOS UNSIG     A *
* MAX DELAY  mins    0.04   0.09   0.08   0.16           *                  *
* AVE QUEUE   veh       0      0      1      0           * VEHIC HRS   1.7 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    25 *
*                                                        *                  *
*************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BACK - LACY/FAHEY GLEN                    13  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*   15  255    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   35   15    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  325   30    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     270     50    355              * AVEDEL  s   5.0 *
* CAPACITY    veh    1010    884   1018              * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.07   0.09              * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.09   0.12              *                      *
* AVE QUEUE   veh       0      0      1              * VEHIC HRS   0.9 *
* MAX QUEUE   veh       0      0      1              * COST    $    14 *
*                                                    *                      *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BACK - LACY/FAHEY GLEN                    14  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*   15  360    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   15   15    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  305   30    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     375     30    335              * AVEDEL  s   5.3 *
* CAPACITY    veh    1010    825   1018              * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.07   0.09              * LOS UNSIG     A *
* MAX DELAY  mins    0.12   0.09   0.11              *                      *
* AVE QUEUE   veh       1      0      0              * VEHIC HRS   1.1 *
* MAX QUEUE   veh       1      0      1              * COST    $    16 *
*                                                    *                      *
*****************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09               2025 BACK - LACY/FAHEY GLEN                      15  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*   15  255    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   35   15    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  325   30    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     270     50    355              * AVEDEL  s   3.9 *
* CAPACITY    veh    1207   1081   1215              * LOS   SIG     A *
* AVE DELAY  mins    0.06   0.06   0.07              * LOS UNSIG     A *
* MAX DELAY  mins    0.08   0.07   0.09              *                        *
* AVE QUEUE   veh       0      0      0              * VEHIC HRS   0.7 *
* MAX QUEUE   veh       0      0      0              * COST    $    11 *
*                                                    *                        *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09               2025 BACK - LACY/FAHEY GLEN                      16  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*   15  360    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   15   15    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  305   30    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     375     30    335              * AVEDEL  s   4.1 *
* CAPACITY    veh    1207   1023   1215              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.06   0.07              * LOS UNSIG     A *
* MAX DELAY  mins    0.09   0.08   0.09              *                        *
* AVE QUEUE   veh       0      0      0              * VEHIC HRS   0.8 *
* MAX QUEUE   veh       1      0      0              * COST    $    13 *
*                                                    *                        *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09                2025 BACK - CHERYL/SYENE                      22  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB CHERYL*1.05*    5  105   45  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  295  295   30  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  170  510   70  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  265   65   30  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                          *                  *
* FLOW        veh     155    620    750    360            * AVEDEL  s   7.4 *
* CAPACITY    veh    1582    931   1826    703            * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.20   0.06   0.18            * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.30   0.08   0.26            *                  *
* AVE QUEUE   veh       0      2      1      1            * VEHIC HRS   3.9 *
* MAX QUEUE   veh       0      3      1      1            * COST    $    58 *
*                                                          *                  *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09                2025 BACK - CHERYL/SYENE                      23  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB CHERYL*1.05*   25  520  220  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   80   75   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   45  170  345  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   90  335  165  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                          *                  *
* FLOW        veh     765    165    560    590            * AVEDEL  s  13.1 *
* CAPACITY    veh    1130    547   1875    748            * LOS   SIG     B *
* AVE DELAY  mins    0.18   0.16   0.04   0.45            * LOS UNSIG     B *
* MAX DELAY  mins    0.30   0.23   0.06   0.81            *                  *
* AVE QUEUE   veh       2      0      0      5            * VEHIC HRS   7.6 *
* MAX QUEUE   veh       3      1      0      7            * COST    $   114 *
*                                                          *                  *
*****************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                  2025 BACK - CHERYL/SYENE                      24  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*    5  105   45  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  295  295   30  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  170  510   70  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  265   65   30  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     155    620    750    360          * AVEDEL  s   4.9 *
* CAPACITY    veh    1779   1128   2023    901          * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.12   0.05   0.11          * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.17   0.06   0.15          *                  *
* AVE QUEUE   veh       0      1      1      1          * VEHIC HRS   2.5 *
* MAX QUEUE   veh       0      2      1      1          * COST    $    38 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                  2025 BACK - CHERYL/SYENE                      25  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   25  520  220  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   80   75   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   45  170  345  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   90  335  165  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     765    165    560    590          * AVEDEL  s   6.5 *
* CAPACITY    veh    1327    744   2072    946          * LOS   SIG     A *
* AVE DELAY  mins    0.11   0.10   0.04   0.17          * LOS UNSIG     A *
* MAX DELAY  mins    0.17   0.14   0.05   0.27          *                  *
* AVE QUEUE   veh       1      0      0      2          * VEHIC HRS   3.8 *
* MAX QUEUE   veh       2      0      0      2          * COST    $    57 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09               2025 BACK - CHERYL/NEW LACY                      19  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   40  390    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  535   30    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  720  545    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     430    565   1265              * AVEDEL  s   9.8 *
* CAPACITY    veh    1696    820   1653              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.25   0.17              * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.39   0.27              *                        *
* AVE QUEUE   veh       0      2      4              * VEHIC HRS   6.2 *
* MAX QUEUE   veh       0      3      5              * COST    $    92 *
*                                                    *                        *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09               2025 BACK - CHERYL/NEW LACY                      20  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   25  740    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  400   25    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  535  340    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     765    425    875              * AVEDEL  s   7.1 *
* CAPACITY    veh    1849    634   1657              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.32   0.08              * LOS UNSIG     A *
* MAX DELAY  mins    0.07   0.53   0.11              *                        *
* AVE QUEUE   veh       1      2      1              * VEHIC HRS   4.1 *
* MAX QUEUE   veh       1      3      1              * COST    $    61 *
*                                                    *                        *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BACK - CHERYL/NEW LACY                    21  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   40  390    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  535   30    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  720  545    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     430    565   1265              * AVEDEL  s   6.0 *
* CAPACITY    veh    1893   1017   1851              * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.13   0.11              * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.19   0.16              *                      *
* AVE QUEUE   veh       0      1      2              * VEHIC HRS   3.8 *
* MAX QUEUE   veh       0      2      3              * COST    $    56 *
*                                                    *                      *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BACK - CHERYL/NEW LACY                    22  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   25  740    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  400   25    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  535  340    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     765    425    875              * AVEDEL  s   4.4 *
* CAPACITY    veh    2046    832   1854              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.15   0.06              * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.22   0.08              *                      *
* AVE QUEUE   veh       1      1      1              * VEHIC HRS   2.5 *
* MAX QUEUE   veh       1      1      1              * COST    $    38 *
*                                                    *                      *
*****************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2025 BACK - IRISH/SYENE                        14  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*   35   45   90  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  700  105  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   20   60    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   30  215   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     170    806     85    255           * AVEDEL  s  20.7 *
* CAPACITY    veh     898    946    527    932           * LOS   SIG     C *
* AVE DELAY  mins    0.08   0.50   0.13   0.09           * LOS UNSIG     C *
* MAX DELAY  mins    0.10   0.94   0.19   0.11           *                  *
* AVE QUEUE   veh       0      7      0      0           * VEHIC HRS   7.6 *
* MAX QUEUE   veh       0     12      0      0           * COST    $   114 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2025 BACK - IRISH/SYENE                        15  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*  100   50   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1   85   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*    5   45    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   85  575   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     160    136     55    685           * AVEDEL  s  10.3 *
* CAPACITY    veh     689    979    946    971           * LOS   SIG     B *
* AVE DELAY  mins    0.11   0.07   0.07   0.22           * LOS UNSIG     B *
* MAX DELAY  mins    0.15   0.09   0.08   0.33           *                  *
* AVE QUEUE   veh       0      0      0      3           * VEHIC HRS   3.0 *
* MAX QUEUE   veh       0      0      0      3           * COST    $    45 *
*                                                        *                    *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BACK - IRISH/SYENE                   16  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*   35   45   90  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  700  105  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   20   60    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   30  215   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     170    806     85    255       * AVEDEL  s   8.4 *
* CAPACITY    veh    1095   1143    724   1129       * LOS   SIG     A *
* AVE DELAY  mins    0.06   0.18   0.09   0.07       * LOS UNSIG     A *
* MAX DELAY  mins    0.08   0.28   0.13   0.09       *                  *
* AVE QUEUE   veh       0      3      0      0       * VEHIC HRS   3.1 *
* MAX QUEUE   veh       0      3      0      0       * COST    $    46 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09                2025 BACK - IRISH/SYENE                   17  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*  100   50   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1   85   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*    5   45    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   85  575   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     160    136     55    685       * AVEDEL  s   6.3 *
* CAPACITY    veh     886   1176   1143   1168       * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.06   0.05   0.12       * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.07   0.07   0.18       *                  *
* AVE QUEUE   veh       0      0      0      1       * VEHIC HRS   1.8 *
* MAX QUEUE   veh       0      0      0      2       * COST    $    27 *
*                                                    *                  *
*************************************************************************
```

APPENDIX D

Year 2035 Background Traffic Peak Hour Analysis Outputs *With Improvements*

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	355	15	1120	325	675	420	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	0.99		0.98	1.00		0.97
Frt		0.919				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1646	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.754			0.717			0.950			0.950		
Satd. Flow (perm)	1355	1646	0	1289	1810	1514	1700	3438	1514	3328	3438	1500
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	28	33	100	6	197	17	1244	181	750	467	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	61	0	100	6	197	17	1244	181	750	467	17
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	15.0	40.0	40.0	25.0	50.0	50.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	27.8%	27.8%	16.7%	44.4%	44.4%	27.8%	55.6%	55.6%
Maximum Green (s)	19.0	19.0		19.0	19.0	20.5	10.5	34.0	34.0	20.5	44.0	44.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

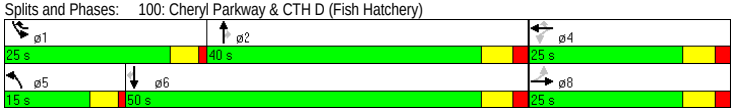
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.74	0.22		0.47	0.02	0.29	0.11	0.92	0.30	0.88	0.21	0.02
Control Delay	54.4	32.9		40.1	29.0	14.7	36.1	30.0	18.3	46.8	8.5	9.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	32.9		40.1	29.0	14.7	36.1	30.0	18.3	46.8	8.5	9.4
90th %ile Green (s)	19.0	19.0		19.0	19.0	20.5	8.0	34.0	34.0	20.5	46.5	46.5
90th %ile Term Code	Max	Max		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	18.1	18.1		18.1	18.1	21.4	8.0	34.0	34.0	21.4	47.4	47.4
70th %ile Term Code	Gap	Gap		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	15.4	15.4		15.4	15.4	24.1	0.0	34.0	34.0	24.1	62.6	62.6
50th %ile Term Code	Gap	Gap		Hold	Hold	Max	Skip	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	12.6	12.6		12.6	12.6	25.4	0.0	35.5	35.5	25.4	65.4	65.4
30th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	10.0	10.0		10.0	10.0	23.2	0.0	40.3	40.3	23.2	68.0	68.0
10th %ile Term Code	Min	Min		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	91	30		52	3	60	9	179	50	207	42	3
Queue Length 95th (ft)	153	63		97	13	103	m13	m#472	m91	#340	104	15
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	286	347		272	382	669	201	1358	598	849	2215	966
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.18		0.37	0.02	0.29	0.08	0.92	0.30	0.88	0.21	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	355	15	1120	325	675	420	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1704	1644		1705	1810	1529	1719	3438	1514	3335	3438	1501
Flt Permitted	0.75	1.00		0.72	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1352	1644		1287	1810	1529	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	167	28	33	100	6	197	17	1244	181	750	467	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	167	61	0	100	6	197	17	1244	181	750	467	17
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	15.0	15.0		15.0	15.0	37.9	3.2	35.6	35.6	22.9	55.3	55.3
Effective Green, g (s)	15.0	15.0		15.0	15.0	37.9	3.2	35.6	35.6	22.9	55.3	55.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.42	0.04	0.40	0.40	0.25	0.61	0.61
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	225	274		215	302	644	61	1360	599	849	2112	922
v/s Ratio Prot		0.04			0.00	0.08	0.01	c0.36		c0.22	0.14	
v/s Ratio Perm	c0.12			0.08		0.05			0.12			0.01
v/c Ratio	0.74	0.22		0.47	0.02	0.31	0.28	0.91	0.30	0.88	0.22	0.02
Uniform Delay, d1	35.7	32.5		33.9	31.4	17.3	42.3	25.8	18.7	32.3	7.7	6.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.92	0.78	0.88	1.00	1.00	1.00
Incremental Delay, d2	10.9	0.2		0.6	0.0	0.1	0.6	7.9	0.9	10.5	0.2	0.0
Delay (s)	46.6	32.6		34.5	31.4	17.4	39.5	28.1	17.2	42.8	8.0	6.8
Level of Service	D	C		C	C	B	D	C	B	D	A	A
Approach Delay (s)		42.9			23.3			26.8			29.1	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	920	190	175	580	0	0	0	0	470	1	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.155						0.950	0.953	
Satd. Flow (perm)	0	4451	1538	280	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1022	106	194	644	0	0	0	0	522	1	806
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1022	106	194	644	0	0	0	0	261	262	806
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	38.0	38.0	12.0	50.0	0.0	0.0	0.0	0.0	30.0	30.0	30.0
Total Split (%)	0.0%	47.5%	47.5%	15.0%	62.5%	0.0%	0.0%	0.0%	0.0%	37.5%	37.5%	37.5%
Maximum Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

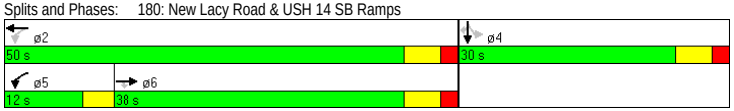
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.59	0.18	0.65	0.35					0.50	0.50	0.94
Control Delay		20.9	16.7	15.9	3.2					26.8	26.8	47.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		20.9	16.7	15.9	3.2					26.8	26.8	47.4
90th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
70th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
50th %ile Green (s)		32.0	32.0	8.5	44.0					24.0	24.0	24.0
50th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
30th %ile Green (s)		29.8	29.8	7.8	41.1					26.9	26.9	26.9
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		29.9	29.9	6.2	39.6					28.4	28.4	28.4
10th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		157	33	43	36					113	113	226
Queue Length 95th (ft)		203	66	0	0					190	191	#360
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		1780	615	311	1891					520	521	861
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.57	0.17	0.62	0.34					0.50	0.50	0.94

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 77 (96%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	920	190	175	580	0	0	0	0	470	1	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438					1633	1637	2707
Flt Permitted		1.00	1.00	0.15	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4451	1538	280	3438					1633	1637	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1022	106	194	644	0	0	0	0	522	1	806
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1022	106	194	644	0	0	0	0	261	262	806
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		31.1	31.1	42.5	42.5					25.5	25.5	25.5
Effective Green, g (s)		31.1	31.1	42.5	42.5					25.5	25.5	25.5
Actuated g/C Ratio		0.39	0.39	0.53	0.53					0.32	0.32	0.32
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		1730	598	291	1826					521	522	863
v/s Ratio Prot		0.23		c0.07	0.19							
v/s Ratio Perm			0.07	c0.29						0.16	0.16	c0.30
v/c Ratio		0.59	0.18	0.67	0.35					0.50	0.50	0.93
Uniform Delay, d1		19.4	16.1	11.6	10.8					22.1	22.1	26.4
Progression Factor		1.00	1.00	0.73	0.26					1.00	1.00	1.00
Incremental Delay, d2		1.5	0.6	3.8	0.4					0.3	0.3	16.6
Delay (s)		20.9	16.7	12.3	3.2					22.4	22.4	43.0
Level of Service		C	B	B	A					C	C	D
Approach Delay (s)		20.5			5.3			0.0			34.9	
Approach LOS		C			A			A			C	

Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		9.5	
Intersection Capacity Utilization	61.9%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

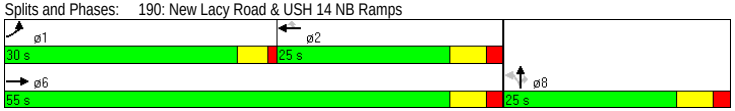
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	710	680	0	0	505	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	789	756	0	0	561	244	278	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	789	756	0	0	561	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.84	0.34			0.53	0.51		0.80	0.28			
Control Delay	17.5	2.0			26.5	29.7		47.8	28.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	17.5	2.0			26.5	29.7		47.8	28.2			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.3	49.0			19.2	19.2	19.0	19.0	19.0			
70th %ile Term Code	Gap	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	23.2	50.7			23.0	23.0	17.3	17.3	17.3			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	20.9	53.3			27.9	27.9	14.7	14.7	14.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	17.6	57.2			35.1	35.1	10.8	10.8	10.8			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	188	25			124	103		131	36			
Queue Length 95th (ft)	259	36			190	#195		#215	73			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1063	2228			1067	477		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.74	0.34			0.53	0.51		0.68	0.24			

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	710	680	0	0	505	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	789	756	0	0	561	244	278	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	789	756	0	0	561	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	22.5	51.8			24.8	24.8		16.2	16.2			
Effective Green, g (s)	22.5	51.8			24.8	24.8		16.2	16.2			
Actuated g/C Ratio	0.28	0.65			0.31	0.31		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	938	2226			1066	477		349	311			
v/s Ratio Prot	c0.24	0.22			c0.16							
v/s Ratio Perm						0.16		0.16	0.06			
v/c Ratio	0.84	0.34			0.53	0.51		0.80	0.28			
Uniform Delay, d1	27.1	6.4			22.8	22.6		30.4	26.9			
Progression Factor	0.37	0.24			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.6	0.4			1.9	3.9		11.3	0.2			
Delay (s)	15.6	1.9			24.6	26.5		41.7	27.1			
Level of Service	B	A			C	C		D	C			
Approach Delay (s)		8.9			25.2			38.2			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	355	75	45	185	200	75	830	125	105	265	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	155		200	150		175	150		200
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00		0.98	1.00		0.97	1.00		0.97
Frt		0.974				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1758	0	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.360			0.490			0.572			0.179		
Satd. Flow (perm)	650	1758	0	883	1810	1507	1031	3438	1497	323	3438	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	411	394	83	50	206	111	83	922	69	117	294	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	477	0	50	206	111	83	922	69	117	294	58
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	18.0	40.0	0.0	22.0	22.0	22.0	12.0	38.0	38.0	12.0	38.0	38.0
Total Split (%)	20.0%	44.4%	0.0%	24.4%	24.4%	24.4%	13.3%	42.2%	42.2%	13.3%	42.2%	42.2%
Maximum Green (s)	14.5	34.0		16.0	16.0	16.0	8.5	32.0	32.0	8.5	32.0	32.0
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

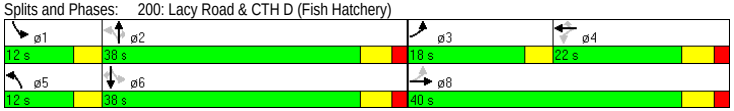
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.91	0.73		0.37	0.75	0.48	0.15	0.68	0.12	0.42	0.21	0.10
Control Delay	49.5	32.0		41.7	53.0	41.7	11.9	26.8	20.2	21.5	15.4	15.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	32.0		41.7	53.0	41.7	11.9	26.8	20.2	21.5	15.4	15.6
90th %ile Green (s)	14.5	34.0		16.0	16.0	16.0	8.5	32.0	32.0	8.5	32.0	32.0
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	14.5	34.0		16.0	16.0	16.0	7.5	32.0	32.0	8.5	33.0	33.0
70th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	15.7	33.7		14.5	14.5	14.5	6.6	33.2	33.2	7.6	34.2	34.2
50th %ile Term Code	Max	Hold		Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	19.6	35.3		12.2	12.2	12.2	6.0	32.5	32.5	6.7	33.2	33.2
30th %ile Term Code	Max	Hold		Gap	Gap	Gap	Min	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	16.7	30.2		10.0	10.0	10.0	0.0	47.8	47.8	0.0	47.8	47.8
10th %ile Term Code	Gap	Hold		Min	Min	Min	Skip	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	179	229		26	112	58	23	234	26	22	51	19
Queue Length 95th (ft)	#309	344		61	183	108	46	313	56	86	73	40
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300			155		200	150		175	150		200
Base Capacity (vph)	452	669		157	322	268	578	1356	590	294	1377	599
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.71		0.32	0.64	0.41	0.14	0.68	0.12	0.40	0.21	0.10

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	355	75	45	185	200	75	830	125	105	265	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1757		1710	1810	1505	1716	3438	1498	1719	3438	1498
Flt Permitted	0.36	1.00		0.49	1.00	1.00	0.57	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	650	1757		883	1810	1505	1033	3438	1498	323	3438	1498
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	411	394	83	50	206	111	83	922	69	117	294	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	411	477	0	50	206	111	83	922	69	117	294	58
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	33.4	33.4		13.7	13.7	13.7	40.5	34.8	34.8	41.7	35.4	35.4
Effective Green, g (s)	33.4	33.4		13.7	13.7	13.7	40.5	34.8	34.8	41.7	35.4	35.4
Actuated g/C Ratio	0.37	0.37		0.15	0.15	0.15	0.45	0.39	0.39	0.46	0.39	0.39
Clearance Time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	433	652		134	276	229	508	1329	579	247	1352	589
v/s Ratio Prot	c0.17	0.27			0.11		0.01	c0.27		c0.03	0.09	
v/s Ratio Perm	c0.18			0.06		0.07	0.06		0.05	0.19		0.04
v/c Ratio	0.95	0.73		0.37	0.75	0.48	0.16	0.69	0.12	0.47	0.22	0.10
Uniform Delay, d1	24.6	24.4		34.3	36.5	34.9	14.3	23.1	17.7	15.5	18.1	17.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.46	0.79	0.79
Incremental Delay, d2	30.0	3.7		0.6	9.2	0.6	0.1	3.0	0.4	0.5	0.4	0.3
Delay (s)	54.5	28.1		34.9	45.7	35.5	14.4	26.1	18.2	23.1	14.6	14.0
Level of Service	D	C		C	D	D	B	C	B	C	B	B
Approach Delay (s)		40.3			41.2			24.7			16.7	
Approach LOS		D			D			C			B	

Intersection Summary

HCM Average Control Delay	30.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	215	5	1	345	10	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.873	
Flt Protected			0.950		0.997	
Satd. Flow (prot)	1810	1538	1719	1810	1575	0
Flt Permitted			0.950		0.997	
Satd. Flow (perm)	1810	1538	1719	1810	1575	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	239	6	1	383	11	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	239	6	1	383	189	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	215	5	1	345	10	160
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	239	6	1	383	11	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			244		624	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			244		624	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	78
cM capacity (veh/h)			1304		444	793

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	239	6	1	383	189
Volume Left	0	0	1	0	11
Volume Right	0	6	0	0	178
cSH	1700	1700	1304	1700	758
Volume to Capacity	0.14	0.00	0.00	0.23	0.25
Queue Length 95th (ft)	0	0	0	0	25
Control Delay (s)	0.0	0.0	7.8	0.0	11.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		11.3
Approach LOS					B

Intersection Summary				
Average Delay		2.6		
Intersection Capacity Utilization		35.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	15	320	460	30	25	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.927	
Flt Protected		0.998			0.978	
Satd. Flow (prot)	0	1806	1810	1538	1641	0
Flt Permitted		0.998			0.978	
Satd. Flow (perm)	0	1806	1810	1538	1641	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	17	356	511	33	28	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	373	511	33	61	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	320	460	30	25	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	356	511	33	28	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			991			
pX, platoon unblocked	0.84				0.84	0.84
vC, conflicting volume	544				900	511
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	362				785	322
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	94
cM capacity (veh/h)	991				295	598

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	372	511	33	61
Volume Left	17	0	0	28
Volume Right	0	0	33	33
cSH	991	1700	1700	407
Volume to Capacity	0.02	0.30	0.02	0.15
Queue Length 95th (ft)	1	0	0	13
Control Delay (s)	0.6	0.0	0.0	15.4
Lane LOS	A			C
Approach Delay (s)	0.6	0.0		15.4
Approach LOS				C

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	155	1	210	370	50	30	450	410	10	70	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99		0.97	1.00		0.97
Frt		0.999			0.982				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1807	0	1719	1771	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.275			0.642			0.706			0.233		
Satd. Flow (perm)	496	1807	0	1156	1771	0	1270	1810	1497	420	1810	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	211	172	1	233	411	56	33	500	228	11	78	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	173	0	233	467	0	33	500	228	11	78	50
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	1	6		5	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.0		9.5	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	12.0	30.0	0.0	12.0	30.0	0.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	16.0%	40.0%	0.0%	16.0%	40.0%	0.0%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	8.5	24.0		8.5	24.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

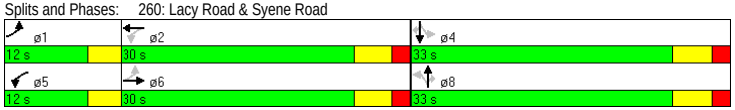
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		None	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.56	0.30		0.38	0.81		0.08	0.84	0.46	0.08	0.13	0.10
Control Delay	16.0	20.2		11.8	35.6		16.6	36.1	22.0	17.7	17.0	16.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	20.2		11.8	35.6		16.6	36.1	22.0	17.7	17.0	16.8
90th %ile Green (s)	8.5	24.0		8.5	24.0		27.0	27.0	27.0	27.0	27.0	27.0
90th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	8.5	24.0		8.5	24.0		27.0	27.0	27.0	27.0	27.0	27.0
70th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Hold	Hold	Hold
50th %ile Green (s)	8.5	24.0		8.5	24.0		25.4	25.4	25.4	25.4	25.4	25.4
50th %ile Term Code	Max	Hold		Max	Max		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	7.5	22.2		8.1	22.8		20.2	20.2	20.2	20.2	20.2	20.2
30th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	15.8		6.1	15.9		13.6	13.6	13.6	13.6	13.6	13.6
10th %ile Term Code	Min	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	48	58		54	191		10	202	78	3	24	15
Queue Length 95th (ft)	90	108		99	#354		28	#350	138	14	52	37
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	398	651		638	638		515	734	607	170	734	607
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.27		0.37	0.73		0.06	0.68	0.38	0.06	0.11	0.08

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 68.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 75
50th %ile Actuated Cycle: 73.4
30th %ile Actuated Cycle: 66
10th %ile Actuated Cycle: 51
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 260: Lacy Road & Syene Road



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HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	155	1	210	370	50	30	450	410	10	70	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		3.5	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1808		1714	1771		1707	1810	1496	1714	1810	1496
Flt Permitted	0.28	1.00		0.64	1.00		0.71	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	497	1808		1159	1771		1269	1810	1496	420	1810	1496
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	211	172	1	233	411	56	33	500	228	11	78	50
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	211	173	0	233	467	0	33	500	228	11	78	50
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	29.8	22.0		30.2	22.2		22.3	22.3	22.3	22.3	22.3	22.3
Effective Green, g (s)	29.8	22.0		30.2	22.2		22.3	22.3	22.3	22.3	22.3	22.3
Actuated g/C Ratio	0.44	0.32		0.45	0.33		0.33	0.33	0.33	0.33	0.33	0.33
Clearance Time (s)	3.5	6.0		3.5	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	359	587		582	580		417	595	492	138	595	492
v/s Ratio Prot	c0.07	0.10		0.05	c0.26			c0.28			0.04	
v/s Ratio Perm	0.19			0.13			0.03		0.15	0.03		0.03
v/c Ratio	0.59	0.29		0.40	0.81		0.08	0.84	0.46	0.08	0.13	0.10
Uniform Delay, d1	13.1	17.1		12.1	20.8		15.7	21.1	18.0	15.7	16.0	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.6		0.2	9.1		0.0	10.0	0.3	0.1	0.0	0.0
Delay (s)	14.6	17.7		12.2	29.9		15.7	31.1	18.3	15.8	16.0	15.8
Level of Service	B	B		B	C		B	C	B	B	B	B
Approach Delay (s)		16.0			24.0			26.6			15.9	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	9.5
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
270: Lacy Road & New Lacy Road

1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	255	320	360	30	25	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1791	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1791	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	283	356	400	33	28	300
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	356	433	0	28	300
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	255	320	360	30	25	270
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	283	356	400	33	28	300
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		2	2			
Upstream signal (ft)		753				
pX, platoon unblocked						
vC, conflicting volume	438				1349	427
vC1, stage 1 conf vol					422	
vC2, stage 2 conf vol					927	
vCu, unblocked vol	438				1349	427
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	74				89	51
cM capacity (veh/h)	1101				264	616

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	283	356	433	28	300
Volume Left	283	0	0	28	0
Volume Right	0	0	33	0	300
cSH	1101	1700	1700	264	616
Volume to Capacity	0.26	0.21	0.25	0.11	0.49
Queue Length 95th (ft)	26	0	0	9	67
Control Delay (s)	9.4	0.0	0.0	20.2	16.3
Lane LOS	A			C	C
Approach Delay (s)	4.2		0.0	16.6	
Approach LOS				C	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		49.8%	ICU Level of Service A
Analysis Period (min)		15	

Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	15	10	30	10	1140	70	145	265	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.960			0.971		0.950			0.950		
Satd. Flow (prot)	0	1737	1538	0	1757	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.960			0.971		0.950			0.950		
Satd. Flow (perm)	0	1737	1538	0	1757	1538	1719	3438	1538	1719	3438	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	17	17	11	33	11	1267	78	161	294	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	17	0	28	33	11	1267	78	161	294	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	10	15	15	10	30	10	1140	70	145	265	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	11	17	17	11	33	11	1267	78	161	294	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1321	1993	157	1791	1938	643	322			1349		
vC1, stage 1 conf vol	622	622		1294	1294							
vC2, stage 2 conf vol	699	1372		497	644							
vCu, unblocked vol	1321	1993	157	1791	1938	643	322			1349		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	73	98	88	94	92	99			67		
cM capacity (veh/h)	157	42	844	143	177	405	1209			489		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	67	17	28	33	11	633	633	78	161	147	147	22
Volume Left	56	0	17	0	11	0	0	0	161	0	0	0
Volume Right	0	17	0	33	0	0	0	78	0	0	0	22
cSH	107	844	155	405	1209	1700	1700	1700	489	1700	1700	1700
Volume to Capacity	0.62	0.02	0.18	0.08	0.01	0.37	0.37	0.05	0.33	0.09	0.09	0.01
Queue Length 95th (ft)	77	2	16	7	1	0	0	0	36	0	0	0
Control Delay (s)	82.3	9.4	33.2	14.7	8.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0
Lane LOS	F	A	D	B	A				C			
Approach Delay (s)	67.7		23.1		0.1				5.4			
Approach LOS	F		C									

Intersection Summary					
Average Delay	4.9				
Intersection Capacity Utilization	60.0%	ICU Level of Service		B	
Analysis Period (min)	15				

Volume
310: Nobel Drive & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	95	45	15	15	1	15	1	30	15	15	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.952			0.992			0.913			0.955	
Flt Protected	0.950			0.950				0.984			0.984	
Satd. Flow (prot)	1719	1723	0	1719	1795	0	0	1626	0	0	1700	0
Flt Permitted	0.950			0.950				0.984			0.984	
Satd. Flow (perm)	1719	1723	0	1719	1795	0	0	1626	0	0	1700	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	67	106	50	17	17	1	17	1	33	17	17	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	156	0	17	18	0	0	51	0	0	51	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	95	45	15	15	1	15	1	30	15	15	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	67	106	50	17	17	1	17	1	33	17	17	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	23			161			349	325	141	333	349	27
vC1, stage 1 conf vol							269	269		56	56	
vC2, stage 2 conf vol							80	56		278	294	
vCu, unblocked vol	23			161			349	325	141	333	349	27
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			97	100	96	97	97	98
cM capacity (veh/h)	1567			1395			654	622	892	626	597	1031

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	67	156	17	18	51	50
Volume Left	67	0	17	0	17	17
Volume Right	0	50	0	1	33	17
cSH	1567	1700	1395	1700	791	707
Volume to Capacity	0.04	0.09	0.01	0.01	0.06	0.07
Queue Length 95th (ft)	3	0	1	0	5	6
Control Delay (s)	7.4	0.0	7.6	0.0	9.9	10.5
Lane LOS	A		A		A	B
Approach Delay (s)	2.2		3.7		9.9	10.5
Approach LOS					A	B

Intersection Summary					
Average Delay	4.6				
Intersection Capacity Utilization	24.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	215	780	70	60	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	33	239	867	78	67	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	239	867	78	67	189
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery)

1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	215	780	70	60	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	239	867	78	67	189
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1104	443			949	
vC1, stage 1 conf vol	872					
vC2, stage 2 conf vol	233					
vCu, unblocked vol	1104	443			949	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	57			90	
cM capacity (veh/h)	338	549			698	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	239	433	433	78	67	94	94
Volume Left	33	0	0	0	0	67	0	0
Volume Right	0	239	0	0	78	0	0	0
cSH	338	549	1700	1700	1700	698	1700	1700
Volume to Capacity	0.10	0.43	0.25	0.25	0.05	0.10	0.06	0.06
Queue Length 95th (ft)	8	55	0	0	0	8	0	0
Control Delay (s)	16.8	16.5	0.0	0.0	0.0	10.7	0.0	0.0
Lane LOS	C	C				B		
Approach Delay (s)	16.5		0.0			2.8		
Approach LOS	C							

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill

1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	170	1	1	200	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.918	
Flt Protected					0.981	
Satd. Flow (prot)	1808	0	0	1810	1630	0
Flt Permitted					0.981	
Satd. Flow (perm)	1808	0	0	1810	1630	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	189	1	1	222	11	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	0	223	28	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill

1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	170	1	1	200	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	189	1	1	222	11	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			190		414	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		414	189
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	98
cM capacity (veh/h)			1366		589	845

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	223	28
Volume Left	0	1	11
Volume Right	1	0	17
cSH	1700	1366	719
Volume to Capacity	0.11	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.2
Approach LOS			B

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	21.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	860	10	545	20	430	1175	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	1.00		0.98	0.99		0.97
Frt		0.900				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1610	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.736			0.736			0.950			0.950		
Satd. Flow (perm)	1325	1610	0	1325	1810	1515	1712	3438	1513	3316	3438	1499
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	22	239	33	478	11	606	11	478	1306	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	33	0	239	33	478	11	606	11	478	1306	61
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	22.0	13.0	38.0	38.0	22.0	47.0	47.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	24.4%	14.4%	42.2%	42.2%	24.4%	52.2%	52.2%
Maximum Green (s)	24.0	24.0		24.0	24.0	17.5	8.5	32.0	32.0	17.5	41.0	41.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

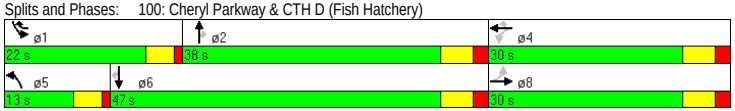
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.19	0.09		0.83	0.08	0.76	0.07	0.42	0.02	0.80	0.61	0.07
Control Delay	28.5	26.5		56.1	26.3	26.9	29.0	20.3	17.9	46.0	14.0	9.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	26.5		56.1	26.3	26.9	29.0	20.3	17.9	46.0	14.0	9.8
90th %ile Green (s)	24.0	24.0		24.0	24.0	17.5	8.0	32.0	32.0	17.5	41.5	41.5
90th %ile Term Code	Hold	Hold		Max	Max	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	23.9	23.9		23.9	23.9	18.6	0.0	31.0	31.0	18.6	54.1	54.1
70th %ile Term Code	Hold	Hold		Gap	Gap	Max	Skip	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	20.7	20.7		20.7	20.7	17.1	0.0	35.7	35.7	17.1	57.3	57.3
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	17.3	17.3		17.3	17.3	15.2	0.0	41.0	41.0	15.2	60.7	60.7
30th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	12.3	12.3		12.3	12.3	12.4	0.0	48.8	48.8	12.4	65.7	65.7
10th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	26	15		128	15	194	4	136	4	133	205	12
Queue Length 95th (ft)	56	37		#212	37	275	m12	226	m11	186	421	41
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	353	429		353	483	659	162	1448	637	656	2134	930
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.08		0.68	0.07	0.73	0.07	0.42	0.02	0.73	0.61	0.07

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	860	10	545	20	430	1175	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	1608		1708	1810	1525	1719	3438	1514	3335	3438	1501
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1322	1608		1322	1810	1525	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	56	11	22	239	33	478	11	606	11	478	1306	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	56	33	0	239	33	478	11	606	11	478	1306	61
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	19.6	19.6		19.6	19.6	35.8	1.6	37.7	37.7	16.2	52.3	52.3
Effective Green, g (s)	19.6	19.6		19.6	19.6	35.8	1.6	37.7	37.7	16.2	52.3	52.3
Actuated g/C Ratio	0.22	0.22		0.22	0.22	0.40	0.02	0.42	0.42	0.18	0.58	0.58
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	288	350		288	394	607	31	1440	634	600	1998	872
v/s Ratio Prot		0.02			0.02	0.14	0.01	0.18		c0.14	c0.38	
v/s Ratio Perm	0.04			c0.18		0.17			0.01			0.04
v/c Ratio	0.19	0.09		0.83	0.08	0.79	0.35	0.42	0.02	0.80	0.65	0.07
Uniform Delay, d1	28.8	28.1		33.6	28.0	23.8	43.7	18.4	15.3	35.3	12.7	8.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.74	0.97	0.95	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0		16.9	0.0	6.2	2.4	0.9	0.0	6.8	1.7	0.2
Delay (s)	28.9	28.2		50.5	28.1	30.0	34.7	18.7	14.6	42.1	14.4	8.4
Level of Service	C	C		D	C	C	C	B	B	D	B	A
Approach Delay (s)		28.6			36.4			18.9			21.4	
Approach LOS		C			D			B			C	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	250	120	385	0	0	0	0	315	1	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.82	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4451	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.104						0.950	0.953	
Satd. Flow (perm)	0	4451	1538	188	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1350	139	133	428	0	0	0	0	350	1	539
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1350	139	133	428	0	0	0	0	175	176	539
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

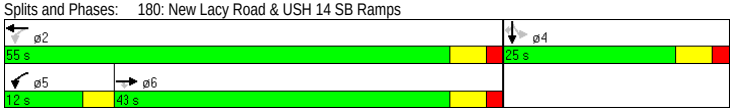
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.62	0.18	0.52	0.20					0.47	0.47	0.88
Control Delay		16.8	12.9	8.9	1.1					31.2	31.2	46.6
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		16.8	12.9	8.9	1.1					31.2	31.2	46.6
90th %ile Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		37.8	37.8	7.7	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		38.7	38.7	6.8	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		39.4	39.4	6.1	49.0					19.0	19.0	19.0
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		43.5	43.5	6.0	53.0					15.0	15.0	15.0
10th %ile Term Code		Coord	Coord	Min	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		193	37	0	0					78	78	146
Queue Length 95th (ft)		255	74	13	0					141	142	#236
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		2185	755	286	2140					388	389	643
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.62	0.18	0.47	0.20					0.45	0.45	0.84

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	250	120	385	0	0	0	0	315	1	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		*0.82	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4451	1538	1719	3438					1633	1638	2707
Flt Permitted		1.00	1.00	0.10	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4451	1538	189	3438					1633	1638	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1350	139	133	428	0	0	0	0	350	1	539
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1350	139	133	428	0	0	0	0	175	176	539
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		39.3	39.3	49.8	49.8					18.2	18.2	18.2
Effective Green, g (s)		39.3	39.3	49.8	49.8					18.2	18.2	18.2
Actuated g/C Ratio		0.49	0.49	0.62	0.62					0.23	0.23	0.23
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		2187	756	252	2140					372	373	616
v/s Ratio Prot		c0.30		c0.05	0.12							
v/s Ratio Perm			0.09	0.28						0.11	0.11	c0.20
v/c Ratio		0.62	0.18	0.53	0.20					0.47	0.47	0.88
Uniform Delay, d1		14.9	11.4	8.9	6.5					26.7	26.7	29.8
Progression Factor		1.00	1.00	0.29	0.14					1.00	1.00	1.00
Incremental Delay, d2		1.3	0.5	0.9	0.2					0.3	0.3	12.8
Delay (s)		16.2	11.9	3.4	1.1					27.1	27.1	42.6
Level of Service		B	B	A	A					C	C	D
Approach Delay (s)		15.8			1.6			0.0			36.5	
Approach LOS		B			A			A			D	

Intersection Summary

HCM Average Control Delay	19.3	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		15.5	
Intersection Capacity Utilization	62.3%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

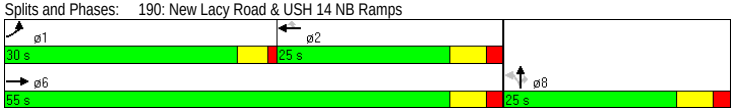
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	940	590	0	0	340	295	165	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1044	656	0	0	378	164	183	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1044	656	0	0	378	164	0	184	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.28			0.41	0.40		0.64	0.33			
Control Delay	18.5	2.0			26.6	28.8		41.0	31.9			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	18.5	2.0			26.6	28.8		41.0	31.9			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	31.6	55.1			19.0	19.0	12.9	12.9	12.9			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	29.5	57.3			23.3	23.3	10.7	10.7	10.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	27.1	58.0			26.4	26.4	10.0	10.0	10.0			
10th %ile Term Code	Gap	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	231	10			85	70		87	39			
Queue Length 95th (ft)	#394	37			127	128		142	74			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1201	2348			917	410		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.87	0.28			0.41	0.40		0.45	0.24			

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 55 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	940	590	0	0	340	295	165	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1044	656	0	0	378	164	183	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1044	656	0	0	378	164	0	184	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	28.8	54.6			21.3	21.3		13.4	13.4			
Effective Green, g (s)	28.8	54.6			21.3	21.3		13.4	13.4			
Actuated g/C Ratio	0.36	0.68			0.27	0.27		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1201	2346			915	409		289	258			
v/s Ratio Prot	c0.31	0.19			c0.11							
v/s Ratio Perm						0.11		0.11	0.06			
v/c Ratio	0.87	0.28			0.41	0.40		0.64	0.33			
Uniform Delay, d1	23.8	5.0			24.2	24.1		31.0	29.4			
Progression Factor	0.40	0.32			1.00	1.00		1.00	1.00			
Incremental Delay, d2	5.4	0.3			1.4	2.9		3.4	0.3			
Delay (s)	14.8	1.9			25.6	27.0		34.4	29.6			
Level of Service	B	A			C	C		C	C			
Approach Delay (s)		9.8			26.0			32.9			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	210	120	175	455	140	115	340	70	260	860	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	155		200	150		175	150		200
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00		0.98	1.00		0.97	1.00		0.97
Frt		0.945				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1700	0	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.132			0.543			0.154			0.434		
Satd. Flow (perm)	239	1700	0	980	1810	1512	278	3438	1493	783	3438	1495
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	233	133	194	506	78	128	378	39	289	956	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	366	0	194	506	78	128	378	39	289	956	175
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	11.0	45.0	0.0	34.0	34.0	34.0	12.0	30.0	30.0	15.0	33.0	33.0
Total Split (%)	12.2%	50.0%	0.0%	37.8%	37.8%	37.8%	13.3%	33.3%	33.3%	16.7%	36.7%	36.7%
Maximum Green (s)	7.5	39.0		28.0	28.0	28.0	8.5	24.0	24.0	11.5	27.0	27.0
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

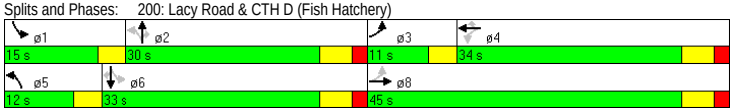
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.62	0.51		0.66	0.94	0.17	0.54	0.38	0.09	0.60	0.86	0.36
Control Delay	27.0	22.2		39.5	57.3	23.9	23.7	27.8	25.7	17.0	34.5	21.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	22.2		39.5	57.3	23.9	23.7	27.8	25.7	17.0	34.5	21.6
90th %ile Green (s)	7.5	39.0		28.0	28.0	28.0	8.5	24.0	24.0	11.5	27.0	27.0
90th %ile Term Code	Max	Hold		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	7.5	39.0		28.0	28.0	28.0	8.5	24.0	24.0	11.5	27.0	27.0
70th %ile Term Code	Max	Hold		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	7.5	39.0		28.0	28.0	28.0	8.4	24.0	24.0	11.5	27.1	27.1
50th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	7.5	38.8		27.8	27.8	27.8	7.1	24.0	24.0	11.7	28.6	28.6
30th %ile Term Code	Max	Hold		Gap	Gap	Gap	Gap	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	6.0	32.3		22.8	22.8	22.8	6.0	33.7	33.7	8.5	36.2	36.2
10th %ile Term Code	Min	Hold		Gap	Gap	Gap	Min	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	45	146		94	273	32	41	93	17	127	302	90
Queue Length 95th (ft)	#82	227		#173	#460	66	75	134	42	45	#386	m88
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300			155		200	150		175	150		200
Base Capacity (vph)	230	737		305	563	470	250	991	430	490	1115	485
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.50		0.64	0.90	0.17	0.51	0.38	0.09	0.59	0.86	0.36

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	210	120	175	455	140	115	340	70	260	860	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1701		1714	1810	1512	1719	3438	1494	1717	3438	1496
Flt Permitted	0.13	1.00		0.54	1.00	1.00	0.15	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)	238	1701		980	1810	1512	278	3438	1494	785	3438	1496
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	139	233	133	194	506	78	128	378	39	289	956	175
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	139	366	0	194	506	78	128	378	39	289	956	175
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	37.6	37.6		26.9	26.9	26.9	33.7	26.0	26.0	40.1	29.2	29.2
Effective Green, g (s)	37.6	37.6		26.9	26.9	26.9	33.7	26.0	26.0	40.1	29.2	29.2
Actuated g/C Ratio	0.42	0.42		0.30	0.30	0.30	0.37	0.29	0.29	0.45	0.32	0.32
Clearance Time (s)	3.5	6.0		6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	218	711		293	541	452	227	993	432	463	1115	485
v/s Ratio Prot	c0.05	0.22			c0.28		0.05	0.11		c0.08	c0.28	
v/s Ratio Perm	0.22			0.20		0.05	0.16		0.03	0.20		0.12
v/c Ratio	0.64	0.51		0.66	0.94	0.17	0.56	0.38	0.09	0.62	0.86	0.36
Uniform Delay, d1	19.8	19.4		27.6	30.7	23.3	20.5	25.6	23.4	16.8	28.5	23.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.90	0.80
Incremental Delay, d2	4.4	0.3		4.3	23.3	0.1	1.9	1.1	0.4	1.5	6.9	1.6
Delay (s)	24.3	19.7		31.9	54.0	23.4	22.4	26.7	23.8	14.8	32.6	20.3
Level of Service	C	B		C	D	C	C	C	C	B	C	C
Approach Delay (s)		21.0			45.4			25.5			27.5	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	30.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	340	15	210	325	5	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.875	
Flt Protected			0.950		0.996	
Satd. Flow (prot)	1810	1538	1719	1810	1577	0
Flt Permitted			0.950		0.996	
Satd. Flow (perm)	1810	1538	1719	1810	1577	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	947	
Travel Time (s)	43.1			28.5	25.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	378	17	233	361	6	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	378	17	233	361	78	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	15	210	325	5	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	378	17	233	361	6	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			394		1206	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			394		1206	378
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		97	89
cM capacity (veh/h)			1148		159	662

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	378	17	233	361	78
Volume Left	0	0	233	0	6
Volume Right	0	17	0	0	72
cSH	1700	1700	1148	1700	541
Volume to Capacity	0.22	0.01	0.20	0.21	0.14
Queue Length 95th (ft)	0	0	19	0	12
Control Delay (s)	0.0	0.0	8.9	0.0	12.8
Lane LOS			A		B
Approach Delay (s)	0.0		3.5		12.8
Approach LOS					B

Intersection Summary				
Average Delay		2.9		
Intersection Capacity Utilization		43.8%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	20	480	450	30	35	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			125	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850	0.938	
Flt Protected		0.998			0.974	
Satd. Flow (prot)	0	1806	1810	1538	1653	0
Flt Permitted		0.998			0.974	
Satd. Flow (perm)	0	1806	1810	1538	1653	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		2276	991		275	
Travel Time (s)		44.3	19.3		7.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	22	533	500	33	39	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	555	500	33	72	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	480	450	30	35	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	533	500	33	39	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			991			
pX, platoon unblocked						
vC, conflicting volume	533				1078	500
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	533				1078	500
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				83	94
cM capacity (veh/h)	1019				234	565

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	556	500	33	72
Volume Left	22	0	0	39
Volume Right	0	0	33	33
cSH	1019	1700	1700	320
Volume to Capacity	0.02	0.29	0.02	0.23
Queue Length 95th (ft)	2	0	0	21
Control Delay (s)	0.6	0.0	0.0	19.5
Lane LOS	A			C
Approach Delay (s)	0.6	0.0		19.5
Approach LOS				C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

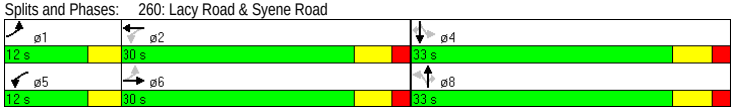
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	390	50	210	165	25	30	90	1	65	455	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00		0.97	0.99		0.97
Frt		0.983			0.980				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1773	0	1719	1767	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.626			0.223			0.213			0.692		
Satd. Flow (perm)	1128	1773	0	403	1767	0	384	1810	1497	1245	1810	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	433	56	233	183	28	33	100	1	72	506	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	489	0	233	211	0	33	100	1	72	506	158
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	1	6		5	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.0		9.5	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	12.0	30.0	0.0	12.0	30.0	0.0	33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	16.0%	40.0%	0.0%	16.0%	40.0%	0.0%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	8.5	24.0		8.5	24.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		None	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.14	0.84		0.64	0.31		0.26	0.17	0.00	0.18	0.86	0.32
Control Delay	9.9	38.4		19.8	19.2		23.6	17.5	16.0	18.0	37.7	19.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	38.4		19.8	19.2		23.6	17.5	16.0	18.0	37.7	19.7
90th %ile Green (s)	8.3	24.0		8.5	24.2		27.0	27.0	27.0	27.0	27.0	27.0
90th %ile Term Code	Gap	Max		Max	Hold		Hold	Hold	Hold	Max	Max	Max
70th %ile Green (s)	7.1	24.0		8.5	25.4		27.0	27.0	27.0	27.0	27.0	27.0
70th %ile Term Code	Gap	Max		Max	Hold		Hold	Hold	Hold	Max	Max	Max
50th %ile Green (s)	6.2	24.0		8.5	26.3		25.8	25.8	25.8	25.8	25.8	25.8
50th %ile Term Code	Gap	Max		Max	Hold		Hold	Hold	Hold	Gap	Gap	Gap
30th %ile Green (s)	6.0	24.0		8.5	26.5		20.6	20.6	20.6	20.6	20.6	20.6
30th %ile Term Code	Min	Max		Max	Hold		Hold	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	0.0	17.5		7.2	28.2		14.3	14.3	14.3	14.3	14.3	14.3
10th %ile Term Code	Skip	Gap		Gap	Hold		Hold	Hold	Hold	Gap	Gap	Gap
Queue Length 50th (ft)	18	205		55	69		11	31	0	22	205	52
Queue Length 95th (ft)	39	#378		#119	131		33	63	3	51	#355	97
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	624	622		371	679		151	715	591	492	715	591
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.79		0.63	0.31		0.22	0.14	0.00	0.15	0.71	0.27

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 69.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 75	
70th %ile Actuated Cycle: 75	
50th %ile Actuated Cycle: 73.8	
30th %ile Actuated Cycle: 68.6	
10th %ile Actuated Cycle: 54.5	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	390	50	210	165	25	30	90	1	65	455	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		3.5	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1714	1773		1718	1767		1714	1810	1496	1707	1810	1496
Flt Permitted	0.63	1.00		0.22	1.00		0.21	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	1129	1773		404	1767		384	1810	1496	1244	1810	1496
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	83	433	56	233	183	28	33	100	1	72	506	158
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	83	489	0	233	211	0	33	100	1	72	506	158
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	28.8	23.6		35.0	26.7		22.6	22.6	22.6	22.6	22.6	22.6
Effective Green, g (s)	28.8	23.6		35.0	26.7		22.6	22.6	22.6	22.6	22.6	22.6
Actuated g/C Ratio	0.41	0.34		0.50	0.38		0.32	0.32	0.32	0.32	0.32	0.32
Clearance Time (s)	3.5	6.0		3.5	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	508	598		358	674		124	584	483	402	584	483
v/s Ratio Prot	0.01	c0.28		c0.08	0.12			0.06			c0.28	
v/s Ratio Perm	0.06			0.25			0.09		0.00	0.06		0.11
v/c Ratio	0.16	0.82		0.65	0.31		0.27	0.17	0.00	0.18	0.87	0.33
Uniform Delay, d1	12.7	21.2		12.1	15.2		17.6	17.0	16.1	17.0	22.3	17.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	9.6		3.2	0.6		0.4	0.1	0.0	0.1	12.4	0.1
Delay (s)	12.8	30.8		15.4	15.8		18.0	17.0	16.1	17.1	34.7	18.1
Level of Service	B	C		B	B		B	B	B	B	C	B
Approach Delay (s)		28.2			15.6			17.3			29.4	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Volume
270: Lacy Road & New Lacy Road

1/7/2009

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	205	250	230	20	15	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	100			100	100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1790	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1790	0	1719	1538
Link Speed (mph)		35	35		35	
Link Distance (ft)		753	1231		431	
Travel Time (s)		14.7	24.0		8.4	
Confl. Peds. (#/hr)	5			5	5	5
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	228	278	256	22	17	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	278	278	0	17	189
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
270: Lacy Road & New Lacy Road

1/7/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	205	250	230	20	15	170
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	228	278	256	22	17	189
Pedestrians		5	5		5	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh)		2	2			
Upstream signal (ft)		753				
pX, platoon unblocked						
vC, conflicting volume	283				1010	277
vC1, stage 1 conf vol					272	
vC2, stage 2 conf vol					738	
vCu, unblocked vol	283				1010	277
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	82				95	75
cM capacity (veh/h)	1257				361	749

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	228	278	278	17	189
Volume Left	228	0	0	17	0
Volume Right	0	0	22	0	189
cSH	1257	1700	1700	361	749
Volume to Capacity	0.18	0.16	0.16	0.05	0.25
Queue Length 95th (ft)	17	0	0	4	25
Control Delay (s)	8.5	0.0	0.0	15.5	11.4
Lane LOS	A			C	B
Approach Delay (s)	3.8		0.0	11.7	
Approach LOS				B	

Intersection Summary			
Average Delay		4.4	
Intersection Capacity Utilization		39.6%	ICU Level of Service
Analysis Period (min)		15	

Volume
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	10	75	10	145	10	410	25	30	1265	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		100	150		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.958		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1734	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.954			0.958		0.950			0.950		
Satd. Flow (perm)	0	1726	1538	0	1734	1538	1719	3438	1538	1719	3438	1538
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	11	83	11	161	11	456	28	33	1406	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	11	0	94	161	11	456	28	33	1406	56
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	10	75	10	145	10	410	25	30	1265	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	1	11	83	11	161	11	456	28	33	1406	56
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1899	1988	713	1269	2016	238	1466			488		
vC1, stage 1 conf vol	1477	1477		483	483							
vC2, stage 2 conf vol	422	511		786	1533							
vCu, unblocked vol	1899	1988	713	1269	2016	238	1466			488		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	99	97	70	92	78	97			97		
cM capacity (veh/h)	116	165	365	275	147	748	440			1046		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	23	11	94	161	11	228	228	28	33	703	703	56
Volume Left	22	0	83	0	11	0	0	0	33	0	0	0
Volume Right	0	11	0	161	0	0	0	28	0	0	0	56
cSH	118	365	249	748	440	1700	1700	1700	1046	1700	1700	1700
Volume to Capacity	0.20	0.03	0.38	0.22	0.03	0.13	0.13	0.02	0.03	0.41	0.41	0.03
Queue Length 95th (ft)	18	2	42	20	2	0	0	0	2	0	0	0
Control Delay (s)	43.0	15.2	28.0	11.1	13.4	0.0	0.0	0.0	8.6	0.0	0.0	0.0
Lane LOS	E	C	D	B	B				A			
Approach Delay (s)	34.0		17.4		0.3				0.2			
Approach LOS	D		C									

Intersection Summary					
Average Delay	2.7				
Intersection Capacity Utilization	55.8%	ICU Level of Service		B	
Analysis Period (min)	15				

Volume
310: Nobel Drive & Research Park Drive

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	15	1	1	185	15	15	1	1	15	1	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.989			0.993			0.890	
Flt Protected	0.950			0.950				0.957			0.991	
Satd. Flow (prot)	1719	1795	0	1719	1790	0	0	1720	0	0	1596	0
Flt Permitted	0.950			0.950				0.957			0.991	
Satd. Flow (perm)	1719	1795	0	1719	1790	0	0	1720	0	0	1596	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	33	17	1	1	206	17	17	1	1	17	1	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	18	0	1	223	0	0	19	0	0	96	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	15	1	1	185	15	15	1	1	15	1	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	17	1	1	206	17	17	1	1	17	1	78
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	227			23			380	318	27	311	311	224
vC1, stage 1 conf vol							89	89		221	221	
vC2, stage 2 conf vol							291	229		90	89	
vCu, unblocked vol	227			23			380	318	27	311	311	224
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			97	100	100	98	100	90
cM capacity (veh/h)	1318			1567			584	644	1031	725	669	801

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	18	1	222	19	96
Volume Left	33	0	1	0	17	17
Volume Right	0	1	0	17	1	78
cSH	1318	1700	1567	1700	603	785
Volume to Capacity	0.03	0.01	0.00	0.13	0.03	0.12
Queue Length 95th (ft)	2	0	0	0	2	10
Control Delay (s)	7.8	0.0	7.3	0.0	11.2	10.2
Lane LOS	A		A		B	B
Approach Delay (s)	5.1		0.0		11.2	10.2
Approach LOS					B	B

Intersection Summary					
Average Delay		3.7			
Intersection Capacity Utilization		31.0%	ICU Level of Service		A
Analysis Period (min)		15			

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	75	85	270	25	215	855
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	83	94	300	28	239	950
Shared Lane Traffic (%)						
Lane Group Flow (vph)	83	94	300	28	239	950
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	85	270	25	215	855
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	94	300	28	239	950
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1263	160			333	
vC1, stage 1 conf vol	305					
vC2, stage 2 conf vol	958					
vCu, unblocked vol	1263	160			333	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	89			80	
cM capacity (veh/h)	248	840			1197	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	83	94	150	150	28	239	475	475
Volume Left	83	0	0	0	0	239	0	0
Volume Right	0	94	0	0	28	0	0	0
cSH	248	840	1700	1700	1700	1197	1700	1700
Volume to Capacity	0.34	0.11	0.09	0.09	0.02	0.20	0.28	0.28
Queue Length 95th (ft)	35	9	0	0	0	19	0	0
Control Delay (s)	26.6	9.8	0.0	0.0	0.0	8.8	0.0	0.0
Lane LOS	D	A				A		
Approach Delay (s)	17.7		0.0			1.8		
Approach LOS	C							

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	175	10	25	170	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.993				0.876	
Flt Protected				0.994	0.996	
Satd. Flow (prot)	1797	0	0	1799	1579	0
Flt Permitted				0.994	0.996	
Satd. Flow (perm)	1797	0	0	1799	1579	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	194	11	28	189	1	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	205	0	0	217	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill

1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	175	10	25	170	1	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	194	11	28	189	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			206		444	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			206		444	200
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1348		554	833

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	206	217	12
Volume Left	0	28	1
Volume Right	11	0	11
cSH	1700	1348	797
Volume to Capacity	0.12	0.02	0.02
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	1.1	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	1.1	9.6
Approach LOS			A

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	33.5%	ICU Level of Service		A
Analysis Period (min)	15			

```
*******************************************************************************
*                                                                             *
*   9:1:09               2035 BACK - LACY/FAHEY GLEN                      14  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*    5  320    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   10    5    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  460   10    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     325     15    470                  * AVEDEL  s   5.8 *
* CAPACITY    veh    1021    848   1024                  * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.07   0.11                  * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.09   0.14                  *                   *
* AVE QUEUE   veh       0      0      1                  * VEHIC HRS   1.3 *
* MAX QUEUE   veh       1      0      1                  * COST    $    20 *
*                                                        *                    *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09               2035 BACK - LACY/FAHEY GLEN                      15  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*    5  450    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    5    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  435   10    0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     455     10    445                  * AVEDEL  s   6.2 *
* CAPACITY    veh    1021    775   1024                  * LOS   SIG     A *
* AVE DELAY  mins    0.10   0.08   0.10                  * LOS UNSIG     A *
* MAX DELAY  mins    0.14   0.10   0.14                  *                   *
* AVE QUEUE   veh       1      0      1                  * VEHIC HRS   1.6 *
* MAX QUEUE   veh       1      0      1                  * COST    $    23 *
*                                                        *                    *
*******************************************************************************
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*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - LACY/FAHEY GLEN                    16  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*    5  320    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   10    5    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  460   10    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     325     15    470              * AVEDEL  s   4.4 *
* CAPACITY    veh    1218   1045   1221              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.06   0.08              * LOS UNSIG     A *
* MAX DELAY  mins    0.09   0.07   0.10              *                      *
* AVE QUEUE   veh       0      0      1              * VEHIC HRS   1.0 *
* MAX QUEUE   veh       0      0      1              * COST    $    15 *
*                                                    *                      *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - LACY/FAHEY GLEN                    17  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB LACY  *1.05*    5  450    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    5    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  435   10    0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     455     10    445              * AVEDEL  s   4.6 *
* CAPACITY    veh    1218    972   1221              * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.06   0.08              * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.08   0.10              *                      *
* AVE QUEUE   veh       1      0      1              * VEHIC HRS   1.2 *
* MAX QUEUE   veh       1      0      1              * COST    $    17 *
*                                                    *                      *
*****************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - CHERYL/SYENE                       22  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   50.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*    5  125   55  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  370  295   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  190  650  100  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  260   65   45  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     185    690    940    370          * AVEDEL  s  10.2 *
* CAPACITY    veh    1589    907   1823    616          * LOS   SIG     B *
* AVE DELAY  mins    0.04   0.30   0.07   0.26          * LOS UNSIG     B *
* MAX DELAY  mins    0.05   0.49   0.10   0.42          *                  *
* AVE QUEUE   veh       0      4      1      2          * VEHIC HRS   6.2 *
* MAX QUEUE   veh       0      5      1      2          * COST    $    93 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - CHERYL/SYENE                       23  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   50.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   25  635  280  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  100   85    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   55  130  465  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   50  315  210  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     940    190    650    575          * AVEDEL  s  31.5 *
* CAPACITY    veh    1065    432   1827    709          * LOS   SIG     C *
* AVE DELAY  mins    0.88   0.25   0.05   0.57          * LOS UNSIG     D *
* MAX DELAY  mins    1.95   0.38   0.07   1.08          *                  *
* AVE QUEUE   veh      14      1      1      6          * VEHIC HRS  20.6 *
* MAX QUEUE   veh      31      1      1     10          * COST    $   309 *
*                                                        *                    *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2035 BACK - CHERYL/SYENE                  24  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.31   4.27   7.92   4.27     * TIME PERIOD     min    90  *
* L'   (m)   50.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB CHERYL*1.05*    5  125   55  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  370  295   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  190  650  100  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  260   65   45  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     185    690    940    370     * AVEDEL  s   5.8 *
* CAPACITY    veh    1786   1105   2020    813     * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.15   0.06   0.14     * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.22   0.08   0.20     *                    *
* AVE QUEUE   veh       0      2      1      1     * VEHIC HRS   3.5 *
* MAX QUEUE   veh       0      2      1      1     * COST    $    52 *
*                                                  *                    *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2035 BACK - CHERYL/SYENE                  25  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.31   4.27   7.92   4.27     * TIME PERIOD     min    90  *
* L'   (m)   50.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB CHERYL*1.05*   25  635  280  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  100   85    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   55  130  465  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   50  315  210  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     940    190    650    575     * AVEDEL  s   9.7 *
* CAPACITY    veh    1262    628   2024    906     * LOS   SIG     A *
* AVE DELAY  mins    0.23   0.14   0.04   0.19     * LOS UNSIG     A *
* MAX DELAY  mins    0.41   0.20   0.06   0.29     *                    *
* AVE QUEUE   veh       4      0      0      2     * VEHIC HRS   6.3 *
* MAX QUEUE   veh       6      1      1      3     * COST    $    95 *
*                                                  *                    *
*************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - CHERYL/NEW LACY                    26  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   55  485    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  510   50    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  890  540    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     540    560   1430              * AVEDEL  s  17.6 *
* CAPACITY    veh    1700    770   1640              * LOS   SIG     B *
* AVE DELAY  mins    0.05   0.31   0.38              * LOS UNSIG     C *
* MAX DELAY  mins    0.07   0.52   0.73              *                      *
* AVE QUEUE   veh       0      3      9              * VEHIC HRS  12.4 *
* MAX QUEUE   veh       1      4     16              * COST    $   185 *
*                                                    *                      *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - CHERYL/NEW LACY                    27  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   35  910    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  400   40    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  610  340    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     945    440    950              * AVEDEL  s  13.5 *
* CAPACITY    veh    1849    544   1647              * LOS   SIG     B *
* AVE DELAY  mins    0.07   0.87   0.09              * LOS UNSIG     B *
* MAX DELAY  mins    0.09   1.74   0.12              *                      *
* AVE QUEUE   veh       1      7      1              * VEHIC HRS   8.8 *
* MAX QUEUE   veh       1     13      2              * COST    $   132 *
*                                                    *                      *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - CHERYL/NEW LACY                    28  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   55  485    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  510   50    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  890  540    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     540    560   1430              * AVEDEL  s   8.0 *
* CAPACITY    veh    1897    967   1837              * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.15   0.16              * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.22   0.27              *                      *
* AVE QUEUE   veh       0      1      4              * VEHIC HRS   5.6 *
* MAX QUEUE   veh       0      2      6              * COST    $    85 *
*                                                    *                      *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2035 BACK - CHERYL/NEW LACY                    29  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   4.27   7.31           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   35  910    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  400   40    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  610  340    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     945    440    950              * AVEDEL  s   5.3 *
* CAPACITY    veh    2046    742   1844              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.21   0.07              * LOS UNSIG     A *
* MAX DELAY  mins    0.07   0.34   0.09              *                      *
* AVE QUEUE   veh       1      2      1              * VEHIC HRS   3.5 *
* MAX QUEUE   veh       1      2      1              * COST    $    52 *
*                                                    *                      *
*****************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - IRISH/SYENE                        13  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*   35   50  100  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  765   95  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   25   65   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   40  230   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     185    861    100    280          * AVEDEL  s  36.0 *
* CAPACITY    veh     887    937    492    932          * LOS   SIG     D *
* AVE DELAY  mins    0.08   0.93   0.15   0.09          * LOS UNSIG     E *
* MAX DELAY  mins    0.11   1.90   0.21   0.12          *                  *
* AVE QUEUE   veh       0     14      0      0          * VEHIC HRS  14.3 *
* MAX QUEUE   veh       0     27      0      0          * COST    $   214 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - IRISH/SYENE                        14  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*  110   60   15  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  105   45  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*    1   50   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  100  590   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     185    151     61    715          * AVEDEL  s  11.5 *
* CAPACITY    veh     678    971    934    968          * LOS   SIG     B *
* AVE DELAY  mins    0.12   0.07   0.07   0.25          * LOS UNSIG     B *
* MAX DELAY  mins    0.17   0.09   0.09   0.39          *                  *
* AVE QUEUE   veh       0      0      0      3          * VEHIC HRS   3.6 *
* MAX QUEUE   veh       0      0      0      4          * COST    $    53 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - IRISH/SYENE                        15  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*   35   50  100  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  765   95  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   25   65   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   40  230   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     185    861    100    280          * AVEDEL  s  10.3 *
* CAPACITY    veh    1084   1134    688   1129          * LOS   SIG     B *
* AVE DELAY  mins    0.07   0.24   0.10   0.07          * LOS UNSIG     B *
* MAX DELAY  mins    0.08   0.38   0.14   0.09          *                  *
* AVE QUEUE   veh       0      3      0      0          * VEHIC HRS   4.1 *
* MAX QUEUE   veh       0      5      0      0          * COST    $    61 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BACK - IRISH/SYENE                        16  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*  110   60   15  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  105   45  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*    1   50   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  100  590   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     185    151     61    715          * AVEDEL  s   6.7 *
* CAPACITY    veh     875   1168   1132   1165          * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.06   0.05   0.13          * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.07   0.07   0.19          *                  *
* AVE QUEUE   veh       0      0      0      2          * VEHIC HRS   2.1 *
* MAX QUEUE   veh       0      0      0      2          * COST    $    31 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09              2035 BACK - CHERYL/RESEARCH PARK                  21  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   70  680  145  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   20   25   40  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   30  290    5  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   30    5   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     895     85    325     50           * AVEDEL  s   3.3 *
* CAPACITY    veh    2084    581   1552    849           * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.12   0.05   0.07           * LOS UNSIG     A *
* MAX DELAY  mins    0.07   0.16   0.06   0.09           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   1.2 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    18 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09              2035 BACK - CHERYL/RESEARCH PARK                  22  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   35  415  105  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   15   10  160  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  800   25  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  205   30   65  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     555    185    840    300           * AVEDEL  s   7.0 *
* CAPACITY    veh    2013    717   1509    505           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.11   0.09   0.33           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.15   0.13   0.56           *                  *
* AVE QUEUE   veh       0      0      1      2           * VEHIC HRS   3.6 *
* MAX QUEUE   veh       0      0      2      3           * COST    $    55 *
*                                                        *                    *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09              2035 BACK - CHERYL/RESEARCH PARK                  23  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   70  680  145  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   20   25   40  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   30  290    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   30    5   15  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     895     85    325     50           * AVEDEL  s   2.7 *
* CAPACITY    veh    2281    779   1749   1046           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.09   0.04   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.11   0.05   0.08           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   1.0 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    15 *
*                                                        *                  *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09              2035 BACK - CHERYL/RESEARCH PARK                  24  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   35  415  105  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   15   10  160  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  800   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  205   30   65  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     555    185    840    300           * AVEDEL  s   4.4 *
* CAPACITY    veh    2210    914   1706    702           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.08   0.07   0.15           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.11   0.10   0.23           *                  *
* AVE QUEUE   veh       0      0      1      1           * VEHIC HRS   2.3 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    35 *
*                                                        *                  *
*****************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BACK - LACY/RESEARCH PARK                  11  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  220  245  145  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   70   70  135  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  275  190  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   20   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                      *
* FLOW        veh     610    275    490     40          * AVEDEL  s  10.6 *
* CAPACITY    veh     904    803    831    691          * LOS   SIG     B *
* AVE DELAY  mins    0.21   0.11   0.18   0.09          * LOS UNSIG     B *
* MAX DELAY  mins    0.32   0.15   0.26   0.12          *                      *
* AVE QUEUE   veh       2      1      1      0          * VEHIC HRS   4.1 *
* MAX QUEUE   veh       3      1      2      0          * COST    $    62 *
*                                                        *                      *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BACK - LACY/RESEARCH PARK                  12  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  170  295   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*  165   35  220  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  375   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  175   35   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                      *
* FLOW        veh     515    420    435    230          * AVEDEL  s   8.4 *
* CAPACITY    veh     968    823    856    666          * LOS   SIG     A *
* AVE DELAY  mins    0.13   0.15   0.14   0.14          * LOS UNSIG     A *
* MAX DELAY  mins    0.18   0.21   0.20   0.19          *                      *
* AVE QUEUE   veh       1      1      1      1          * VEHIC HRS   3.7 *
* MAX QUEUE   veh       1      1      1      1          * COST    $    56 *
*                                                        *                      *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BACK - LACY/RESEARCH PARK                  13  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  220  245  145  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   70   70  135  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  275  190  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   20   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                      *
* FLOW        veh     610    275    490     40          * AVEDEL  s   6.5 *
* CAPACITY    veh    1101   1000   1028    888          * LOS   SIG     A *
* AVE DELAY  mins    0.12   0.08   0.11   0.07          * LOS UNSIG     A *
* MAX DELAY  mins    0.17   0.11   0.15   0.09          *                      *
* AVE QUEUE   veh       1      0      1      0          * VEHIC HRS   2.6 *
* MAX QUEUE   veh       2      0      1      0          * COST    $    38 *
*                                                        *                      *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BACK - LACY/RESEARCH PARK                  14  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  170  295   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*  165   35  220  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  375   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  175   35   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                      *
* FLOW        veh     515    420    435    230          * AVEDEL  s   5.7 *
* CAPACITY    veh    1165   1020   1053    863          * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.10   0.10   0.09          * LOS UNSIG     A *
* MAX DELAY  mins    0.12   0.14   0.13   0.13          *                      *
* AVE QUEUE   veh       1      1      1      0          * VEHIC HRS   2.5 *
* MAX QUEUE   veh       1      1      1      0          * COST    $    38 *
*                                                        *                      *
*************************************************************************
```

APPENDIX E

BUILD TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS
WITH IMPROVEMENTS

APPENDIX E

Year 2025 Build Traffic Peak Hour Analysis *With Improvements*

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	275	15	1225	270	575	725	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	0.99		0.98	1.00		0.97
Frt		0.916				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1640	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.754			0.724			0.950			0.950		
Satd. Flow (perm)	1355	1640	0	1301	1810	1514	1707	3438	1514	3329	3438	1500
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	22	28	100	6	153	17	1361	150	639	806	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	50	0	100	6	153	17	1361	150	639	806	14
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	15.0	40.0	40.0	25.0	50.0	50.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	27.8%	27.8%	16.7%	44.4%	44.4%	27.8%	55.6%	55.6%
Maximum Green (s)	19.0	19.0		19.0	19.0	20.5	10.5	34.0	34.0	20.5	44.0	44.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

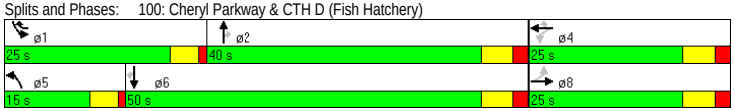
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.68	0.19		0.49	0.02	0.25	0.11	0.91	0.23	0.85	0.36	0.01
Control Delay	51.2	33.2		42.0	29.6	15.3	38.3	28.9	16.6	45.3	9.2	9.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	33.2		42.0	29.6	15.3	38.3	28.9	16.6	45.3	9.2	9.2
90th %ile Green (s)	19.0	19.0		19.0	19.0	20.5	8.0	34.0	34.0	20.5	46.5	46.5
90th %ile Term Code	Max	Max		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	16.5	16.5		16.5	16.5	23.0	8.0	34.0	34.0	23.0	49.0	49.0
70th %ile Term Code	Gap	Gap		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	13.9	13.9		13.9	13.9	21.8	0.0	37.8	37.8	21.8	64.1	64.1
50th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	11.3	11.3		11.3	11.3	19.7	0.0	42.5	42.5	19.7	66.7	66.7
30th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	10.0	10.0		10.0	10.0	16.6	0.0	46.9	46.9	16.6	68.0	68.0
10th %ile Term Code	Min	Min		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	78	25		53	3	50	9	217	44	176	76	2
Queue Length 95th (ft)	133	54		97	13	81	m15	#564	m78	#266	191	13
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	286	346		275	382	627	201	1492	657	788	2249	981
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.14		0.36	0.02	0.24	0.08	0.91	0.23	0.81	0.36	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	20	25	90	5	275	15	1225	270	575	725	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1638		1704	1810	1528	1719	3438	1514	3335	3438	1501
Flt Permitted	0.75	1.00		0.72	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1351	1638		1299	1810	1528	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	144	22	28	100	6	153	17	1361	150	639	806	14
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	50	0	100	6	153	17	1361	150	639	806	14
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	14.1	14.1		14.1	14.1	34.4	3.2	39.1	39.1	20.3	56.2	56.2
Effective Green, g (s)	14.1	14.1		14.1	14.1	34.4	3.2	39.1	39.1	20.3	56.2	56.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.38	0.04	0.43	0.43	0.23	0.62	0.62
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	212	257		204	284	584	61	1494	658	752	2147	937
v/s Ratio Prot		0.03			0.00	0.06	0.01	c0.40		c0.19	0.23	
v/s Ratio Perm	c0.11			0.08		0.04			0.10			0.01
v/c Ratio	0.68	0.19		0.49	0.02	0.26	0.28	0.91	0.23	0.85	0.38	0.01
Uniform Delay, d1	35.8	33.0		34.7	32.1	19.1	42.3	23.8	16.0	33.4	8.3	6.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.98	0.76	0.89	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1		0.7	0.0	0.1	0.7	7.6	0.6	8.6	0.5	0.0
Delay (s)	42.5	33.1		35.3	32.1	19.2	41.9	25.7	14.8	41.9	8.8	6.4
Level of Service	D	C		D	C	B	D	C	B	D	A	A
Approach Delay (s)		40.1			25.7			24.8			23.3	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	995	170	110	730	0	0	0	0	535	1	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.88	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4777	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.143						0.950	0.953	
Satd. Flow (perm)	0	4777	1538	259	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1106	94	122	811	0	0	0	0	594	1	933
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1106	94	122	811	0	0	0	0	297	298	933
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	33.0	33.0	12.0	45.0	0.0	0.0	0.0	0.0	35.0	35.0	35.0
Total Split (%)	0.0%	41.3%	41.3%	15.0%	56.3%	0.0%	0.0%	0.0%	0.0%	43.8%	43.8%	43.8%
Maximum Green (s)		27.0	27.0	8.5	39.0					29.0	29.0	29.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

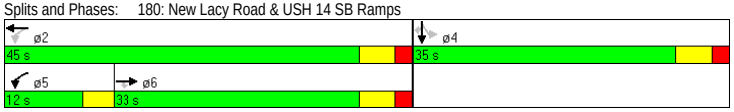
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.62	0.16	0.46	0.48					0.50	0.50	0.95
Control Delay		23.0	19.2	8.1	4.9					23.5	23.5	45.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		23.0	19.2	8.1	4.9					23.5	23.5	45.2
90th %ile Green (s)		27.0	27.0	8.5	39.0					29.0	29.0	29.0
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		27.1	27.1	8.4	39.0					29.0	29.0	29.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		28.1	28.1	7.4	39.0					29.0	29.0	29.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
30th %ile Green (s)		29.1	29.1	6.4	39.0					29.0	29.0	29.0
30th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
10th %ile Green (s)		38.7	38.7	0.0	38.7					29.3	29.3	29.3
10th %ile Term Code		Coord	Coord	Skip	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		173	32	7	54					120	120	252
Queue Length 95th (ft)		226	67	m6	7					196	196	#391
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		1791	577	289	1676					593	595	983
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.62	0.16	0.42	0.48					0.50	0.50	0.95

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 77 (96%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	995	170	110	730	0	0	0	0	535	1	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		*0.88	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4777	1538	1719	3438					1633	1637	2707
Flt Permitted		1.00	1.00	0.14	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4777	1538	259	3438					1633	1637	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1106	94	122	811	0	0	0	0	594	1	933
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1106	94	122	811	0	0	0	0	297	298	933
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		29.3	29.3	38.9	38.9					29.1	29.1	29.1
Effective Green, g (s)		29.3	29.3	38.9	38.9					29.1	29.1	29.1
Actuated g/C Ratio		0.37	0.37	0.49	0.49					0.36	0.36	0.36
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		1750	563	237	1672					594	595	985
v/s Ratio Prot		c0.23		0.04	c0.24							
v/s Ratio Perm			0.06	0.21						0.18	0.18	c0.34
v/c Ratio		0.63	0.17	0.51	0.49					0.50	0.50	0.95
Uniform Delay, d1		20.9	17.1	12.8	13.8					19.8	19.8	24.7
Progression Factor		1.00	1.00	0.37	0.29					1.00	1.00	1.00
Incremental Delay, d2		1.7	0.6	0.6	0.8					0.2	0.2	17.0
Delay (s)		22.7	17.8	5.4	4.8					20.0	20.0	41.7
Level of Service		C	B	A	A					C	C	D
Approach Delay (s)		22.3			4.9			0.0			33.3	
Approach LOS		C			A			A			C	

Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service		C
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	775	0	0	600	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	839	861	0	0	667	264	267	1	72	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	839	861	0	0	667	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

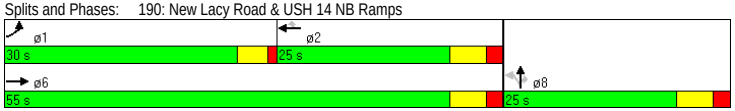
Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.38			0.63	0.56		0.79	0.24			
Control Delay	20.1	2.5			29.1	31.6		46.9	27.7			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	20.1	2.5			29.1	31.6		46.9	27.7			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
70th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	24.4	51.3			22.4	22.4	16.7	16.7	16.7			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	22.1	54.0			27.4	27.4	14.0	14.0	14.0			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	18.7	57.8			34.6	34.6	10.2	10.2	10.2			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	222	33			156	114		126	30			
Queue Length 95th (ft)	292	42			#249	#229		202	63			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1063	2244			1052	471		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.79	0.38			0.63	0.56		0.66	0.20			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	775	0	0	600	475	240	1	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	839	861	0	0	667	264	267	1	72	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	839	861	0	0	667	264	0	268	72	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	23.2	52.2			24.5	24.5		15.8	15.8			
Effective Green, g (s)	23.2	52.2			24.5	24.5		15.8	15.8			
Actuated g/C Ratio	0.29	0.65			0.31	0.31		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	967	2243			1053	471		340	304			
v/s Ratio Prot	c0.25	0.25			c0.19							
v/s Ratio Perm						0.17		0.16	0.05			
v/c Ratio	0.87	0.38			0.63	0.56		0.79	0.24			
Uniform Delay, d1	26.9	6.4			23.9	23.2		30.5	27.0			
Progression Factor	0.43	0.29			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.5	0.4			2.9	4.8		10.6	0.1			
Delay (s)	18.2	2.3			26.8	28.0		41.1	27.2			
Level of Service	B	A			C	C		D	C			
Approach Delay (s)		10.2			27.1			38.2			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	305	175	30	115	295	100	820	90	170	485	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		150	155		200	200		175	200		200
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	0.99		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.530			0.557			0.422			0.172		
Satd. Flow (perm)	956	1810	1514	1002	1810	1505	762	3438	1497	311	3438	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	378	339	97	33	128	164	111	911	50	189	539	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	339	97	33	128	164	111	911	50	189	539	67
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Detector Phase	3	8	8	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0	16.0	16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	20.0	40.0	40.0	20.0	20.0	20.0	12.0	38.0	38.0	12.0	38.0	38.0
Total Split (%)	22.2%	44.4%	44.4%	22.2%	22.2%	22.2%	13.3%	42.2%	42.2%	13.3%	42.2%	42.2%
Maximum Green (s)	16.5	34.0	34.0	14.0	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

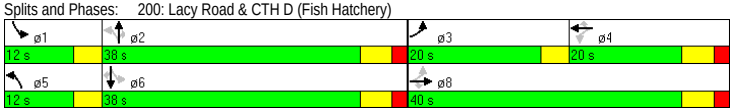
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0	10.0	10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0	10.0	10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.75	0.52	0.18	0.23	0.50	0.77	0.25	0.70	0.09	0.66	0.38	0.11
Control Delay	31.8	25.7	20.0	37.9	42.3	60.7	4.6	10.1	6.1	34.2	20.5	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	25.7	20.0	37.9	42.3	60.7	4.6	10.1	6.1	34.2	20.5	21.2
90th %ile Green (s)	16.5	34.0	34.0	14.0	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	16.5	34.0	34.0	14.0	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
70th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	17.0	34.5	34.5	14.0	14.0	14.0	7.5	31.5	31.5	8.5	32.5	32.5
50th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Gap	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	16.9	32.4	32.4	12.0	12.0	12.0	6.4	33.5	33.5	8.6	35.7	35.7
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	13.3	26.8	26.8	10.0	10.0	10.0	0.0	41.2	41.2	6.5	51.2	51.2
10th %ile Term Code	Gap	Hold	Hold	Min	Min	Min	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	158	143	36	17	67	89	6	78	3	44	86	20
Queue Length 95th (ft)	247	226	71	45	122	#179	m8	m38	m5	#168	154	57
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300		150	155		200	200		175	200		200
Base Capacity (vph)	512	686	574	156	282	234	471	1304	568	292	1401	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.49	0.17	0.21	0.45	0.70	0.24	0.70	0.09	0.65	0.38	0.11

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	340	305	175	30	115	295	100	820	90	170	485	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1716	1810	1513	1708	1810	1504	1717	3438	1497	1719	3438	1498
Flt Permitted	0.53	1.00	1.00	0.56	1.00	1.00	0.42	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	958	1810	1513	1001	1810	1504	763	3438	1497	312	3438	1498
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	378	339	97	33	128	164	111	911	50	189	539	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	378	339	97	33	128	164	111	911	50	189	539	67
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	32.3	32.3	32.3	12.8	12.8	12.8	40.3	34.1	34.1	44.1	36.0	36.0
Effective Green, g (s)	32.3	32.3	32.3	12.8	12.8	12.8	40.3	34.1	34.1	44.1	36.0	36.0
Actuated g/C Ratio	0.36	0.36	0.36	0.14	0.14	0.14	0.45	0.38	0.38	0.49	0.40	0.40
Clearance Time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	479	650	543	142	257	214	407	1303	567	280	1375	599
v/s Ratio Prot	c0.14	0.19			0.07		0.02	0.26		c0.06	0.16	
v/s Ratio Perm	c0.14		0.06	0.03		0.11	0.10		0.03	c0.27		0.04
v/c Ratio	0.79	0.52	0.18	0.23	0.50	0.77	0.27	0.70	0.09	0.68	0.39	0.11
Uniform Delay, d1	23.9	22.8	19.8	34.2	35.6	37.2	14.7	23.6	18.0	15.3	19.2	17.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.30	1.89	0.97	1.06
Incremental Delay, d2	7.8	0.3	0.1	0.3	0.6	13.7	0.1	1.9	0.2	4.8	0.8	0.4
Delay (s)	31.7	23.1	19.8	34.5	36.2	50.8	5.0	9.8	5.6	33.7	19.4	18.4
Level of Service	C	C	B	C	D	D	A	A	A	C	B	B
Approach Delay (s)		26.7			43.4			9.1			22.7	
Approach LOS		C			D			A			C	

Intersection Summary

HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	245	40	20	260	45	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.898	
Flt Protected			0.950		0.988	
Satd. Flow (prot)	1810	1538	1719	1810	1605	0
Flt Permitted			0.950		0.988	
Satd. Flow (perm)	1810	1538	1719	1810	1605	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	272	44	22	289	50	156
Shared Lane Traffic (%)						
Lane Group Flow (vph)	272	44	22	289	206	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	245	40	20	260	45	140
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	272	44	22	289	50	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			317		606	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			317		606	272
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	80
cM capacity (veh/h)			1227		447	759

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	272	44	22	289	206
Volume Left	0	0	22	0	50
Volume Right	0	44	0	0	156
cSH	1700	1700	1227	1700	649
Volume to Capacity	0.16	0.03	0.02	0.17	0.32
Queue Length 95th (ft)	0	0	1	0	34
Control Delay (s)	0.0	0.0	8.0	0.0	13.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.6		13.1
Approach LOS					B

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		34.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	380	5	15	415	1	5	1	20	1	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.898			0.886	
Flt Protected	0.950			0.950				0.990			0.996	
Satd. Flow (prot)	1719	1810	1538	1719	1810	0	0	1609	0	0	1597	0
Flt Permitted	0.950			0.950				0.990			0.996	
Satd. Flow (perm)	1719	1810	1538	1719	1810	0	0	1609	0	0	1597	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	422	6	17	461	1	6	1	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	422	6	17	462	0	0	29	0	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	380	5	15	415	1	5	1	20	1	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	422	6	17	461	1	6	1	22	1	1	11
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	462			433			972	956	432	978	961	467
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	462			433			972	956	432	978	961	467
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			97	100	96	99	100	98
cM capacity (veh/h)	1083			1106			216	246	612	211	245	587

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	17	422	6	17	462	29	13
Volume Left	17	0	0	17	0	6	1
Volume Right	0	0	6	0	1	22	11
cSH	1083	1700	1700	1106	1700	434	464
Volume to Capacity	0.02	0.25	0.00	0.02	0.27	0.07	0.03
Queue Length 95th (ft)	1	0	0	1	0	5	2
Control Delay (s)	8.4	0.0	0.0	8.3	0.0	13.9	13.0
Lane LOS	A			A		B	B
Approach Delay (s)	0.3			0.3		13.9	13.0
Approach LOS						B	B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	33.4%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	365	20	50	440	20	15	1	45	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		125	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992				0.850		0.901			0.934	
Flt Protected	0.950			0.950				0.988			0.976	
Satd. Flow (prot)	1719	1795	0	1719	1810	1538	0	1611	0	0	1650	0
Flt Permitted	0.950			0.950				0.988			0.976	
Satd. Flow (perm)	1719	1795	0	1719	1810	1538	0	1611	0	0	1650	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	406	22	56	489	22	17	1	50	17	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	428	0	56	489	22	0	68	0	0	35	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	365	20	50	440	20	15	1	45	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	406	22	56	489	22	17	1	50	17	1	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					991							
pX, platoon unblocked	0.95						0.95	0.95		0.95	0.95	0.95
vC, conflicting volume	511			428			1056	1061	417	1078	1050	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	454			428			1031	1036	417	1054	1024	431
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			91	99	92	90	99	97
cM capacity (veh/h)	1031			1116			182	203	630	166	207	585

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	11	428	56	489	22	68	34
Volume Left	11	0	56	0	0	17	17
Volume Right	0	22	0	0	22	50	17
cSH	1031	1700	1116	1700	1700	384	257
Volume to Capacity	0.01	0.25	0.05	0.29	0.01	0.18	0.13
Queue Length 95th (ft)	1	0	4	0	0	16	11
Control Delay (s)	8.5	0.0	8.4	0.0	0.0	16.4	21.2
Lane LOS	A		A			C	C
Approach Delay (s)	0.2		0.8			16.4	21.2
Approach LOS						C	C

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	40.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	285	5	50	425	55	25	345	165	30	115	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99		0.97	1.00		0.97
Frt		0.997			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1803	0	1719	1774	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.351			0.565			0.675			0.423		
Satd. Flow (perm)	634	1803	0	1019	1774	0	1214	1810	1497	763	1810	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	150	317	6	56	472	61	28	383	92	33	128	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	150	323	0	56	533	0	28	383	92	33	128	33
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.0	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	33.0	33.0	0.0	33.0	33.0	0.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	0.0%	55.0%	55.0%	0.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Maximum Green (s)	27.0	27.0		27.0	27.0		21.0	21.0	21.0	21.0	21.0	21.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

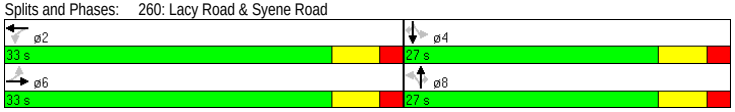
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.54	0.40		0.12	0.68		0.08	0.69	0.20	0.14	0.23	0.07
Control Delay	19.5	11.7		9.8	16.7		13.8	23.3	14.8	15.2	14.9	13.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	11.7		9.8	16.7		13.8	23.3	14.8	15.2	14.9	13.6
90th %ile Green (s)	27.0	27.0		27.0	27.0		21.0	21.0	21.0	21.0	21.0	21.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	27.0	27.0		27.0	27.0		18.7	18.7	18.7	18.7	18.7	18.7
70th %ile Term Code	Max	Max		Max	Max		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	23.4	23.4		23.4	23.4		15.2	15.2	15.2	15.2	15.2	15.2
50th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	17.4	17.4		17.4	17.4		11.4	11.4	11.4	11.4	11.4	11.4
30th %ile Term Code	Hold	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
10th %ile Term Code	Min	Min		Min	Min		Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	29	58		9	112		6	99	20	7	28	7
Queue Length 95th (ft)	91	129		29	241		21	190	51	25	65	23
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	361	1025		580	1009		537	801	662	338	801	662
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.32		0.10	0.53		0.05	0.48	0.14	0.10	0.16	0.05

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 49.2
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 60
70th %ile Actuated Cycle: 57.7
50th %ile Actuated Cycle: 50.6
30th %ile Actuated Cycle: 40.8
10th %ile Actuated Cycle: 37

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	285	5	50	425	55	25	345	165	30	115	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1715	1804		1713	1773		1707	1810	1495	1712	1810	1495
Flt Permitted	0.35	1.00		0.57	1.00		0.67	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	634	1804		1019	1773		1213	1810	1495	762	1810	1495
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	150	317	6	56	472	61	28	383	92	33	128	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	150	323	0	56	533	0	28	383	92	33	128	33
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	21.8	21.8		21.8	21.8		15.0	15.0	15.0	15.0	15.0	15.0
Effective Green, g (s)	21.8	21.8		21.8	21.8		15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.31	0.31	0.31	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	283	806		455	792		373	556	460	234	556	460
v/s Ratio Prot		0.18			c0.30			c0.21			0.07	
v/s Ratio Perm	0.24			0.05			0.02		0.06	0.04		0.02
v/c Ratio	0.53	0.40		0.12	0.67		0.08	0.69	0.20	0.14	0.23	0.07
Uniform Delay, d1	9.8	9.1		7.9	10.7		12.0	14.8	12.5	12.2	12.6	12.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.7		0.3	3.0		0.0	2.8	0.1	0.1	0.1	0.0
Delay (s)	13.2	9.8		8.2	13.6		12.0	17.7	12.6	12.3	12.7	12.0
Level of Service	B	A		A	B		B	B	B	B	B	B
Approach Delay (s)		10.9			13.1			16.4			12.5	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	13.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	15	90	5	150	5	980	305	500	210	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		200	150		200	500		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99	0.98		0.99	0.98	0.99		0.97	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.955		0.950			0.950		
Satd. Flow (prot)	0	1732	1538	0	1728	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.675			0.697		0.607			0.106		
Satd. Flow (perm)	0	1215	1509	0	1253	1509	1092	3438	1496	192	3438	1502
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	8	100	6	83	6	1089	169	556	233	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	8	0	106	83	6	1089	169	556	233	11
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	21.0	21.0	21.0	9.5	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	35.0	35.0	35.0	30.0	65.0	65.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	27.8%	27.8%	38.9%	38.9%	38.9%	33.3%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	19.0	19.0	19.0	19.0	29.0	29.0	29.0	26.5	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

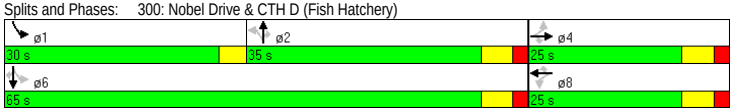
Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.32	0.04		0.59	0.39	0.01	0.84	0.30	0.91	0.09	0.01
Control Delay		38.6	31.3		49.4	39.3	20.8	34.4	23.3	37.7	2.1	2.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		38.6	31.3		49.4	39.3	20.8	34.4	23.3	37.7	2.1	2.0
90th %ile Green (s)	17.8	17.8	17.8	17.8	17.8	17.8	29.0	29.0	29.0	27.7	60.2	60.2
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	14.4	14.4	14.4	14.4	14.4	14.4	29.0	29.0	29.0	31.1	63.6	63.6
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	12.0	12.0	12.0	12.0	12.0	12.0	31.6	31.6	31.6	30.9	66.0	66.0
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	10.0	10.0	10.0	10.0	10.0	10.0	37.3	37.3	37.3	27.2	68.0	68.0
30th %ile Term Code	Min	Min	Min	Min	Min	Min	Coord	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	10.0	10.0	10.0	10.0	10.0	10.0	43.6	43.6	43.6	20.9	68.0	68.0
10th %ile Term Code	Hold	Hold	Hold	Min	Min	Min	Coord	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)		29	4		58	44	2	305	69	88	7	1
Queue Length 95th (ft)		62	16		104	82	11	#462	128	#474	13	m2
Internal Link Dist (ft)		186			710			1314			1278	
Turn Bay Length (ft)						200	150		200	500		100
Base Capacity (vph)		257	319		265	319	414	1303	567	631	2489	1087
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.22	0.03		0.40	0.26	0.01	0.84	0.30	0.88	0.09	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Nobel Drive & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	15	90	5	150	5	980	305	500	210	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1718	1504		1712	1504	1711	3438	1497	1719	3438	1502
Flt Permitted		0.67	1.00		0.70	1.00	0.61	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1211	1504		1250	1504	1092	3438	1497	192	3438	1502
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	50	6	8	100	6	83	6	1089	169	556	233	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	56	8	0	106	83	6	1089	169	556	233	11
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		12.8	12.8		12.8	12.8	34.1	34.1	34.1	65.2	65.2	65.2
Effective Green, g (s)		12.8	12.8		12.8	12.8	34.1	34.1	34.1	65.2	65.2	65.2
Actuated g/C Ratio		0.14	0.14		0.14	0.14	0.38	0.38	0.38	0.72	0.72	0.72
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		172	214		178	214	414	1303	567	607	2491	1088
v/s Ratio Prot								0.32		c0.28	0.07	
v/s Ratio Perm		0.05	0.01		c0.08	0.06	0.01		0.11	c0.38		0.01
v/c Ratio		0.33	0.04		0.60	0.39	0.01	0.84	0.30	0.92	0.09	0.01
Uniform Delay, d1		34.7	33.3		36.2	35.0	17.5	25.4	19.6	23.5	3.7	3.4
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.79	0.49	0.45
Incremental Delay, d2		0.4	0.0		3.5	0.4	0.1	6.5	1.3	17.9	0.1	0.0
Delay (s)		35.1	33.3		39.7	35.5	17.5	31.9	20.9	36.4	1.9	1.6
Level of Service		D	C		D	D	B	C	C	D	A	A
Approach Delay (s)		34.9			37.8			30.3			25.9	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
310: Nobel Drive & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	540	195	20	175	1	50	1	25	10	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960			0.999			0.956			0.959	
Flt Protected	0.950			0.950				0.968			0.990	
Satd. Flow (prot)	1719	1737	0	1719	1808	0	0	1675	0	0	1718	0
Flt Permitted	0.950			0.950				0.968			0.990	
Satd. Flow (perm)	1719	1737	0	1719	1808	0	0	1675	0	0	1718	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	600	217	22	194	1	56	1	28	11	28	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	817	0	22	195	0	0	85	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	540	195	20	175	1	50	1	25	10	25	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	600	217	22	194	1	56	1	28	11	28	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)		790										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	201			822			1088	1058	718	978	1166	205
vC1, stage 1 conf vol							813	813		244	244	
vC2, stage 2 conf vol							274	245		733	922	
vCu, unblocked vol	201			732			1033	1000	614	908	1122	205
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			83	100	93	97	90	98
cM capacity (veh/h)	1348			755			320	337	425	327	282	821

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	817	22	196	84	56
Volume Left	50	0	22	0	56	11
Volume Right	0	217	0	1	28	17
cSH	1348	1700	755	1700	349	364
Volume to Capacity	0.04	0.48	0.03	0.12	0.24	0.15
Queue Length 95th (ft)	3	0	2	0	23	13
Control Delay (s)	7.8	0.0	9.9	0.0	18.6	16.7
Lane LOS	A		A		C	C
Approach Delay (s)	0.4		1.0		18.6	16.7
Approach LOS					C	C

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	58.6%	ICU Level of Service		B
Analysis Period (min)	15			

Volume
320: Nobel Drive & Mica Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	95	225	185	110	125	40	10	40	25	35	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.895			0.920				0.850			0.850
Flt Protected	0.950			0.950				0.962			0.980	
Satd. Flow (prot)	1719	1620	0	1719	1665	0	0	1741	1538	0	1773	1538
Flt Permitted	0.950			0.950				0.962			0.980	
Satd. Flow (perm)	1719	1620	0	1719	1665	0	0	1741	1538	0	1773	1538
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	106	250	206	122	139	44	11	44	28	39	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	356	0	206	261	0	0	55	44	0	67	28
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	150	95	225	185	110	125	40	10	40	25	35	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	167	106	250	206	122	139	44	11	44	28	39	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	261			356			1144	1236	231	1092	1292	192
vC1, stage 1 conf vol							564	564		603	603	
vC2, stage 2 conf vol							581	672		489	689	
vCu, unblocked vol	261			356			1144	1236	231	1092	1292	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			83			76	94	94	88	77	97
cM capacity (veh/h)	1286			1187			182	196	801	223	172	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	167	356	206	261	56	44	67	28
Volume Left	167	0	206	0	44	0	28	0
Volume Right	0	250	0	139	0	44	0	28
cSH	1286	1700	1187	1700	185	801	191	842
Volume to Capacity	0.13	0.21	0.17	0.15	0.30	0.06	0.35	0.03
Queue Length 95th (ft)	11	0	16	0	30	4	37	3
Control Delay (s)	8.2	0.0	8.7	0.0	32.6	9.8	33.7	9.4
Lane LOS	A		A		D	A	D	A
Approach Delay (s)	2.6		3.8		22.5		26.6	
Approach LOS					C		D	

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	49.0%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	135	15	105	365	1	20	10	40	5	30	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.985						0.923			0.932	
Flt Protected	0.950			0.950				0.986			0.996	
Satd. Flow (prot)	1719	1782	0	1719	1810	0	0	1647	0	0	1680	0
Flt Permitted	0.950			0.950				0.986			0.996	
Satd. Flow (perm)	1719	1782	0	1719	1810	0	0	1647	0	0	1680	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	150	17	117	406	1	22	11	44	6	33	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	167	0	117	407	0	0	77	0	0	78	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	135	15	105	365	1	20	10	40	5	30	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	150	17	117	406	1	22	11	44	6	33	39
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	412			172			885	831	168	872	838	416
vC1, stage 1 conf vol							186	186		644	644	
vC2, stage 2 conf vol							699	645		227	194	
vCu, unblocked vol	412			172			885	831	168	872	838	416
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			93	97	95	99	92	94
cM capacity (veh/h)	1126			1382			313	392	861	378	394	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	167	117	407	78	78
Volume Left	11	0	117	0	22	6
Volume Right	0	17	0	1	44	39
cSH	1126	1700	1382	1700	515	481
Volume to Capacity	0.01	0.10	0.08	0.24	0.15	0.16
Queue Length 95th (ft)	1	0	7	0	13	14
Control Delay (s)	8.2	0.0	7.8	0.0	13.2	13.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.5		1.7		13.2	13.9
Approach LOS					B	B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	43.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	120	45	25	400	1	45	5	25	20	15	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.959						0.955			0.944	
Flt Protected	0.950			0.950				0.971			0.984	
Satd. Flow (prot)	1719	1735	0	1719	1810	0	0	1678	0	0	1681	0
Flt Permitted	0.950			0.950				0.971			0.984	
Satd. Flow (perm)	1719	1735	0	1719	1810	0	0	1678	0	0	1681	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	133	50	28	444	1	50	6	28	22	17	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	183	0	28	445	0	0	84	0	0	67	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	120	45	25	400	1	45	5	25	20	15	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	133	50	28	444	1	50	6	28	22	17	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			188			738	703	168	708	727	455
vC1, stage 1 conf vol							197	197		506	506	
vC2, stage 2 conf vol							541	506		202	222	
vCu, unblocked vol	451			188			738	703	168	708	727	455
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			88	99	97	95	97	95
cM capacity (veh/h)	1090			1362			429	475	861	486	479	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	183	28	446	83	67
Volume Left	17	0	28	0	50	22
Volume Right	0	50	0	1	28	28
cSH	1090	1700	1362	1700	519	523
Volume to Capacity	0.02	0.11	0.02	0.26	0.16	0.13
Queue Length 95th (ft)	1	0	2	0	14	11
Control Delay (s)	8.4	0.0	7.7	0.0	13.3	12.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.7		0.5		13.3	12.9
Approach LOS					B	B

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	36.3%	ICU Level of Service	A	
Analysis Period (min)	15			

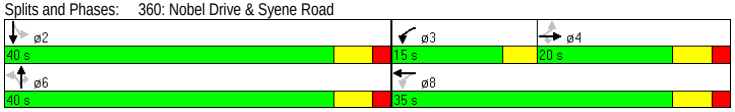
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	100	50	185	235	1	120	515	390	1	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	300		0	150		200	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.97	0.99	1.00		1.00		0.97	1.00	0.99	
Frt			0.850		0.999				0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1808	0	1719	1810	1538	1719	1698	0
Flt Permitted	0.597			0.521			0.639			0.288		
Satd. Flow (perm)	1070	1810	1487	938	1808	0	1151	1810	1499	520	1698	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	111	28	206	261	1	133	572	217	1	122	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	111	28	206	262	0	133	572	217	1	189	0
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Detector Phase	4	4	4	3	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0		15.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	16.0	16.0	16.0	9.5	16.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	20.0	20.0	20.0	15.0	35.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0
Total Split (%)	26.7%	26.7%	26.7%	20.0%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
Maximum Green (s)	14.0	14.0	14.0	11.5	29.0		34.0	34.0	34.0	34.0	34.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	

Volume
360: Nobel Drive & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.14	0.34	0.10	0.43	0.42		0.26	0.71	0.32	0.00	0.25	
Control Delay	28.1	29.7	26.9	17.2	18.8		13.1	19.9	13.3	10.0	12.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	28.1	29.7	26.9	17.2	18.8		13.1	19.9	13.3	10.0	12.3	
90th %ile Green (s)	12.6	12.6	12.6	11.5	27.6		34.0	34.0	34.0	34.0	34.0	
90th %ile Term Code	Gap	Gap	Gap	Max	Hold		Max	Max	Max	Hold	Hold	
70th %ile Green (s)	10.1	10.1	10.1	11.5	25.1		34.0	34.0	34.0	34.0	34.0	
70th %ile Term Code	Gap	Gap	Gap	Max	Hold		Max	Max	Max	Hold	Hold	
50th %ile Green (s)	10.0	10.0	10.0	10.0	23.5		31.1	31.1	31.1	31.1	31.1	
50th %ile Term Code	Min	Min	Min	Gap	Hold		Gap	Gap	Gap	Hold	Hold	
30th %ile Green (s)	10.0	10.0	10.0	7.8	21.3		24.7	24.7	24.7	24.7	24.7	
30th %ile Term Code	Min	Min	Min	Gap	Hold		Gap	Gap	Gap	Hold	Hold	
10th %ile Green (s)	10.0	10.0	10.0	0.0	10.0		15.0	15.0	15.0	15.0	15.0	
10th %ile Term Code	Hold	Hold	Hold	Skip	Min		Min	Min	Min	Min	Min	
Queue Length 50th (ft)	10	42	10	56	79		31	171	52	0	44	
Queue Length 95th (ft)	33	90	32	108	144		70	307	105	3	89	
Internal Link Dist (ft)		1331			1359			1042			304	
Turn Bay Length (ft)	150		150	300			150		200	150		
Base Capacity (vph)	261	440	362	519	911		681	1070	886	307	1004	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.11	0.25	0.08	0.40	0.29		0.20	0.53	0.24	0.00	0.19	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 61.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 73.6	
70th %ile Actuated Cycle: 71.1	
50th %ile Actuated Cycle: 66.6	
30th %ile Actuated Cycle: 58	
10th %ile Actuated Cycle: 37	

Splits and Phases: 360: Nobel Drive & Syene Road



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HCM Signalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	100	50	185	235	1	120	515	390	1	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	1810	1486	1714	1808		1712	1810	1499	1715	1698	
Flt Permitted	0.60	1.00	1.00	0.52	1.00		0.64	1.00	1.00	0.29	1.00	
Satd. Flow (perm)	1071	1810	1486	940	1808		1150	1810	1499	520	1698	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	28	111	28	206	261	1	133	572	217	1	122	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	28	111	28	206	262	0	133	572	217	1	189	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Actuated Green, G (s)	11.1	11.1	11.1	22.0	22.0		27.4	27.4	27.4	27.4	27.4	
Effective Green, g (s)	11.1	11.1	11.1	22.0	22.0		27.4	27.4	27.4	27.4	27.4	
Actuated g/C Ratio	0.18	0.18	0.18	0.36	0.36		0.45	0.45	0.45	0.45	0.45	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	194	327	269	430	648		513	808	669	232	758	
v/s Ratio Prot		0.06		c0.06	0.14			c0.32			0.11	
v/s Ratio Perm	0.03		0.02	c0.11			0.12		0.14	0.00		
v/c Ratio	0.14	0.34	0.10	0.48	0.40		0.26	0.71	0.32	0.00	0.25	
Uniform Delay, d1	21.2	22.0	21.0	14.5	14.8		10.6	13.8	11.0	9.4	10.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.2	0.1	0.3	0.2		0.6	3.6	0.6	0.0	0.4	
Delay (s)	21.3	22.2	21.1	14.8	14.9		11.2	17.3	11.6	9.4	11.0	
Level of Service	C	C	C	B	B		B	B	B	A	B	
Approach Delay (s)		21.8			14.9			15.1			10.9	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
500: Irish Lane & CTH D (Fish Hatchery)

1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	30	225	870	75	55	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	33	250	967	83	61	233
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	250	967	83	61	233
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	225	870	75	55	210
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	250	967	83	61	233
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1216	493			1055	
vC1, stage 1 conf vol	972					
vC2, stage 2 conf vol	244					
vCu, unblocked vol	1216	493			1055	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	51			90	
cM capacity (veh/h)	300	509			635	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	250	483	483	83	61	117	117
Volume Left	33	0	0	0	0	61	0	0
Volume Right	0	250	0	0	83	0	0	0
cSH	300	509	1700	1700	1700	635	1700	1700
Volume to Capacity	0.11	0.49	0.28	0.28	0.05	0.10	0.07	0.07
Queue Length 95th (ft)	9	67	0	0	0	8	0	0
Control Delay (s)	18.5	18.7	0.0	0.0	0.0	11.3	0.0	0.0
Lane LOS	C	C				B		
Approach Delay (s)	18.7		0.0			2.3		
Approach LOS	C							

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	190	1	1	225	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.900	
Flt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Flt Permitted					0.987	
Satd. Flow (perm)	1808	0	0	1810	1607	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	211	1	1	250	6	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	0	0	251	23	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill

1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	190	1	1	225	5	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	1	1	250	6	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		464	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		464	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	98
cM capacity (veh/h)			1340		551	821

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	212	251	22
Volume Left	0	1	6
Volume Right	1	0	17
cSH	1700	1340	731
Volume to Capacity	0.12	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	22.6%	ICU Level of Service		A
Analysis Period (min)	15			

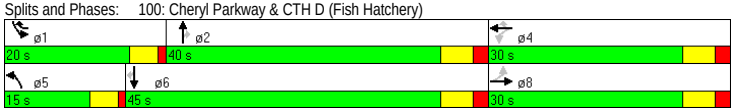
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	700	5	815	15	360	1300	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	1.00		0.98	1.00		0.97
Frt		0.882				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1574	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.739			0.739			0.950			0.950		
Satd. Flow (perm)	1330	1574	0	1330	1810	1514	1714	3438	1514	3321	3438	1499
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	6	22	233	28	389	6	906	8	400	1444	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	28	0	233	28	389	6	906	8	400	1444	53
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	20.0	15.0	40.0	40.0	20.0	45.0	45.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	22.2%	16.7%	44.4%	44.4%	22.2%	50.0%	50.0%
Maximum Green (s)	24.0	24.0		24.0	24.0	15.5	10.5	34.0	34.0	15.5	39.0	39.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.18	0.08		0.82	0.07	0.66	0.04	0.59	0.01	0.76	0.67	0.06
Control Delay	28.4	26.6		56.1	26.3	24.3	25.0	26.3	18.6	46.3	15.2	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	26.6		56.1	26.3	24.3	25.0	26.3	18.6	46.3	15.2	9.7
90th %ile Green (s)	24.0	24.0		24.0	24.0	15.5	8.0	34.0	34.0	15.5	41.5	41.5
90th %ile Term Code	Hold	Hold		Max	Max	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	23.3	23.3		23.3	23.3	16.2	0.0	34.0	34.0	16.2	54.7	54.7
70th %ile Term Code	Hold	Hold		Gap	Gap	Max	Skip	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	20.1	20.1		20.1	20.1	15.0	0.0	38.4	38.4	15.0	57.9	57.9
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	16.7	16.7		16.7	16.7	13.3	0.0	43.5	43.5	13.3	61.3	61.3
30th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	11.8	11.8		11.8	11.8	10.8	0.0	50.9	50.9	10.8	66.2	66.2
10th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	23	13		125	13	155	3	261	3	112	237	10
Queue Length 95th (ft)	51	33		200	33	219	m6	347	m8	160	#542	37
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	355	420		355	483	615	201	1534	676	579	2152	938
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.07		0.66	0.06	0.63	0.03	0.59	0.01	0.69	0.67	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	20	210	25	700	5	815	15	360	1300	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1707	1573		1707	1810	1524	1719	3438	1515	3335	3438	1501
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1328	1573		1328	1810	1524	1719	3438	1515	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	50	6	22	233	28	389	6	906	8	400	1444	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	50	28	0	233	28	389	6	906	8	400	1444	53
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	19.2	19.2		19.2	19.2	33.4	1.6	40.1	40.1	14.2	52.7	52.7
Effective Green, g (s)	19.2	19.2		19.2	19.2	33.4	1.6	40.1	40.1	14.2	52.7	52.7
Actuated g/C Ratio	0.21	0.21		0.21	0.21	0.37	0.02	0.45	0.45	0.16	0.59	0.59
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	283	336		283	386	566	31	1532	675	526	2013	879
v/s Ratio Prot		0.02			0.02	0.11	0.00	0.26		c0.12	c0.42	
v/s Ratio Perm	0.04			c0.18		0.15			0.01			0.04
v/c Ratio	0.18	0.08		0.82	0.07	0.69	0.19	0.59	0.01	0.76	0.72	0.06
Uniform Delay, d1	28.9	28.4		33.8	28.3	23.9	43.6	18.8	13.9	36.3	13.3	8.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.65	1.21	1.07	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0		16.6	0.0	2.8	1.0	1.5	0.0	5.8	2.2	0.1
Delay (s)	29.0	28.4		50.4	28.3	26.7	29.4	24.3	14.9	42.0	15.6	8.1
Level of Service	C	C		D	C	C	C	C	B	D	B	A
Approach Delay (s)		28.8			35.2			24.2			20.9	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	24.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1490	210	75	435	0	0	0	0	375	1	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4940	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.091						0.950	0.953	
Satd. Flow (perm)	0	4940	1538	165	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1656	117	83	483	0	0	0	0	417	1	592
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1656	117	83	483	0	0	0	0	208	210	592
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	10.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	16.0
Total Split (s)	0.0	43.0	43.0	12.0	55.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	68.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	31.3%
Maximum Green (s)		37.0	37.0	8.5	49.0					19.0	19.0	19.0
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

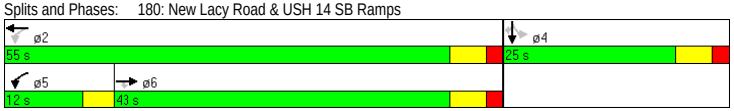
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.65	0.15	0.36	0.23					0.54	0.55	0.93
Control Delay		16.3	11.9	7.6	3.3					32.9	33.0	54.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		16.3	11.9	7.6	3.3					32.9	33.0	54.5
90th %ile Green (s)		38.1	38.1	7.4	49.0					19.0	19.0	19.0
90th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
70th %ile Green (s)		39.0	39.0	6.5	49.0					19.0	19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
50th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
30th %ile Green (s)		39.5	39.5	6.0	49.0					19.0	19.0	19.0
30th %ile Term Code		Coord	Coord	Min	Coord					Max	Max	Max
10th %ile Green (s)		50.4	50.4	0.0	50.4					17.6	17.6	17.6
10th %ile Term Code		Coord	Coord	Skip	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		218	30	5	26					95	96	164
Queue Length 95th (ft)		280	61	10	21					166	168	#271
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		2550	794	272	2118					388	389	643
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.65	0.15	0.31	0.23					0.54	0.54	0.92

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1490	210	75	435	0	0	0	0	375	1	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4940	1538	1719	3438					1633	1638	2707
Flt Permitted		1.00	1.00	0.09	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4940	1538	164	3438					1633	1638	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1656	117	83	483	0	0	0	0	417	1	592
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1656	117	83	483	0	0	0	0	208	210	592
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Actuated Green, G (s)		40.6	40.6	49.3	49.3					18.7	18.7	18.7
Effective Green, g (s)		40.6	40.6	49.3	49.3					18.7	18.7	18.7
Actuated g/C Ratio		0.51	0.51	0.62	0.62					0.23	0.23	0.23
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	6.0
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		2507	781	202	2119					382	383	633
v/s Ratio Prot		c0.34		c0.03	0.14							
v/s Ratio Perm			0.08	0.23						0.13	0.13	c0.22
v/c Ratio		0.66	0.15	0.41	0.23					0.54	0.55	0.94
Uniform Delay, d1		14.6	10.5	9.0	6.9					26.9	26.9	30.1
Progression Factor		1.00	1.00	0.69	0.44					1.00	1.00	1.00
Incremental Delay, d2		1.4	0.4	0.4	0.2					0.9	0.9	20.9
Delay (s)		16.0	10.9	6.6	3.2					27.8	27.8	51.0
Level of Service		B	B	A	A					C	C	D
Approach Delay (s)		15.6			3.7			0.0			41.4	
Approach LOS		B			A			A			D	

Intersection Summary

HCM Average Control Delay	21.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		15.5	
Intersection Capacity Utilization	66.0%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1070	795	0	0	345	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1189	883	0	0	383	183	183	1	50	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1189	883	0	0	383	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

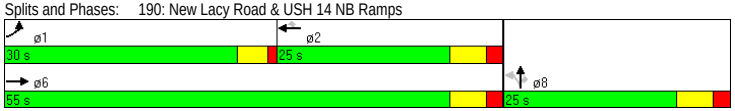
Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.87	0.38			0.52	0.55		0.64	0.19			
Control Delay	16.8	2.3			30.1	34.5		41.0	29.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	16.8	2.3			30.1	34.5		41.0	29.1			
90th %ile Green (s)	26.4	49.9			19.0	19.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	29.4	52.9			19.0	19.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	32.4	55.1			18.2	18.2	12.9	12.9	12.9			
50th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	37.6	57.3			15.2	15.2	10.7	10.7	10.7			
30th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	38.5	58.0			15.0	15.0	10.0	10.0	10.0			
10th %ile Term Code	Max	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	275	7			87	81		87	22			
Queue Length 95th (ft)	#474	51			128	142		142	48			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1370	2348			817	365		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.87	0.38			0.47	0.50		0.45	0.14			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1070	795	0	0	345	330	165	1	90	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1189	883	0	0	383	183	183	1	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1189	883	0	0	383	183	0	184	50	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	32.9	54.6			17.2	17.2		13.4	13.4			
Effective Green, g (s)	32.9	54.6			17.2	17.2		13.4	13.4			
Actuated g/C Ratio	0.41	0.68			0.21	0.21		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1372	2346			739	331		289	258			
v/s Ratio Prot	c0.36	0.26			0.11							
v/s Ratio Perm						c0.12		0.11	0.03			
v/c Ratio	0.87	0.38			0.52	0.55		0.64	0.19			
Uniform Delay, d1	21.5	5.4			27.7	28.0		31.0	28.7			
Progression Factor	0.31	0.32			1.00	1.00		1.00	1.00			
Incremental Delay, d2	4.5	0.4			2.6	6.5		3.4	0.1			
Delay (s)	11.1	2.1			30.3	34.5		34.4	28.8			
Level of Service	B	A			C	C		C	C			
Approach Delay (s)		7.3			31.7			33.2			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	165	120	120	305	235	195	520	50	335	860	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		150	155		200	200		175	200		150
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	0.99		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.219			0.642			0.197			0.295		
Satd. Flow (perm)	396	1810	1514	1155	1810	1509	356	3438	1493	533	3438	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	128	183	67	133	339	131	217	578	28	372	956	203
Shared Lane Traffic (%)												
Lane Group Flow (vph)	128	183	67	133	339	131	217	578	28	372	956	203
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Detector Phase	3	8	8	4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0	16.0	16.0	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	15.0	40.0	40.0	25.0	25.0	25.0	12.0	30.0	30.0	20.0	38.0	38.0
Total Split (%)	16.7%	44.4%	44.4%	27.8%	27.8%	27.8%	13.3%	33.3%	33.3%	22.2%	42.2%	42.2%
Maximum Green (s)	11.5	34.0	34.0	19.0	19.0	19.0	8.5	24.0	24.0	16.5	32.0	32.0
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	8.0	8.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

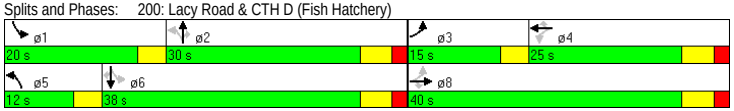
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0	10.0	10.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0	10.0	10.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.46	0.29	0.13	0.53	0.87	0.40	0.76	0.54	0.06	0.77	0.73	0.36
Control Delay	23.4	21.7	19.3	40.0	57.9	34.4	33.8	28.5	24.9	21.8	22.1	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	21.7	19.3	40.0	57.9	34.4	33.8	28.5	24.9	21.8	22.1	16.3
90th %ile Green (s)	11.5	34.0	34.0	19.0	19.0	19.0	8.5	24.0	24.0	16.5	32.0	32.0
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	10.2	34.0	34.0	20.3	20.3	20.3	8.5	24.0	24.0	16.5	32.0	32.0
70th %ile Term Code	Gap	Hold	Hold	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	8.8	34.0	34.0	21.7	21.7	21.7	8.5	24.0	24.0	16.5	32.0	32.0
50th %ile Term Code	Gap	Hold	Hold	Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	7.6	31.1	31.1	20.0	20.0	20.0	10.2	29.2	29.2	14.2	33.2	33.2
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	6.0	25.3	25.3	15.8	15.8	15.8	7.9	38.9	38.9	10.3	41.3	41.3
10th %ile Term Code	Min	Hold	Hold	Gap	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	46	71	24	65	180	62	65	124	11	104	264	92
Queue Length 95th (ft)	84	121	52	128	#343	119	#177	205	m31	#201	217	m67
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	300		150	155		200	200		175	200		150
Base Capacity (vph)	320	684	572	257	402	335	289	1070	465	507	1302	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.27	0.12	0.52	0.84	0.39	0.75	0.54	0.06	0.73	0.73	0.36

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	165	120	120	305	235	195	520	50	335	860	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1810	1513	1710	1810	1509	1719	3438	1495	1718	3438	1497
Flt Permitted	0.22	1.00	1.00	0.64	1.00	1.00	0.20	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	397	1810	1513	1156	1810	1509	356	3438	1495	533	3438	1497
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	128	183	67	133	339	131	217	578	28	372	956	203
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	128	183	67	133	339	131	217	578	28	372	956	203
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	31.7	31.7	31.7	19.4	19.4	19.4	36.7	28.0	28.0	46.3	34.1	34.1
Effective Green, g (s)	31.7	31.7	31.7	19.4	19.4	19.4	36.7	28.0	28.0	46.3	34.1	34.1
Actuated g/C Ratio	0.35	0.35	0.35	0.22	0.22	0.22	0.41	0.31	0.31	0.51	0.38	0.38
Clearance Time (s)	3.5	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	8.0	8.0	2.0	5.0	5.0
Lane Grp Cap (vph)	269	638	533	249	390	325	277	1070	465	469	1303	567
v/s Ratio Prot	c0.05	0.10			c0.19		0.08	0.17		c0.13	0.28	
v/s Ratio Perm	0.12		0.04	0.12		0.09	0.24		0.02	c0.28		0.14
v/c Ratio	0.48	0.29	0.13	0.53	0.87	0.40	0.78	0.54	0.06	0.79	0.73	0.36
Uniform Delay, d1	21.6	21.0	19.8	31.3	34.1	30.3	18.9	25.7	21.8	14.6	24.0	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.97	1.00	0.95	0.77	0.70
Incremental Delay, d2	0.5	0.1	0.0	1.1	17.7	0.3	12.2	1.9	0.2	6.4	2.8	1.3
Delay (s)	22.1	21.1	19.8	32.4	51.7	30.6	31.5	26.9	21.9	20.3	21.3	15.3
Level of Service	C	C	B	C	D	C	C	C	C	C	C	B
Approach Delay (s)		21.2			42.9			28.0			20.3	
Approach LOS		C			D			C			C	

Intersection Summary

HCM Average Control Delay	26.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.74				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	310	50	190	290	40	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.912	
Flt Protected			0.950		0.983	
Satd. Flow (prot)	1810	1538	1719	1810	1622	0
Flt Permitted			0.950		0.983	
Satd. Flow (perm)	1810	1538	1719	1810	1622	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	344	56	211	322	44	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	56	211	322	127	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	310	50	190	290	40	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	344	56	211	322	44	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			400		1089	344
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			400		1089	344
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		77	88
cM capacity (veh/h)			1143		192	692

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	344	56	211	322	128
Volume Left	0	0	211	0	44
Volume Right	0	56	0	0	83
cSH	1700	1700	1143	1700	363
Volume to Capacity	0.20	0.03	0.18	0.19	0.35
Queue Length 95th (ft)	0	0	17	0	39
Control Delay (s)	0.0	0.0	8.9	0.0	20.2
Lane LOS			A		C
Approach Delay (s)	0.0		3.5		20.2
Approach LOS					C

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		43.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	450	5	15	435	1	5	1	10	1	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.917			0.886	
Flt Protected	0.950			0.950				0.984			0.996	
Satd. Flow (prot)	1719	1810	1538	1719	1810	0	0	1633	0	0	1597	0
Flt Permitted	0.950			0.950				0.984			0.996	
Satd. Flow (perm)	1719	1810	1538	1719	1810	0	0	1633	0	0	1597	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	500	6	17	483	1	6	1	11	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	500	6	17	484	0	0	18	0	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	450	5	15	435	1	5	1	10	1	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	500	6	17	483	1	6	1	11	1	1	11
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	484			511			1061	1045	510	1056	1050	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			511			1061	1045	510	1056	1050	489
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			97	99	98	99	99	98
cM capacity (veh/h)	1063			1035			188	219	553	190	218	571

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	11	500	6	17	484	18	13
Volume Left	11	0	0	17	0	6	1
Volume Right	0	0	6	0	1	11	11
cSH	1063	1700	1700	1035	1700	325	438
Volume to Capacity	0.01	0.29	0.00	0.02	0.28	0.05	0.03
Queue Length 95th (ft)	1	0	0	1	0	4	2
Control Delay (s)	8.4	0.0	0.0	8.5	0.0	16.7	13.5
Lane LOS	A			A		C	B
Approach Delay (s)	0.2			0.3		16.7	13.5
Approach LOS						C	B

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	35.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	475	20	55	410	15	30	1	55	25	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		125	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994				0.850		0.913			0.963	
Flt Protected	0.950			0.950				0.983			0.966	
Satd. Flow (prot)	1719	1799	0	1719	1810	1538	0	1624	0	0	1683	0
Flt Permitted	0.950			0.950				0.983			0.966	
Satd. Flow (perm)	1719	1799	0	1719	1810	1538	0	1624	0	0	1683	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	528	22	61	456	17	33	1	61	28	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	550	0	61	456	17	0	95	0	0	40	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	475	20	55	410	15	30	1	55	25	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	528	22	61	456	17	33	1	61	28	1	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					991							
pX, platoon unblocked												
vC, conflicting volume	472			550			1151	1156	539	1189	1150	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472			550			1151	1156	539	1189	1150	456
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			79	99	89	79	99	98
cM capacity (veh/h)	1074			1005			160	180	537	135	182	599

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	11	550	61	456	17	96	40
Volume Left	11	0	61	0	0	33	28
Volume Right	0	22	0	0	17	61	11
cSH	1074	1700	1005	1700	1700	291	174
Volume to Capacity	0.01	0.32	0.06	0.27	0.01	0.33	0.23
Queue Length 95th (ft)	1	0	5	0	0	35	21
Control Delay (s)	8.4	0.0	8.8	0.0	0.0	23.3	31.7
Lane LOS	A		A			C	D
Approach Delay (s)	0.2		1.0			23.3	31.7
Approach LOS						C	D

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	44.6%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	450	40	55	310	40	25	125	20	70	395	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00		0.97	0.99		0.97
Frt		0.988			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1784	0	1719	1774	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.490			0.332			0.349			0.668		
Satd. Flow (perm)	884	1784	0	599	1774	0	629	1810	1497	1202	1810	1497
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	72	500	44	61	344	44	28	139	11	78	439	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	544	0	61	388	0	28	139	11	78	439	81
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.0	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	33.0	33.0	0.0	33.0	33.0	0.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	0.0%	55.0%	55.0%	0.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Maximum Green (s)	27.0	27.0		27.0	27.0		21.0	21.0	21.0	21.0	21.0	21.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

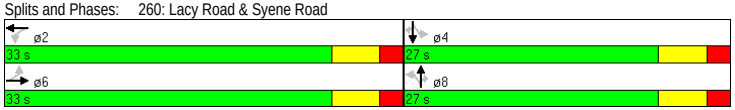
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.19	0.69		0.23	0.50		0.14	0.24	0.02	0.20	0.76	0.17
Control Delay	11.1	17.8		12.7	13.6		15.4	14.9	13.0	15.1	26.2	14.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	17.8		12.7	13.6		15.4	14.9	13.0	15.1	26.2	14.4
90th %ile Green (s)	27.0	27.0		27.0	27.0		21.0	21.0	21.0	21.0	21.0	21.0
90th %ile Term Code	Max	Max		Max	Max		Hold	Hold	Hold	Max	Max	Max
70th %ile Green (s)	27.0	27.0		27.0	27.0		21.0	21.0	21.0	21.0	21.0	21.0
70th %ile Term Code	Max	Max		Hold	Hold		Hold	Hold	Hold	Max	Max	Max
50th %ile Green (s)	24.7	24.7		24.7	24.7		17.6	17.6	17.6	17.6	17.6	17.6
50th %ile Term Code	Gap	Gap		Hold	Hold		Hold	Hold	Hold	Gap	Gap	Gap
30th %ile Green (s)	19.3	19.3		19.3	19.3		13.3	13.3	13.3	13.3	13.3	13.3
30th %ile Term Code	Gap	Gap		Hold	Hold		Hold	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	15.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
10th %ile Term Code	Min	Min		Min	Min		Hold	Hold	Hold	Min	Min	Min
Queue Length 50th (ft)	13	128		11	82		6	32	2	18	124	18
Queue Length 95th (ft)	37	247		36	160		23	70	11	46	#226	46
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	483	975		328	969		267	769	636	511	769	636
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.56		0.19	0.40		0.10	0.18	0.02	0.15	0.57	0.13

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.2
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 60
70th %ile Actuated Cycle: 60
50th %ile Actuated Cycle: 54.3
30th %ile Actuated Cycle: 44.6
10th %ile Actuated Cycle: 37
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	450	40	55	310	40	25	125	20	70	395	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1714	1784		1715	1774		1713	1810	1496	1708	1810	1496
Flt Permitted	0.49	1.00		0.33	1.00		0.35	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	884	1784		600	1774		630	1810	1496	1201	1810	1496
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	72	500	44	61	344	44	28	139	11	78	439	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	72	544	0	61	388	0	28	139	11	78	439	81
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	22.4	22.4		22.4	22.4		16.3	16.3	16.3	16.3	16.3	16.3
Effective Green, g (s)	22.4	22.4		22.4	22.4		16.3	16.3	16.3	16.3	16.3	16.3
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.32	0.32	0.32	0.32	0.32	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	391	788		265	784		203	582	481	386	582	481
v/s Ratio Prot		c0.30			0.22			0.08			c0.24	
v/s Ratio Perm	0.08			0.10			0.04		0.01	0.06		0.05
v/c Ratio	0.18	0.69		0.23	0.49		0.14	0.24	0.02	0.20	0.75	0.17
Uniform Delay, d1	8.6	11.4		8.8	10.1		12.2	12.6	11.8	12.5	15.4	12.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	3.3		0.9	1.0		0.1	0.1	0.0	0.1	4.9	0.1
Delay (s)	9.1	14.7		9.7	11.1		12.3	12.7	11.8	12.6	20.3	12.4
Level of Service	A	B		A	B		B	B	B	B	C	B
Approach Delay (s)		14.0			10.9			12.6			18.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	14.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	50.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	5	275	5	455	5	335	100	150	1075	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		200	150		200	500		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00	0.98		0.99	0.98	1.00		0.97	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.953		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1724	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.682			0.713		0.222			0.489		
Satd. Flow (perm)	0	1230	1511	0	1283	1511	401	3438	1499	883	3438	1501
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	3	306	6	253	6	372	56	167	1194	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	3	0	312	253	6	372	56	167	1194	25
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	21.0	21.0	21.0	9.5	21.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	48.0	48.0	48.0	12.0	60.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	53.3%	53.3%	53.3%	13.3%	66.7%	66.7%
Maximum Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	42.0	42.0	42.0	8.5	54.0	54.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

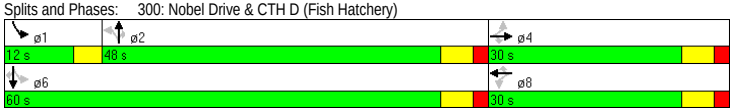
Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.07	0.01		0.88	0.60	0.03	0.23	0.08	0.27	0.59	0.03
Control Delay		24.3	23.7		57.2	34.9	14.6	15.5	14.8	4.5	5.9	4.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		24.3	23.7		57.2	34.9	14.6	15.5	14.8	4.5	5.9	4.0
90th %ile Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	42.0	42.0	42.0	8.5	54.0	54.0
90th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	26.6	26.6	26.6	26.6	26.6	26.6	39.4	39.4	39.4	8.5	51.4	51.4
70th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	28.7	28.7	28.7	28.7	28.7	28.7	37.2	37.2	37.2	8.6	49.3	49.3
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	25.6	25.6	25.6	25.6	25.6	25.6	41.7	41.7	41.7	7.2	52.4	52.4
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	20.1	20.1	20.1	20.1	20.1	20.1	48.4	48.4	48.4	6.0	57.9	57.9
10th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Min	Coord	Coord
Queue Length 50th (ft)		9	1		158	117	2	71	19	21	87	3
Queue Length 95th (ft)		29	8		#329	209	9	93	38	m25	86	m5
Internal Link Dist (ft)		186			710			1314			1278	
Turn Bay Length (ft)						200	150		200	500		100
Base Capacity (vph)		352	433		367	433	193	1653	721	624	2093	914
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.07	0.01		0.85	0.58	0.03	0.23	0.08	0.27	0.57	0.03

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Nobel Drive & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	5	275	5	455	5	335	100	150	1075	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1722	1511		1716	1511	1717	3438	1499	1717	3438	1501
Flt Permitted		0.68	1.00		0.71	1.00	0.22	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1230	1511		1284	1511	401	3438	1499	885	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	22	1	3	306	6	253	6	372	56	167	1194	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	23	3	0	312	253	6	372	56	167	1194	25
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		25.0	25.0		25.0	25.0	41.7	41.7	41.7	53.0	53.0	53.0
Effective Green, g (s)		25.0	25.0		25.0	25.0	41.7	41.7	41.7	53.0	53.0	53.0
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.46	0.46	0.46	0.59	0.59	0.59
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		342	420		357	420	186	1593	695	593	2025	884
v/s Ratio Prot								0.11		0.02	c0.35	
v/s Ratio Perm		0.02	0.00		c0.24	0.17	0.01		0.04	0.14		0.02
v/c Ratio		0.07	0.01		0.87	0.60	0.03	0.23	0.08	0.28	0.59	0.03
Uniform Delay, d1		23.9	23.5		31.0	28.2	13.2	14.5	13.5	8.5	11.7	7.7
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.46	0.40	0.48
Incremental Delay, d2		0.0	0.0		19.8	1.7	0.3	0.3	0.2	0.1	1.1	0.0
Delay (s)		23.9	23.5		50.8	29.9	13.5	14.9	13.7	4.0	5.7	3.8
Level of Service		C	C		D	C	B	B	B	A	A	A
Approach Delay (s)		23.9			41.4			14.7			5.5	
Approach LOS		C			D			B			A	

Intersection Summary

HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
310: Nobel Drive & Research Park Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	170	45	1	535	10	165	10	10	10	5	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.969			0.997			0.993			0.894	
Flt Protected	0.950			0.950				0.957			0.993	
Satd. Flow (prot)	1719	1753	0	1719	1804	0	0	1720	0	0	1606	0
Flt Permitted	0.950			0.950				0.957			0.993	
Satd. Flow (perm)	1719	1753	0	1719	1804	0	0	1720	0	0	1606	0
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		790			981			640			491	
Travel Time (s)		15.4			19.1			14.5			11.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	189	50	1	594	11	183	11	11	11	6	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	239	0	1	605	0	0	205	0	0	78	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
310: Nobel Drive & Research Park Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	170	45	1	535	10	165	10	10	10	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	189	50	1	594	11	183	11	11	11	6	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)		790										
pX, platoon unblocked												
vC, conflicting volume	611			244			879	887	224	873	907	610
vC1, stage 1 conf vol							274	274		607	607	
vC2, stage 2 conf vol							604	613		266	299	
vCu, unblocked vol	611			244			879	887	224	873	907	610
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			49	97	99	97	99	87
cM capacity (veh/h)	950			1300			363	415	801	431	431	485

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	28	239	1	606	206	78
Volume Left	28	0	1	0	183	11
Volume Right	0	50	0	11	11	61
cSH	950	1700	1300	1700	376	472
Volume to Capacity	0.03	0.14	0.00	0.36	0.55	0.16
Queue Length 95th (ft)	2	0	0	0	79	15
Control Delay (s)	8.9	0.0	7.8	0.0	25.5	14.1
Lane LOS	A		A		D	B
Approach Delay (s)	0.9		0.0		25.5	14.1
Approach LOS					D	B

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
320: Nobel Drive & Mica Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	85	50	50	80	40	190	30	145	100	10	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.944			0.950				0.850			0.850
Flt Protected	0.950			0.950				0.959			0.956	
Satd. Flow (prot)	1719	1708	0	1719	1719	0	0	1735	1538	0	1730	1538
Flt Permitted	0.950			0.950				0.959			0.956	
Satd. Flow (perm)	1719	1708	0	1719	1719	0	0	1735	1538	0	1730	1538
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	94	56	56	89	44	211	33	161	111	11	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	150	0	56	133	0	0	244	161	0	122	139
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	85	50	50	80	40	190	30	145	100	10	125
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	94	56	56	89	44	211	33	161	111	11	139
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			150			544	444	122	572	450	111
vC1, stage 1 conf vol							200	200		222	222	
vC2, stage 2 conf vol							344	244		350	228	
vCu, unblocked vol	133			150			544	444	122	572	450	111
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			55	94	83	74	98	85
cM capacity (veh/h)	1433			1413			473	583	921	430	579	934

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	39	150	56	133	244	161	122	139
Volume Left	39	0	56	0	211	0	111	0
Volume Right	0	56	0	44	0	161	0	139
cSH	1433	1700	1413	1700	486	921	441	934
Volume to Capacity	0.03	0.09	0.04	0.08	0.50	0.17	0.28	0.15
Queue Length 95th (ft)	2	0	3	0	70	16	28	13
Control Delay (s)	7.6	0.0	7.7	0.0	19.7	9.7	16.3	9.5
Lane LOS	A		A		C	A	C	A
Approach Delay (s)	1.6		2.3		15.7		12.7	
Approach LOS					C		B	

Intersection Summary				
Average Delay	10.0			
Intersection Capacity Utilization	39.6%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
330: Nobel Drive & Fahey Glen 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	280	15	40	145	5	10	25	100	5	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.995			0.900			0.932	
Flt Protected	0.950			0.950				0.996			0.991	
Satd. Flow (prot)	1719	1795	0	1719	1800	0	0	1622	0	0	1671	0
Flt Permitted	0.950			0.950				0.996			0.991	
Satd. Flow (perm)	1719	1795	0	1719	1800	0	0	1622	0	0	1671	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	311	17	44	161	6	11	28	111	6	11	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	328	0	44	167	0	0	150	0	0	34	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	280	15	40	145	5	10	25	100	5	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	311	17	44	161	6	11	28	111	6	11	17
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	172			333			679	663	329	777	668	174
vC1, stage 1 conf vol							402	402		258	258	
vC2, stage 2 conf vol							277	261		519	411	
vCu, unblocked vol	172			333			679	663	329	777	668	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			98	94	84	98	98	98
cM capacity (veh/h)	1382			1205			505	502	699	353	484	855

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	39	328	44	167	150	33
Volume Left	39	0	44	0	11	6
Volume Right	0	17	0	6	111	17
cSH	1382	1700	1205	1700	635	573
Volume to Capacity	0.03	0.19	0.04	0.10	0.24	0.06
Queue Length 95th (ft)	2	0	3	0	23	5
Control Delay (s)	7.7	0.0	8.1	0.0	12.4	11.7
Lane LOS	A		A		B	B
Approach Delay (s)	0.8		1.7		12.4	11.7
Approach LOS					B	B

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	335	30	20	135	25	35	5	25	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.976			0.948			0.924	
Flt Protected	0.950			0.950				0.974			0.986	
Satd. Flow (prot)	1719	1788	0	1719	1766	0	0	1671	0	0	1649	0
Flt Permitted	0.950			0.950				0.974			0.986	
Satd. Flow (perm)	1719	1788	0	1719	1766	0	0	1671	0	0	1649	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	372	33	22	150	28	39	6	28	11	6	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	405	0	22	178	0	0	73	0	0	39	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	335	30	20	135	25	35	5	25	10	5	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	372	33	22	150	28	39	6	28	11	6	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	183			411			663	666	399	666	668	174
vC1, stage 1 conf vol							438	438		213	213	
vC2, stage 2 conf vol							224	227		452	455	
vCu, unblocked vol	183			411			663	666	399	666	668	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			92	99	96	98	99	97
cM capacity (veh/h)	1369			1128			518	508	639	485	494	855

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	406	22	178	72	39
Volume Left	22	0	22	0	39	11
Volume Right	0	33	0	28	28	22
cSH	1369	1700	1128	1700	558	646
Volume to Capacity	0.02	0.24	0.02	0.10	0.13	0.06
Queue Length 95th (ft)	1	0	2	0	11	5
Control Delay (s)	7.7	0.0	8.3	0.0	12.4	10.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.9		12.4	10.9
Approach LOS					B	B

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	205	100	300	110	1	50	115	70	1	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	300		0	150		200	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.97	1.00	1.00		1.00		0.97	1.00	1.00	
Frt			0.850		0.999				0.850		0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1807	0	1719	1810	1538	1719	1793	0
Flt Permitted	0.678			0.416			0.264			0.675		
Satd. Flow (perm)	1213	1810	1487	750	1807	0	477	1810	1499	1216	1793	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	61	228	56	333	122	1	56	128	39	1	528	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	228	56	333	123	0	56	128	39	1	556	0
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Detector Phase	4	4	4	3	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0		15.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	16.0	16.0	16.0	9.5	16.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	20.0	20.0	20.0	15.0	35.0	0.0	40.0	40.0	40.0	40.0	40.0	0.0
Total Split (%)	26.7%	26.7%	26.7%	20.0%	46.7%	0.0%	53.3%	53.3%	53.3%	53.3%	53.3%	0.0%
Maximum Green (s)	14.0	14.0	14.0	11.5	29.0		34.0	34.0	34.0	34.0	34.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	

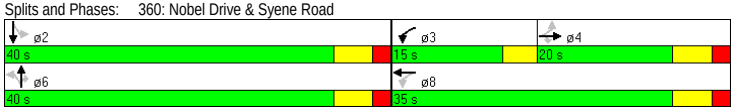
Volume
360: Nobel Drive & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.27	0.67	0.20	0.68	0.17		0.29	0.17	0.06	0.00	0.76	
Control Delay	28.9	38.0	27.2	22.9	15.0		17.7	13.0	12.0	11.0	24.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	28.9	38.0	27.2	22.9	15.0		17.7	13.0	12.0	11.0	24.5	
90th %ile Green (s)	14.0	14.0	14.0	11.5	29.0		34.0	34.0	34.0	34.0	34.0	
90th %ile Term Code	Max	Max	Max	Max	Hold		Hold	Hold	Hold	Max	Max	
70th %ile Green (s)	14.0	14.0	14.0	11.5	29.0		34.0	34.0	34.0	34.0	34.0	
70th %ile Term Code	Max	Max	Max	Max	Hold		Hold	Hold	Hold	Max	Max	
50th %ile Green (s)	13.2	13.2	13.2	11.5	28.2		29.0	29.0	29.0	29.0	29.0	
50th %ile Term Code	Gap	Gap	Gap	Max	Hold		Hold	Hold	Hold	Gap	Gap	
30th %ile Green (s)	10.3	10.3	10.3	10.9	24.7		22.8	22.8	22.8	22.8	22.8	
30th %ile Term Code	Gap	Gap	Gap	Gap	Hold		Hold	Hold	Hold	Gap	Gap	
10th %ile Green (s)	10.0	10.0	10.0	7.8	21.3		16.1	16.1	16.1	16.1	16.1	
10th %ile Term Code	Min	Min	Min	Gap	Hold		Hold	Hold	Hold	Gap	Gap	
Queue Length 50th (ft)	22	91	20	93	32		15	33	10	0	191	
Queue Length 95th (ft)	58	#189	53	#192	71		42	64	26	3	309	
Internal Link Dist (ft)		1331			1359			1042			304	
Turn Bay Length (ft)	150		150	300			150		200	150		
Base Capacity (vph)	265	396	326	508	819		253	962	797	646	953	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.23	0.58	0.17	0.66	0.15		0.22	0.13	0.05	0.00	0.58	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 65.6
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 75
50th %ile Actuated Cycle: 69.2
30th %ile Actuated Cycle: 59.5
10th %ile Actuated Cycle: 49.4
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 360: Nobel Drive & Syene Road



C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Analysis\4. 2025 Build\IMP\PM.syn Synchro 7 - Report
Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	205	100	300	110	1	50	115	70	1	475	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1700	1810	1487	1716	1807		1715	1810	1498	1710	1794	
Flt Permitted	0.68	1.00	1.00	0.42	1.00		0.26	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	1213	1810	1487	751	1807		476	1810	1498	1215	1794	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	61	228	56	333	122	1	56	128	39	1	528	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	61	228	56	333	123	0	56	128	39	1	556	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Actuated Green, G (s)	12.4	12.4	12.4	26.6	26.6		26.7	26.7	26.7	26.7	26.7	
Effective Green, g (s)	12.4	12.4	12.4	26.6	26.6		26.7	26.7	26.7	26.7	26.7	
Actuated g/C Ratio	0.19	0.19	0.19	0.41	0.41		0.41	0.41	0.41	0.41	0.41	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	230	344	282	464	736		195	740	613	497	734	
v/s Ratio Prot		0.13		c0.12	0.07			0.07			c0.31	
v/s Ratio Perm	0.05		0.04	c0.17			0.12		0.03	0.00		
v/c Ratio	0.27	0.66	0.20	0.72	0.17		0.29	0.17	0.06	0.00	0.76	
Uniform Delay, d1	22.6	24.5	22.3	14.5	12.3		12.9	12.3	11.7	11.4	16.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	3.7	0.1	4.4	0.0		1.7	0.2	0.1	0.0	5.3	
Delay (s)	22.8	28.2	22.4	18.9	12.3		14.6	12.5	11.8	11.4	21.9	
Level of Service	C	C	C	B	B		B	B	B	B	C	
Approach Delay (s)		26.3			17.1			12.9			21.8	
Approach LOS		C			B			B			C	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
500: Irish Lane & CTH D (Fish Hatchery)

1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	75	80	285	35	225	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1538	3438	1538	1719	3438
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	83	89	317	39	250	1028
Shared Lane Traffic (%)						
Lane Group Flow (vph)	83	89	317	39	250	1028
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	80	285	35	225	925
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	89	317	39	250	1028
Pedestrians	5		5			5
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			Raised			Raised
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1341	168			361	
vC1, stage 1 conf vol	322					
vC2, stage 2 conf vol	1019					
vCu, unblocked vol	1341	168			361	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	63	89			79	
cM capacity (veh/h)	227	830			1169	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	83	89	158	158	39	250	514	514
Volume Left	83	0	0	0	0	250	0	0
Volume Right	0	89	0	0	39	0	0	0
cSH	227	830	1700	1700	1700	1169	1700	1700
Volume to Capacity	0.37	0.11	0.09	0.09	0.02	0.21	0.30	0.30
Queue Length 95th (ft)	40	9	0	0	0	20	0	0
Control Delay (s)	29.8	9.9	0.0	0.0	0.0	8.9	0.0	0.0
Lane LOS	D	A				A		
Approach Delay (s)	19.5		0.0			1.7		
Approach LOS	C							

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	195	5	20	195	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.884	
Flt Protected				0.995	0.993	
Satd. Flow (prot)	1802	0	0	1800	1588	0
Flt Permitted				0.995	0.993	
Satd. Flow (perm)	1802	0	0	1800	1588	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	217	6	22	217	1	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	239	7	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill

1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	195	5	20	195	1	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	217	6	22	217	1	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			222		481	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			222		481	219
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1329		530	813

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	222	239	7
Volume Left	0	22	1
Volume Right	6	0	6
cSH	1700	1329	746
Volume to Capacity	0.13	0.02	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.9	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.9
Approach LOS			A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	35.3%	ICU Level of Service		A
Analysis Period (min)	15			

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - LACY/FAHEY GLEN                   14  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB LACY  *1.05*   20  335    1  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   50    5   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*    1  370   60  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    5   30   15  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     356     75    431     50           * AVEDEL  s   5.8 *
* CAPACITY    veh     968    830   1012    775           * LOS   SIG     A *
* AVE DELAY  mins    0.10   0.08   0.10   0.08           * LOS UNSIG     A *
* MAX DELAY  mins    0.13   0.10   0.14   0.11           *                  *
* AVE QUEUE   veh       1      0      1      0           * VEHIC HRS   1.5 *
* MAX QUEUE   veh       1      0      1      0           * COST    $    22 *
*                                                        *                  *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - LACY/FAHEY GLEN                   15  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB LACY  *1.05*   20  415    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   45   25   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   20  385   45  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    1    5    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     440     90    450     11           * AVEDEL  s   6.3 *
* CAPACITY    veh     996    789    999    775           * LOS   SIG     A *
* AVE DELAY  mins    0.11   0.08   0.11   0.08           * LOS UNSIG     A *
* MAX DELAY  mins    0.14   0.11   0.15   0.10           *                  *
* AVE QUEUE   veh       1      0      1      0           * VEHIC HRS   1.7 *
* MAX QUEUE   veh       1      0      1      0           * COST    $    26 *
*                                                        *                  *
*****************************************************************************
```

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*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - LACY/FAHEY GLEN                   16  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB LACY  *1.05*   20  335    1  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   50    5   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*    1  370   60  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    5   30   15  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     356     75    431     50           * AVEDEL  s   4.4 *
* CAPACITY    veh    1165   1028   1209    972           * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.06   0.08   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.08   0.10   0.08           *                  *
* AVE QUEUE   veh       0      0      1      0           * VEHIC HRS   1.1 *
* MAX QUEUE   veh       1      0      1      0           * COST    $    17 *
*                                                        *                  *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - LACY/FAHEY GLEN                   17  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                           *    *  *               *         *
* EB LACY  *1.05*   20  415    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   45   25   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   20  385   45  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    1    5    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*          *    *                           *    *  *               *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     440     90    450     11           * AVEDEL  s   4.6 *
* CAPACITY    veh    1193    986   1196    972           * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.07   0.08   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.08   0.10   0.08           *                  *
* AVE QUEUE   veh       1      0      1      0           * VEHIC HRS   1.3 *
* MAX QUEUE   veh       1      0      1      0           * COST    $    19 *
*                                                        *                  *
*****************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - CHERYL/SYENE                 13  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.31   4.27   7.92   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB CHERYL*1.05*    5  140   75  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  235  270   30  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  140  555   55  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  325  145   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     220    535    750    520      * AVEDEL  s  10.8 *
* CAPACITY    veh    1525    886   1823    687      * LOS   SIG     B *
* AVE DELAY  mins    0.05   0.17   0.06   0.42      * LOS UNSIG     B *
* MAX DELAY  mins    0.06   0.25   0.08   0.75      *                  *
* AVE QUEUE   veh       0      2      1      4      * VEHIC HRS   6.1 *
* MAX QUEUE   veh       0      2      1      6      * COST    $    91 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - CHERYL/SYENE                 14  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.31   4.27   7.92   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB CHERYL*1.05*   25  565  295  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   65  155   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   55  200  275  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  130  310  140  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     885    230    530    580      * AVEDEL  s  12.8 *
* CAPACITY    veh    1210    497   1759    770      * LOS   SIG     B *
* AVE DELAY  mins    0.21   0.24   0.05   0.36      * LOS UNSIG     B *
* MAX DELAY  mins    0.36   0.37   0.06   0.61      *                  *
* AVE QUEUE   veh       3      1      0      4      * VEHIC HRS   7.9 *
* MAX QUEUE   veh       5      1      1      5      * COST    $   118 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2025 BUILD - CHERYL/SYENE                       15  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*    5  140   75  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  235  270   30  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  140  555   55  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  325  145   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     220    535    750    520          * AVEDEL  s   5.6 *
* CAPACITY    veh    1722   1083   2020    885          * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.11   0.05   0.17          * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.15   0.06   0.26          *                  *
* AVE QUEUE   veh       0      1      1      2          * VEHIC HRS   3.2 *
* MAX QUEUE   veh       0      1      1      2          * COST    $    47 *
*                                                        *                    *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09                2025 BUILD - CHERYL/SYENE                       16  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   25  565  295  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   65  155   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   55  200  275  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  130  310  140  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     885    230    530    580          * AVEDEL  s   6.8 *
* CAPACITY    veh    1407    694   1956    967          * LOS   SIG     A *
* AVE DELAY  mins    0.12   0.13   0.04   0.16          * LOS UNSIG     A *
* MAX DELAY  mins    0.19   0.19   0.05   0.24          *                  *
* AVE QUEUE   veh       2      1      0      2          * VEHIC HRS   4.2 *
* MAX QUEUE   veh       2      1      0      2          * COST    $    63 *
*                                                        *                    *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - CHERYL/NEW LACY                   24  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   7.31   7.92           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   80  345    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  725   40    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  710 1030    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     425    765   1740              * AVEDEL  s   9.8 *
* CAPACITY    veh    1334   1462   2077              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.09   0.22              * LOS UNSIG     A *
* MAX DELAY  mins    0.09   0.12   0.40              *                      *
* AVE QUEUE   veh       0      1      7              * VEHIC HRS   7.9 *
* MAX QUEUE   veh       1      1     11              * COST    $   119 *
*                                                    *                      *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - CHERYL/NEW LACY                   25  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   7.31   7.92           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   45  725    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  865   60    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  470  595    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     770    925   1065              * AVEDEL  s   7.7 *
* CAPACITY    veh    1658   1209   2062              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.26   0.06              * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.46   0.08              *                      *
* AVE QUEUE   veh       1      4      1              * VEHIC HRS   5.9 *
* MAX QUEUE   veh       1      6      1              * COST    $    88 *
*                                                    *                      *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - CHERYL/NEW LACY                    26  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   7.31   7.92           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   80  345    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  725   40    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  710 1030    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     425    765   1740              * AVEDEL  s   5.9 *
* CAPACITY    veh    1531   1659   2274              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.07   0.12              * LOS UNSIG     A *
* MAX DELAY  mins    0.07   0.09   0.20              *                      *
* AVE QUEUE   veh       0      1      4              * VEHIC HRS   4.8 *
* MAX QUEUE   veh       0      1      5              * COST    $    72 *
*                                                    *                      *
*****************************************************************************



*****************************************************************************
*                                                                           *
*   9:1:09               2025 BUILD - CHERYL/NEW LACY                    27  *
*                                                                           *
*****************************************************************************
*                                          *                                *
* E    (m)    7.92   7.31   7.92           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  90.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   45  725    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  865   60    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  470  595    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*****************************************************************************
*                                                    *                      *
* FLOW        veh     770    925   1065              * AVEDEL  s   4.7 *
* CAPACITY    veh    1855   1407   2259              * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.13   0.05              * LOS UNSIG     A *
* MAX DELAY  mins    0.08   0.21   0.07              *                      *
* AVE QUEUE   veh       1      2      1              * VEHIC HRS   3.6 *
* MAX QUEUE   veh       1      3      1              * COST    $    55 *
*                                                    *                      *
*****************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - IRISH/SYENE                  18  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*   35   45  125  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  770  115  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*  130   70    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   40  255   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     205    886    205    345     * AVEDEL  s   58.0 *
* CAPACITY    veh     853    908    474    922     * LOS   SIG      E *
* AVE DELAY  mins    0.09   1.68   0.22   0.10     * LOS UNSIG      F *
* MAX DELAY  mins    0.12   3.37   0.32   0.14     *                    *
* AVE QUEUE   veh       0     28      1      1     * VEHIC HRS  26.4 *
* MAX QUEUE   veh       0     51      1      1     * COST    $   396 *
*                                                  *                    *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - IRISH/SYENE                  19  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*  110   60   30  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  145   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   60   45    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  120  630  125  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     200    196    110    875     * AVEDEL  s   30.9 *
* CAPACITY    veh     603    911    901    971     * LOS   SIG      C *
* AVE DELAY  mins    0.15   0.08   0.07   0.75     * LOS UNSIG      D *
* MAX DELAY  mins    0.21   0.11   0.10   1.51     *                    *
* AVE QUEUE   veh       1      0      0     11     * VEHIC HRS  11.9 *
* MAX QUEUE   veh       1      0      0     21     * COST    $   178 *
*                                                  *                    *
*************************************************************************
```

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*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - IRISH/SYENE                  20  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*   35   45  125  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  770  115  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*  130   70    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   40  255   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     205    886    205    345     * AVEDEL  s   12.5 *
* CAPACITY    veh    1050   1106    660   1118     * LOS   SIG      B *
* AVE DELAY  mins    0.07   0.31   0.13   0.08     * LOS UNSIG      B *
* MAX DELAY  mins    0.09   0.54   0.19   0.10     *                    *
* AVE QUEUE   veh       0      5      0      0     * VEHIC HRS    5.7 *
* MAX QUEUE   veh       0      7      1      1     * COST    $     86 *
*                                                  *                    *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - IRISH/SYENE                  21  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*  110   60   30  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  145   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   60   45    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  120  630  125  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                  *                    *
* FLOW        veh     200    196    110    875     * AVEDEL  s    9.9 *
* CAPACITY    veh     799   1108   1098   1168     * LOS   SIG      A *
* AVE DELAY  mins    0.10   0.06   0.06   0.22     * LOS UNSIG      A *
* MAX DELAY  mins    0.14   0.08   0.08   0.35     *                    *
* AVE QUEUE   veh       0      0      0      3     * VEHIC HRS    3.8 *
* MAX QUEUE   veh       0      0      0      5     * COST    $     57 *
*                                                  *                    *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2025 BUILD - LACY/RESEARCH PARK                 11  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  210  320  105  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   30   30  135  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   15  235   85  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   15   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                  *
* FLOW        veh     635    195    335     35          * AVEDEL  s   8.8 *
* CAPACITY    veh     965    784    876    772          * LOS   SIG     A *
* AVE DELAY  mins    0.18   0.10   0.11   0.08          * LOS UNSIG     A *
* MAX DELAY  mins    0.27   0.13   0.15   0.10          *                  *
* AVE QUEUE   veh       2      0      1      0          * VEHIC HRS   2.9 *
* MAX QUEUE   veh       3      0      1      0          * COST    $    44 *
*                                                        *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09              2025 BUILD - LACY/RESEARCH PARK                 13  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  155  300   35  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   75   15  230  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  365   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  120   30   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*************************************************************************
*                                                        *                  *
* FLOW        veh     490    320    400    170          * AVEDEL  s   7.2 *
* CAPACITY    veh     985    828    870    680          * LOS   SIG     A *
* AVE DELAY  mins    0.12   0.12   0.13   0.12          * LOS UNSIG     A *
* MAX DELAY  mins    0.16   0.16   0.18   0.16          *                  *
* AVE QUEUE   veh       1      1      1      0          * VEHIC HRS   2.8 *
* MAX QUEUE   veh       1      1      1      0          * COST    $    41 *
*                                                        *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2025 BUILD - LACY/RESEARCH PARK                 14  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  210  320  105  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   30   30  135  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   15  235   85  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   15   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     635    195    335     35      * AVEDEL  s   5.8 *
* CAPACITY    veh    1162    981   1073    969      * LOS   SIG     A *
* AVE DELAY  mins    0.11   0.07   0.08   0.06      * LOS UNSIG     A *
* MAX DELAY  mins    0.16   0.10   0.11   0.08      *                  *
* AVE QUEUE   veh       1      0      0      0      * VEHIC HRS   1.9 *
* MAX QUEUE   veh       2      0      1      0      * COST    $    29 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09              2025 BUILD - LACY/RESEARCH PARK                 15  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  155  300   35  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   75   15  230  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  365   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  120   30   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     490    320    400    170      * AVEDEL  s   5.1 *
* CAPACITY    veh    1182   1025   1067    877      * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.08   0.09   0.08      * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.11   0.12   0.11      *                  *
* AVE QUEUE   veh       1      0      1      0      * VEHIC HRS   2.0 *
* MAX QUEUE   veh       1      1      1      0      * COST    $    30 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - LACY/NOBEL                   16  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   90  285  105  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*   45  315   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   50  320  110  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  480  140  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     480    385    480    620      * AVEDEL  s  21.7 *
* CAPACITY    veh     619    731    778    772      * LOS   SIG     C *
* AVE DELAY  mins    0.53   0.17   0.21   0.47      * LOS UNSIG     C *
* MAX DELAY  mins    0.99   0.26   0.31   0.85      *                  *
* AVE QUEUE   veh       4      1      2      5      * VEHIC HRS  11.8 *
* MAX QUEUE   veh       7      1      2      8      * COST    $   177 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - LACY/NOBEL                   17  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   40  225  275  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*  100  300   90  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  130  200   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  270   65  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     540    490    380    335      * AVEDEL  s  13.5 *
* CAPACITY    veh     811    711    655    837      * LOS   SIG     B *
* AVE DELAY  mins    0.23   0.29   0.23   0.12      * LOS UNSIG     B *
* MAX DELAY  mins    0.36   0.48   0.35   0.16      *                  *
* AVE QUEUE   veh       2      2      1      1      * VEHIC HRS   6.6 *
* MAX QUEUE   veh       3      4      2      1      * COST    $    98 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - LACY/NOBEL                   18  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   90  285  105  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*   45  315   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   50  320  110  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  480  140  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     480    385    480    620      * AVEDEL  s   9.1 *
* CAPACITY    veh     816    928    975    970      * LOS   SIG     A *
* AVE DELAY  mins    0.19   0.11   0.12   0.18      * LOS UNSIG     A *
* MAX DELAY  mins    0.29   0.15   0.17   0.27      *                  *
* AVE QUEUE   veh       2      1      1      2      * VEHIC HRS   5.0 *
* MAX QUEUE   veh       2      1      1      3      * COST    $    75 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - LACY/NOBEL                   19  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   40  225  275  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*  100  300   90  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  130  200   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  000  270   65  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     540    490    380    335      * AVEDEL  s   7.5 *
* CAPACITY    veh    1009    908    852   1034      * LOS   SIG     A *
* AVE DELAY  mins    0.13   0.15   0.13   0.08      * LOS UNSIG     A *
* MAX DELAY  mins    0.18   0.21   0.18   0.11      *                  *
* AVE QUEUE   veh       1      1      1      0      * VEHIC HRS   3.6 *
* MAX QUEUE   veh       1      2      1      1      * COST    $    54 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2025 BUILD - CHERYL/FAHEY                       30  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   20  720    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    1    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  345   30    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     740      6    375                  * AVEDEL  s  10.9 *
* CAPACITY    veh    1010    625   1026                  * LOS   SIG     B *
* AVE DELAY  mins    0.23   0.10   0.09                  * LOS UNSIG     B *
* MAX DELAY  mins    0.36   0.13   0.12                  *                  *
* AVE QUEUE   veh       3      0      1                  * VEHIC HRS   3.4 *
* MAX QUEUE   veh       4      0      1                  * COST    $    51 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2025 BUILD - CHERYL/FAHEY                       31  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*    5  495    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   25   25    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  900    5    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     500     50    905                  * AVEDEL  s  27.1 *
* CAPACITY    veh    1024    750   1013                  * LOS   SIG     C *
* AVE DELAY  mins    0.11   0.08   0.66                  * LOS UNSIG     D *
* MAX DELAY  mins    0.15   0.11   1.30                  *                  *
* AVE QUEUE   veh       1      0     10                  * VEHIC HRS  11.0 *
* MAX QUEUE   veh       1      0     19                  * COST    $   165 *
*                                                        *                    *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - CHERYL/FAHEY                 32  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   20  720    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    1    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  345   30    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     740      6    375              * AVEDEL  s   6.5 *
* CAPACITY    veh    1207    821   1223              * LOS   SIG     A *
* AVE DELAY  mins    0.13   0.07   0.07              * LOS UNSIG     A *
* MAX DELAY  mins    0.18   0.09   0.09              *                  *
* AVE QUEUE   veh       2      0      0              * VEHIC HRS   2.0 *
* MAX QUEUE   veh       2      0      1              * COST    $    30 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                2025 BUILD - CHERYL/FAHEY                 33  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27           * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00           * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*    5  495    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   25   25    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  900    5    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     500     50    905              * AVEDEL  s   9.5 *
* CAPACITY    veh    1221    947   1210              * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.07   0.21              * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.08   0.33              *                  *
* AVE QUEUE   veh       1      0      3              * VEHIC HRS   3.8 *
* MAX QUEUE   veh       1      0      4              * COST    $    58 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09             2025 BUILD - CHERYL/RESEARCH PARK                  26  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   15  615  125  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10   15   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   25  265    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*   25    5   15  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     755     35    295     45           * AVEDEL  s   2.8 *
* CAPACITY    veh    2084    627   1592    878           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.10   0.05   0.07           * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.13   0.06   0.09           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   0.9 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    13 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09             2025 BUILD - CHERYL/RESEARCH PARK                  27  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   10  365   90  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10    5   40  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  770   15  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*  175   20   55  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     465     55    800    250           * AVEDEL  s   4.8 *
* CAPACITY    veh    2035    756   1602    589           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.08   0.07   0.18           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.11   0.10   0.27           *                  *
* AVE QUEUE   veh       0      0      1      1           * VEHIC HRS   2.1 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    32 *
*                                                        *                    *
*******************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09             2025 BUILD - CHERYL/RESEARCH PARK                  28  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   15  615  125  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10   15   10  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   25  265    5  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*   25    5   15  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     755     35    295     45           * AVEDEL  s   2.4 *
* CAPACITY    veh    2281    824   1789   1075           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.07   0.04   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.10   0.05   0.07           *                  *
* AVE QUEUE   veh       0      0      0      0           * VEHIC HRS   0.8 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    11 *
*                                                        *                  *
*****************************************************************************
```

```
*****************************************************************************
*                                                                           *
*   9:1:09             2025 BUILD - CHERYL/RESEARCH PARK                  29  *
*                                                                           *
*****************************************************************************
*                                                *                          *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                          *
*****************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   10  365   90  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RESRCH*1.05*   10    5   40  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  770   15  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RESRCH*1.05*  175   20   55  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*****************************************************************************
*                                                        *                  *
* FLOW        veh     465     55    800    250           * AVEDEL  s   3.6 *
* CAPACITY    veh    2232    953   1799    787           * LOS   SIG     A *
* AVE DELAY  mins    0.03   0.07   0.06   0.11           * LOS UNSIG     A *
* MAX DELAY  mins    0.04   0.08   0.08   0.16           *                  *
* AVE QUEUE   veh       0      0      1      0           * VEHIC HRS   1.6 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    24 *
*                                                        *                  *
*****************************************************************************
```

APPENDIX E

Year 2035 Build Traffic Peak Hour Analysis *With Improvements*

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	330	15	1135	325	645	705	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	0.99		0.98	1.00		0.97
Frt		0.919				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1646	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.754			0.717			0.950			0.950		
Satd. Flow (perm)	1355	1646	0	1289	1810	1514	1707	3438	1514	3329	3438	1500
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	167	28	33	100	6	183	17	1261	181	717	783	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	61	0	100	6	183	17	1261	181	717	783	17
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	25.0	15.0	40.0	40.0	25.0	50.0	50.0
Total Split (%)	27.8%	27.8%	0.0%	27.8%	27.8%	27.8%	16.7%	44.4%	44.4%	27.8%	55.6%	55.6%
Maximum Green (s)	19.0	19.0		19.0	19.0	20.5	10.5	34.0	34.0	20.5	44.0	44.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

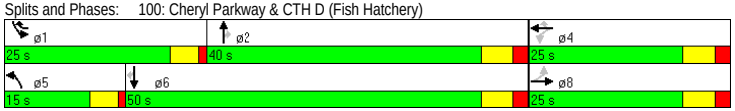
Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.74	0.22		0.47	0.02	0.28	0.11	0.90	0.29	0.89	0.35	0.02
Control Delay	54.4	32.9		40.1	29.0	14.8	36.5	29.6	19.2	47.6	9.6	9.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	32.9		40.1	29.0	14.8	36.5	29.6	19.2	47.6	9.6	9.4
90th %ile Green (s)	19.0	19.0		19.0	19.0	20.5	8.0	34.0	34.0	20.5	46.5	46.5
90th %ile Term Code	Max	Max		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	18.1	18.1		18.1	18.1	21.4	8.0	34.0	34.0	21.4	47.4	47.4
70th %ile Term Code	Gap	Gap		Hold	Hold	Max	Min	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	15.4	15.4		15.4	15.4	24.1	0.0	34.0	34.0	24.1	62.6	62.6
50th %ile Term Code	Gap	Gap		Hold	Hold	Max	Skip	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	12.6	12.6		12.6	12.6	23.3	0.0	37.6	37.6	23.3	65.4	65.4
30th %ile Term Code	Gap	Gap		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	10.0	10.0		10.0	10.0	20.0	0.0	43.5	43.5	20.0	68.0	68.0
10th %ile Term Code	Min	Min		Hold	Hold	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	91	30		52	3	56	9	213	58	195	79	3
Queue Length 95th (ft)	153	63		97	13	96	m13	#498	m92	#318	184	15
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	286	347		272	382	653	201	1399	616	814	2215	966
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.18		0.37	0.02	0.28	0.08	0.90	0.29	0.88	0.35	0.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 10 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	25	30	90	5	330	15	1135	325	645	705	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1704	1644		1705	1810	1528	1719	3438	1514	3335	3438	1501
Flt Permitted	0.75	1.00		0.72	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1352	1644		1287	1810	1528	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	167	28	33	100	6	183	17	1261	181	717	783	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	167	61	0	100	6	183	17	1261	181	717	783	17
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	15.0	15.0		15.0	15.0	36.9	3.2	36.6	36.6	21.9	55.3	55.3
Effective Green, g (s)	15.0	15.0		15.0	15.0	36.9	3.2	36.6	36.6	21.9	55.3	55.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.41	0.04	0.41	0.41	0.24	0.61	0.61
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	225	274		215	302	626	61	1398	616	812	2112	922
v/s Ratio Prot		0.04			0.00	0.07	0.01	c0.37		c0.21	0.23	
v/s Ratio Perm	c0.12			0.08		0.05			0.12			0.01
v/c Ratio	0.74	0.22		0.47	0.02	0.29	0.28	0.90	0.29	0.88	0.37	0.02
Uniform Delay, d1	35.7	32.5		33.9	31.4	17.8	42.3	25.0	18.0	32.8	8.7	6.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.93	0.82	0.94	1.00	1.00	1.00
Incremental Delay, d2	10.9	0.2		0.6	0.0	0.1	0.6	7.1	0.8	10.9	0.5	0.0
Delay (s)	46.6	32.6		34.5	31.4	17.9	40.0	27.5	17.8	43.7	9.2	6.8
Level of Service	D	C		C	C	B	D	C	B	D	A	A
Approach Delay (s)		42.9			23.9			26.5			25.5	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	26.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	78.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	190	175	865	0	0	0	0	470	1	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	*0.88	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4777	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.206						0.950	0.953	
Satd. Flow (perm)	0	4777	1538	373	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1233	106	194	961	0	0	0	0	522	1	1057
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1233	106	194	961	0	0	0	0	261	262	1057
Turn Type			Perm	pm+pt						Perm		custom
Protected Phases		6		5	2						4	1
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	1
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	6.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	9.5
Total Split (s)	0.0	40.0	40.0	15.0	35.0	0.0	0.0	0.0	0.0	25.0	25.0	20.0
Total Split (%)	0.0%	50.0%	50.0%	18.8%	43.8%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	25.0%
Maximum Green (s)		34.0	34.0	11.5	29.0					19.0	19.0	16.5
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	3.5
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	3.5
Lead/Lag		Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

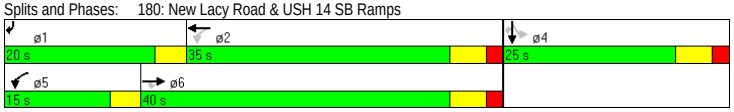
Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.52	0.14	0.57	0.70					0.80	0.80	0.81
Control Delay		15.4	13.1	14.4	15.0					48.4	48.4	23.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		15.4	13.1	14.4	15.0					48.4	48.4	23.2
90th %ile Green (s)		34.0	34.0	11.5	29.0					19.0	19.0	16.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Max
70th %ile Green (s)		35.6	35.6	9.9	29.0					19.0	19.0	16.5
70th %ile Term Code		Coord	Coord	Gap	Coord					Max	Max	Max
50th %ile Green (s)		39.5	39.5	7.8	29.3					17.2	17.2	18.0
50th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
30th %ile Green (s)		43.3	43.3	6.7	32.6					14.5	14.5	17.4
30th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
10th %ile Green (s)		48.0	48.0	6.0	40.3					10.5	10.5	13.7
10th %ile Term Code		Coord	Coord	Min	Coord					Gap	Gap	Gap
Queue Length 50th (ft)		150	27	74	240					129	129	224
Queue Length 95th (ft)		221	63	m42	m282					#214	#216	309
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		2393	770	408	1377					388	389	1320
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.52	0.14	0.48	0.70					0.67	0.67	0.80

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	190	175	865	0	0	0	0	470	1	1285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	3.5
Lane Util. Factor		*0.88	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4777	1538	1719	3438					1633	1637	2707
Flt Permitted		1.00	1.00	0.21	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4777	1538	372	3438					1633	1637	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1233	106	194	961	0	0	0	0	522	1	1057
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1233	106	194	961	0	0	0	0	261	262	1057
Turn Type			Perm	pm+pt						Perm		custom
Protected Phases		6		5	2						4	1
Permitted Phases			6	2						4		4
Actuated Green, G (s)		40.1	40.1	40.5	32.1					16.0	16.0	32.4
Effective Green, g (s)		40.1	40.1	40.5	32.1					16.0	16.0	32.4
Actuated g/C Ratio		0.50	0.50	0.51	0.40					0.20	0.20	0.40
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	3.5
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		2394	771	330	1379					327	327	1096
v/s Ratio Prot		0.26		0.06	c0.28							c0.20
v/s Ratio Perm			0.07	0.24						0.16	0.16	0.19
v/c Ratio		0.52	0.14	0.59	0.70					0.80	0.80	0.96
Uniform Delay, d1		13.4	10.7	11.0	19.9					30.5	30.5	23.2
Progression Factor		1.00	1.00	1.44	0.63					1.00	1.00	1.00
Incremental Delay, d2		0.8	0.4	0.8	1.6					11.9	12.5	18.9
Delay (s)		14.2	11.1	16.6	14.1					42.4	42.9	42.2
Level of Service		B	B	B	B					D	D	D
Approach Delay (s)		14.0			14.6			0.0			42.3	
Approach LOS		B			B			A			D	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	800	780	0	0	790	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	889	867	0	0	878	244	278	1	86	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	889	867	0	0	878	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	30.0	55.0	0.0	0.0	25.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	37.5%	68.8%	0.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

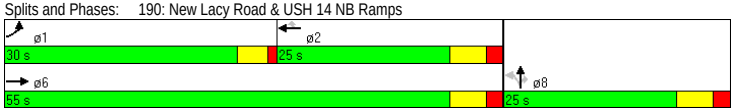
Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.89	0.39			0.88	0.55		0.80	0.28			
Control Delay	25.9	3.9			41.3	31.5		47.8	28.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	25.9	3.9			41.3	31.5		47.8	28.2			
90th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
90th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
70th %ile Green (s)	25.5	49.0			19.0	19.0	19.0	19.0	19.0			
70th %ile Term Code	Max	Coord			Coord	Coord	Max	Max	Max			
50th %ile Green (s)	25.7	50.7			20.5	20.5	17.3	17.3	17.3			
50th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	23.5	53.3			25.3	25.3	14.7	14.7	14.7			
30th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	20.1	57.2			32.6	32.6	10.8	10.8	10.8			
10th %ile Term Code	Gap	Coord			Coord	Coord	Gap	Gap	Gap			
Queue Length 50th (ft)	222	73			231	108		131	36			
Queue Length 95th (ft)	#315	61			#376	#195		#215	73			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1065	2228			1001	447		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.83	0.39			0.88	0.55		0.68	0.24			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	800	780	0	0	790	440	250	1	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	889	867	0	0	878	244	278	1	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	889	867	0	0	878	244	0	279	86	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	24.1	51.8			23.2	23.2		16.2	16.2			
Effective Green, g (s)	24.1	51.8			23.2	23.2		16.2	16.2			
Actuated g/C Ratio	0.30	0.65			0.29	0.29		0.20	0.20			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1005	2226			997	446		349	311			
v/s Ratio Prot	c0.27	0.25			c0.26							
v/s Ratio Perm						0.16		0.16	0.06			
v/c Ratio	0.88	0.39			0.88	0.55		0.80	0.28			
Uniform Delay, d1	26.6	6.6			27.1	24.0		30.4	26.9			
Progression Factor	0.57	0.49			1.00	1.00		1.00	1.00			
Incremental Delay, d2	8.1	0.4			11.0	4.8		11.3	0.2			
Delay (s)	23.2	3.7			38.1	28.7		41.7	27.1			
Level of Service	C	A			D	C		D	C			
Approach Delay (s)		13.5			36.1			38.2			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	430	210	45	190	225	140	855	125	160	505	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		150	155		150	100		175	150		150
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00		0.98	1.00		0.98	1.00		0.98
Frt		0.951				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	3250	0	1719	3438	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.495			0.381			0.376			0.156		
Satd. Flow (perm)	893	3250	0	688	3438	1505	679	3438	1513	282	3438	1513
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	372	478	233	50	211	125	156	950	69	178	561	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	372	711	0	50	211	125	156	950	69	178	561	53
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		9.5	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	20.0	28.0	0.0	12.0	20.0	20.0	12.0	38.0	38.0	12.0	38.0	38.0
Total Split (%)	22.2%	31.1%	0.0%	13.3%	22.2%	22.2%	13.3%	42.2%	42.2%	13.3%	42.2%	42.2%
Maximum Green (s)	16.5	22.0		8.5	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
Yellow Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

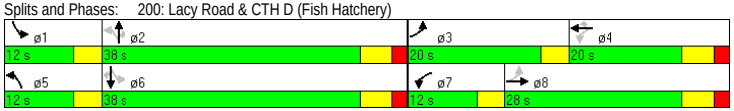
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		0.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		0.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.76	0.77		0.21	0.45	0.60	0.36	0.72	0.12	0.66	0.42	0.09
Control Delay	33.3	37.1		19.9	38.4	48.9	5.9	9.2	6.4	35.3	21.7	21.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	37.1		19.9	38.4	48.9	5.9	9.2	6.4	35.3	21.7	21.6
90th %ile Green (s)	16.5	22.5		8.0	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
90th %ile Term Code	Max	Max		Gap	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	16.5	23.7		6.8	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
70th %ile Term Code	Max	Max		Gap	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	16.5	24.4		6.1	14.0	14.0	8.5	32.0	32.0	8.5	32.0	32.0
50th %ile Term Code	Max	Max		Gap	Hold	Hold	Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	17.0	30.5		0.0	10.0	10.0	7.3	35.9	35.9	8.1	36.7	36.7
30th %ile Term Code	Gap	Hold		Skip	Min	Min	Gap	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	13.2	26.7		0.0	10.0	10.0	6.0	41.5	41.5	6.3	41.8	41.8
10th %ile Term Code	Gap	Hold		Skip	Min	Min	Min	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	157	198		17	57	66	12	38	5	43	90	16
Queue Length 95th (ft)	#245	#303		40	92	123	m13	m40	m6	#159	158	48
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155		150	100		175	150		150
Base Capacity (vph)	493	923		276	535	234	443	1324	583	279	1333	587
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.77		0.18	0.39	0.53	0.35	0.72	0.12	0.64	0.42	0.09

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	430	210	45	190	225	140	855	125	160	505	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1717	3251		1717	3438	1505	1718	3438	1514	1719	3438	1514
Flt Permitted	0.49	1.00		0.38	1.00	1.00	0.38	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	894	3251		689	3438	1505	681	3438	1514	283	3438	1514
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	372	478	233	50	211	125	156	950	69	178	561	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	372	711	0	50	211	125	156	950	69	178	561	53
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	33.3	25.6		18.1	13.9	13.9	41.0	33.2	33.2	41.4	33.4	33.4
Effective Green, g (s)	33.3	25.6		18.1	13.9	13.9	41.0	33.2	33.2	41.4	33.4	33.4
Actuated g/C Ratio	0.37	0.28		0.20	0.15	0.15	0.46	0.37	0.37	0.46	0.37	0.37
Clearance Time (s)	3.5	6.0		3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	476	925		187	531	232	400	1268	558	258	1276	562
v/s Ratio Prot	c0.14	0.22		0.01	0.06		0.03	c0.28		c0.06	0.16	
v/s Ratio Perm	c0.15			0.04		0.08	0.14		0.05	0.26		0.04
v/c Ratio	0.78	0.77		0.27	0.40	0.54	0.39	0.75	0.12	0.69	0.44	0.09
Uniform Delay, d1	22.9	29.5		29.6	34.3	35.1	14.8	24.8	18.8	16.8	21.3	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.42	0.32	0.32	1.89	0.98	1.10
Incremental Delay, d2	7.5	3.5		0.3	0.2	1.2	0.1	1.8	0.2	5.7	1.1	0.3
Delay (s)	30.4	33.0		29.9	34.5	36.3	6.4	9.6	6.2	37.4	22.0	20.6
Level of Service	C	C		C	C	D	A	A	A	D	C	C
Approach Delay (s)		32.1			34.5			9.0			25.3	
Approach LOS		C			C			A			C	

Intersection Summary

HCM Average Control Delay	22.9	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		13.0	
Intersection Capacity Utilization	76.8%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	305	30	25	365	15	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.876	
Flt Protected			0.950		0.996	
Satd. Flow (prot)	1810	1538	1719	1810	1579	0
Flt Permitted			0.950		0.996	
Satd. Flow (perm)	1810	1538	1719	1810	1579	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	339	33	28	406	17	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	339	33	28	406	200	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	305	30	25	365	15	165
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	339	33	28	406	17	183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			372		800	339
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			372		800	339
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	74
cM capacity (veh/h)			1170		342	697

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	339	33	28	406	200
Volume Left	0	0	28	0	17
Volume Right	0	33	0	0	183
cSH	1700	1700	1170	1700	641
Volume to Capacity	0.20	0.02	0.02	0.24	0.31
Queue Length 95th (ft)	0	0	2	0	33
Control Delay (s)	0.0	0.0	8.2	0.0	13.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.5		13.1
Approach LOS					B

Intersection Summary				
Average Delay		2.8		
Intersection Capacity Utilization		38.5%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	445	5	30	530	1	1	1	20	1	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.876			0.879	
Flt Protected	0.950			0.950				0.998			0.997	
Satd. Flow (prot)	1719	1810	1538	1719	1810	0	0	1582	0	0	1586	0
Flt Permitted	0.950			0.950				0.998			0.997	
Satd. Flow (perm)	1719	1810	1538	1719	1810	0	0	1582	0	0	1586	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	494	6	33	589	1	1	1	22	1	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	494	6	33	590	0	0	24	0	0	19	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	445	5	30	530	1	1	1	20	1	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	494	6	33	589	1	1	1	22	1	1	17
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	590			505			1211	1189	504	1212	1194	594
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590			505			1211	1189	504	1212	1194	594
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			99	99	96	99	99	97
cM capacity (veh/h)	971			1040			144	176	557	143	174	497

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	17	494	6	33	590	24	19
Volume Left	17	0	0	33	0	1	1
Volume Right	0	0	6	0	1	22	17
cSH	971	1700	1700	1040	1700	453	396
Volume to Capacity	0.02	0.29	0.00	0.03	0.35	0.05	0.05
Queue Length 95th (ft)	1	0	0	2	0	4	4
Control Delay (s)	8.8	0.0	0.0	8.6	0.0	13.4	14.5
Lane LOS	A			A		B	B
Approach Delay (s)	0.3			0.5		13.4	14.5
Approach LOS						B	B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	39.5%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	435	20	45	535	30	15	1	45	25	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		125	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993				0.850		0.901			0.928	
Flt Protected	0.950			0.950				0.988			0.978	
Satd. Flow (prot)	1719	1797	0	1719	1810	1538	0	1611	0	0	1642	0
Flt Permitted	0.950			0.950				0.988			0.978	
Satd. Flow (perm)	1719	1797	0	1719	1810	1538	0	1611	0	0	1642	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	483	22	50	594	33	17	1	50	28	1	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	505	0	50	594	33	0	68	0	0	62	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	435	20	45	535	30	15	1	45	25	1	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	483	22	50	594	33	17	1	50	28	1	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)					991							
pX, platoon unblocked	0.76						0.76	0.76		0.76	0.76	0.76
vC, conflicting volume	628			506			1256	1256	494	1262	1233	594
vC1, stage 1 conf vol							528	528		694	694	
vC2, stage 2 conf vol							728	728		567	539	
vCu, unblocked vol	354			506			1179	1179	494	1187	1150	310
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			95	100	91	91	100	94
cM capacity (veh/h)	904			1044			307	322	569	303	328	550

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	17	506	50	594	33	68	62
Volume Left	17	0	50	0	0	17	28
Volume Right	0	22	0	0	33	50	33
cSH	904	1700	1044	1700	1700	465	400
Volume to Capacity	0.02	0.30	0.05	0.35	0.02	0.15	0.16
Queue Length 95th (ft)	1	0	4	0	0	13	14
Control Delay (s)	9.1	0.0	8.6	0.0	0.0	14.1	15.7
Lane LOS	A		A			B	C
Approach Delay (s)	0.3		0.6			14.1	15.7
Approach LOS						B	C

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	335	10	55	485	55	40	380	180	40	120	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99		0.98	1.00		0.97
Frt		0.996			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1801	0	1719	1778	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.188			0.535			0.672			0.264		
Satd. Flow (perm)	340	1801	0	965	1778	0	1207	1810	1512	477	1810	1494
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	178	372	11	61	539	61	44	422	100	44	133	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	383	0	61	600	0	44	422	100	44	133	47
Turn Type	pm+pt			Perm			Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	1	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	10.0	47.0	0.0	37.0	37.0	0.0	28.0	28.0	28.0	28.0	28.0	28.0
Total Split (%)	13.3%	62.7%	0.0%	49.3%	49.3%	0.0%	37.3%	37.3%	37.3%	37.3%	37.3%	37.3%
Maximum Green (s)	6.5	41.0		31.0	31.0		22.0	22.0	22.0	22.0	22.0	22.0
Yellow Time (s)	3.5	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

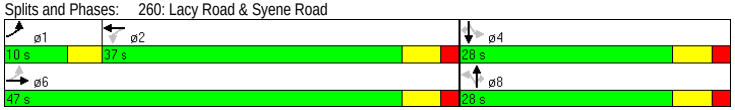
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.54	0.39		0.16	0.83		0.13	0.85	0.24	0.34	0.27	0.11
Control Delay	13.7	10.8		15.1	31.4		20.8	41.7	21.9	29.0	21.9	20.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	10.8		15.1	31.4		20.8	41.7	21.9	29.0	21.9	20.3
90th %ile Green (s)	6.5	41.0		31.0	31.0		22.0	22.0	22.0	22.0	22.0	22.0
90th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	6.5	41.0		31.0	31.0		22.0	22.0	22.0	22.0	22.0	22.0
70th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Hold	Hold	Hold
50th %ile Green (s)	6.5	41.0		31.0	31.0		22.0	22.0	22.0	22.0	22.0	22.0
50th %ile Term Code	Max	Hold		Max	Max		Max	Max	Max	Hold	Hold	Hold
30th %ile Green (s)	6.5	38.0		28.0	28.0		18.2	18.2	18.2	18.2	18.2	18.2
30th %ile Term Code	Max	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	29.4		19.9	19.9		12.4	12.4	12.4	12.4	12.4	12.4
10th %ile Term Code	Min	Hold		Gap	Gap		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	35	95		17	239		15	180	35	16	47	16
Queue Length 95th (ft)	64	152		41	#418		39	#320	72	46	90	40
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	330	1082		438	807		389	583	488	154	583	481
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.35		0.14	0.74		0.11	0.72	0.20	0.29	0.23	0.10

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 69.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 75
50th %ile Actuated Cycle: 75
30th %ile Actuated Cycle: 68.2
10th %ile Actuated Cycle: 53.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	335	10	55	485	55	40	380	180	40	120	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1800		1713	1777		1706	1810	1511	1715	1810	1494
Flt Permitted	0.19	1.00		0.53	1.00		0.67	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	340	1800		964	1777		1207	1810	1511	476	1810	1494
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	178	372	11	61	539	61	44	422	100	44	133	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	178	383	0	61	600	0	44	422	100	44	133	47
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	38.1	38.1		28.1	28.1		19.1	19.1	19.1	19.1	19.1	19.1
Effective Green, g (s)	38.1	38.1		28.1	28.1		19.1	19.1	19.1	19.1	19.1	19.1
Actuated g/C Ratio	0.55	0.55		0.41	0.41		0.28	0.28	0.28	0.28	0.28	0.28
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	317	991		391	722		333	500	417	131	500	412
v/s Ratio Prot	c0.05	0.21			c0.34			c0.23			0.07	
v/s Ratio Perm	0.26			0.06			0.04		0.07	0.09		0.03
v/c Ratio	0.56	0.39		0.16	0.83		0.13	0.84	0.24	0.34	0.27	0.11
Uniform Delay, d1	10.8	8.9		13.0	18.4		18.8	23.6	19.4	20.0	19.6	18.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.5		0.4	9.0		0.1	11.9	0.1	0.6	0.1	0.0
Delay (s)	12.2	9.4		13.4	27.4		18.9	35.5	19.5	20.5	19.7	18.8
Level of Service	B	A		B	C		B	D	B	C	B	B
Approach Delay (s)		10.3			26.1			31.4			19.7	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	115	10	195	10	1065	350	550	235	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	150		200	500		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00	0.98		0.99	0.98	1.00		0.97	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.960			0.956		0.950			0.950		
Satd. Flow (prot)	0	1737	1538	0	1730	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.653			0.695		0.591			0.113		
Satd. Flow (perm)	0	1176	1509	0	1250	1509	1064	3438	1497	204	3438	1502
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	8	128	11	108	11	1183	194	611	261	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	8	0	139	108	11	1183	194	611	261	11
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	21.0	21.0	21.0	9.5	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	38.0	38.0	38.0	27.0	65.0	65.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	27.8%	27.8%	42.2%	42.2%	42.2%	30.0%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	19.0	19.0	19.0	19.0	32.0	32.0	32.0	23.5	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

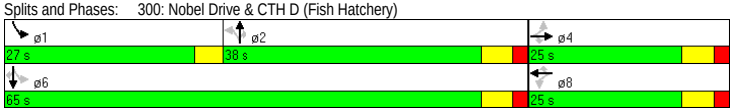
Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.36	0.03		0.69	0.45	0.03	0.97	0.36	0.98	0.11	0.01
Control Delay		37.8	29.7		53.4	39.3	16.0	45.4	20.5	50.9	4.0	4.9
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		37.8	29.7		53.4	39.3	16.0	45.4	20.5	50.9	4.0	4.9
90th %ile Green (s)	19.0	19.0	19.0	19.0	19.0	19.0	32.0	32.0	32.0	23.5	59.0	59.0
90th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	17.0	17.0	17.0	17.0	17.0	17.0	32.0	32.0	32.0	25.5	61.0	61.0
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	14.3	14.3	14.3	14.3	14.3	14.3	32.0	32.0	32.0	28.2	63.7	63.7
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	11.6	11.6	11.6	11.6	11.6	11.6	32.0	32.0	32.0	30.9	66.4	66.4
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	10.0	10.0	10.0	10.0	10.0	10.0	32.0	32.0	32.0	32.5	68.0	68.0
10th %ile Term Code	Hold	Hold	Hold	Min	Min	Min	Coord	Coord	Coord	Max	Coord	Coord
Queue Length 50th (ft)		34	4		76	56	4	349	85	112	17	1
Queue Length 95th (ft)		70	15		131	100	m9	#492	95	#587	m29	m4
Internal Link Dist (ft)		186			710			1314			1278	
Turn Bay Length (ft)						300	150		200	500		100
Base Capacity (vph)		248	319		264	319	378	1222	532	623	2430	1062
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.27	0.03		0.53	0.34	0.03	0.97	0.36	0.98	0.11	0.01

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 55 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Nobel Drive & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	115	10	195	10	1065	350	550	235	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1726	1506		1716	1506	1711	3438	1497	1719	3438	1502
Flt Permitted		0.65	1.00		0.69	1.00	0.59	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)		1174	1506		1247	1506	1063	3438	1497	204	3438	1502
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	56	11	8	128	11	108	11	1183	194	611	261	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	67	8	0	139	108	11	1183	194	611	261	11
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		14.4	14.4		14.4	14.4	32.0	32.0	32.0	63.6	63.6	63.6
Effective Green, g (s)		14.4	14.4		14.4	14.4	32.0	32.0	32.0	63.6	63.6	63.6
Actuated g/C Ratio		0.16	0.16		0.16	0.16	0.36	0.36	0.36	0.71	0.71	0.71
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		188	241		200	241	378	1222	532	617	2430	1061
v/s Ratio Prot								0.34		c0.31	0.08	
v/s Ratio Perm		0.06	0.01		c0.11	0.07	0.01		0.13	c0.39		0.01
v/c Ratio		0.36	0.03		0.69	0.45	0.03	0.97	0.36	0.99	0.11	0.01
Uniform Delay, d1		33.7	31.9		35.7	34.2	18.9	28.5	21.5	25.0	4.2	3.9
Progression Factor		1.00	1.00		1.00	1.00	0.82	0.90	0.85	0.76	0.83	0.99
Incremental Delay, d2		0.4	0.0		8.2	0.5	0.1	18.5	1.8	31.6	0.1	0.0
Delay (s)		34.1	31.9		43.9	34.7	15.7	44.1	20.0	50.6	3.6	3.9
Level of Service		C	C		D	C	B	D	C	D	A	A
Approach Delay (s)		33.9			39.9			40.5			36.1	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Volume
320: Nobel Drive & Mica Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	110	220	195	155	130	40	10	40	30	35	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		75	0		75
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.900			0.932				0.850			0.850
Flt Protected	0.950			0.950				0.962			0.978	
Satd. Flow (prot)	1719	1629	0	1719	1686	0	0	1741	1538	0	1770	1538
Flt Permitted	0.950			0.950				0.962			0.978	
Satd. Flow (perm)	1719	1629	0	1719	1686	0	0	1741	1538	0	1770	1538
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	122	244	217	172	144	44	11	44	33	39	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	366	0	217	316	0	0	55	44	0	72	28
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	145	110	220	195	155	130	40	10	40	30	35	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	122	244	217	172	144	44	11	44	33	39	28

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	161	367	217	317	56	44	72	28
Volume Left (vph)	161	0	217	0	44	0	33	0
Volume Right (vph)	0	244	0	144	0	44	0	28
Hadj (s)	0.58	-0.38	0.58	-0.23	0.48	-0.61	0.32	-0.61
Departure Headway (s)	6.4	5.4	6.4	5.6	7.5	6.4	7.4	6.4
Degree Utilization, x	0.29	0.55	0.38	0.49	0.12	0.08	0.15	0.05
Capacity (veh/h)	540	646	548	631	441	508	448	508
Control Delay (s)	10.8	13.8	12.1	12.6	10.3	8.8	10.5	8.6
Approach Delay (s)	12.9		12.4		9.7		9.9	
Approach LOS	B		B		A		A	

Intersection Summary					
Delay	12.2				
HCM Level of Service	B				
Intersection Capacity Utilization	50.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
330: Nobel Drive & Fahey Glen 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	155	15	120	400	1	25	15	55	10	30	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987						0.922			0.922	
Flt Protected	0.950			0.950				0.987			0.995	
Satd. Flow (prot)	1719	1786	0	1719	1810	0	0	1647	0	0	1660	0
Flt Permitted	0.950			0.950				0.987			0.995	
Satd. Flow (perm)	1719	1786	0	1719	1810	0	0	1647	0	0	1660	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	172	17	133	444	1	28	17	61	11	33	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	189	0	133	445	0	0	106	0	0	105	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	155	15	120	400	1	25	15	55	10	30	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	172	17	133	444	1	28	17	61	11	33	61
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			194			1002	925	191	986	933	455
vC1, stage 1 conf vol							208	208		717	717	
vC2, stage 2 conf vol							794	717		269	216	
vCu, unblocked vol	451			194			1002	925	191	986	933	455
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			90			89	95	93	97	91	90
cM capacity (veh/h)	1090			1356			258	357	837	333	358	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	189	133	446	106	106
Volume Left	11	0	133	0	28	11
Volume Right	0	17	0	1	61	61
cSH	1090	1700	1356	1700	464	460
Volume to Capacity	0.01	0.11	0.10	0.26	0.23	0.23
Queue Length 95th (ft)	1	0	8	0	22	22
Control Delay (s)	8.3	0.0	7.9	0.0	15.0	15.1
Lane LOS	A		A		C	C
Approach Delay (s)	0.5		1.8		15.0	15.1
Approach LOS					C	C

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	46.0%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	150	55	25	420	10	55	10	45	30	10	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960			0.997			0.945			0.928	
Flt Protected	0.950			0.950				0.976			0.983	
Satd. Flow (prot)	1719	1737	0	1719	1804	0	0	1669	0	0	1651	0
Flt Permitted	0.950			0.950				0.976			0.983	
Satd. Flow (perm)	1719	1737	0	1719	1804	0	0	1669	0	0	1651	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	167	61	28	467	11	61	11	50	33	11	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	228	0	28	478	0	0	122	0	0	94	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	150	55	25	420	10	55	10	45	30	10	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	167	61	28	467	11	61	11	50	33	11	50
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	483			233			818	774	207	793	799	482
vC1, stage 1 conf vol							236	236		533	533	
vC2, stage 2 conf vol							583	538		261	266	
vCu, unblocked vol	483			233			818	774	207	793	799	482
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			84	98	94	93	98	91
cM capacity (veh/h)	1060			1312			391	454	819	451	458	573

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	228	28	478	122	94
Volume Left	17	0	28	0	61	33
Volume Right	0	61	0	11	50	50
cSH	1060	1700	1312	1700	505	509
Volume to Capacity	0.02	0.13	0.02	0.28	0.24	0.19
Queue Length 95th (ft)	1	0	2	0	23	17
Control Delay (s)	8.5	0.0	7.8	0.0	14.4	13.7
Lane LOS	A		A		B	B
Approach Delay (s)	0.6		0.4		14.4	13.7
Approach LOS					B	B

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	39.8%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
360: Nobel Drive & Syene Road 1/7/2009

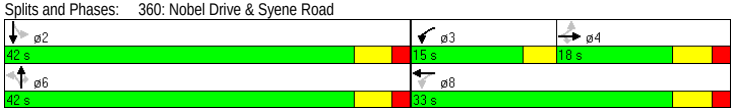
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	155	65	225	255	1	120	585	460	1	120	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	300		0	150		0	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.98	1.00	1.00		1.00		0.97	1.00	0.99	
Frt			0.850		0.999				0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1808	0	1719	1810	1538	1719	1699	0
Flt Permitted	0.586			0.494			0.629			0.220		
Satd. Flow (perm)	1049	1810	1506	891	1808	0	1134	1810	1499	397	1699	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	172	36	250	283	1	133	650	256	1	133	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	172	36	250	284	0	133	650	256	1	205	0
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Detector Phase	4	4	4	3	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0		15.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	16.0	16.0	16.0	9.5	16.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	18.0	18.0	18.0	15.0	33.0	0.0	42.0	42.0	42.0	42.0	42.0	0.0
Total Split (%)	24.0%	24.0%	24.0%	20.0%	44.0%	0.0%	56.0%	56.0%	56.0%	56.0%	56.0%	0.0%
Maximum Green (s)	12.0	12.0	12.0	11.5	27.0		36.0	36.0	36.0	36.0	36.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	

Volume
360: Nobel Drive & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.16	0.58	0.15	0.52	0.43		0.26	0.79	0.37	0.01	0.26	
Control Delay	29.8	37.1	28.7	20.0	20.1		13.0	23.7	14.0	10.0	12.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.8	37.1	28.7	20.0	20.1		13.0	23.7	14.0	10.0	12.5	
90th %ile Green (s)	12.0	12.0	12.0	11.5	27.0		36.0	36.0	36.0	36.0	36.0	
90th %ile Term Code	Max	Max	Max	Max	Hold		Max	Max	Max	Hold	Hold	
70th %ile Green (s)	12.0	12.0	12.0	11.5	27.0		36.0	36.0	36.0	36.0	36.0	
70th %ile Term Code	Max	Max	Max	Max	Hold		Max	Max	Max	Hold	Hold	
50th %ile Green (s)	11.3	11.3	11.3	11.5	26.3		36.0	36.0	36.0	36.0	36.0	
50th %ile Term Code	Gap	Gap	Gap	Max	Hold		Max	Max	Max	Hold	Hold	
30th %ile Green (s)	10.0	10.0	10.0	9.3	22.8		29.2	29.2	29.2	29.2	29.2	
30th %ile Term Code	Min	Min	Min	Gap	Hold		Gap	Gap	Gap	Hold	Hold	
10th %ile Green (s)	10.0	10.0	10.0	6.5	20.0		20.1	20.1	20.1	20.1	20.1	
10th %ile Term Code	Min	Min	Min	Gap	Hold		Gap	Gap	Gap	Hold	Hold	
Queue Length 50th (ft)	11	75	15	80	98		34	228	69	0	52	
Queue Length 95th (ft)	34	136	40	137	164		69	366	123	3	94	
Internal Link Dist (ft)		1331			1359			1042			304	
Turn Bay Length (ft)	150		150	300			150			150		
Base Capacity (vph)	189	326	271	499	732		612	977	809	214	917	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.15	0.53	0.13	0.50	0.39		0.22	0.67	0.32	0.00	0.22	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 68.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 75	
70th %ile Actuated Cycle: 75	
50th %ile Actuated Cycle: 74.3	
30th %ile Actuated Cycle: 64	
10th %ile Actuated Cycle: 52.1	

Splits and Phases: 360: Nobel Drive & Syene Road



HCM Signalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	155	65	225	255	1	120	585	460	1	120	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1702	1810	1506	1717	1808		1712	1810	1499	1716	1699	
Flt Permitted	0.59	1.00	1.00	0.49	1.00		0.63	1.00	1.00	0.22	1.00	
Satd. Flow (perm)	1049	1810	1506	893	1808		1134	1810	1499	397	1699	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	28	172	36	250	283	1	133	650	256	1	133	72
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	28	172	36	250	284	0	133	650	256	1	205	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Actuated Green, G (s)	11.2	11.2	11.2	24.7	24.7		31.1	31.1	31.1	31.1	31.1	
Effective Green, g (s)	11.2	11.2	11.2	24.7	24.7		31.1	31.1	31.1	31.1	31.1	
Actuated g/C Ratio	0.17	0.17	0.17	0.36	0.36		0.46	0.46	0.46	0.46	0.46	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	173	299	249	447	659		520	830	688	182	779	
v/s Ratio Prot		0.10		c0.08	0.16			c0.36			0.12	
v/s Ratio Perm	0.03		0.02	c0.12			0.12		0.17	0.00		
v/c Ratio	0.16	0.58	0.14	0.56	0.43		0.26	0.78	0.37	0.01	0.26	
Uniform Delay, d1	24.3	26.1	24.2	16.1	16.3		11.3	15.5	12.0	10.0	11.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.7	0.1	0.9	0.2		0.5	5.6	0.7	0.0	0.4	
Delay (s)	24.4	27.8	24.3	17.0	16.4		11.8	21.1	12.7	10.0	11.7	
Level of Service	C	C	C	B	B		B	C	B	A	B	
Approach Delay (s)		26.8			16.7			17.9			11.7	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	18.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	85.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
500: Irish Lane & CTH D (Fish Hatchery)

1/7/2009

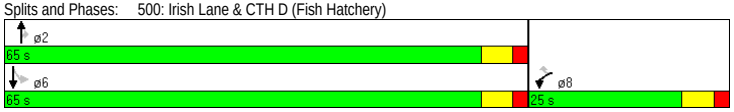
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	245	955	115	60	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	125		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.99	0.98		0.98	1.00	
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.248	
Satd. Flow (perm)	1707	1509	3438	1502	448	3438
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	50%	100%	50%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	50	136	1061	64	67	267
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	136	1061	64	67	267
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	21.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	65.0	65.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	59.0	59.0	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.20	0.62	0.43	0.06	0.21	0.11
Control Delay	34.4	48.2	6.1	4.5	7.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	48.2	6.1	4.5	7.7	5.2
90th %ile Green (s)	18.0	18.0	60.0	60.0	60.0	60.0
90th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
70th %ile Green (s)	14.7	14.7	63.3	63.3	63.3	63.3
70th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
50th %ile Green (s)	12.5	12.5	65.5	65.5	65.5	65.5
50th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
30th %ile Green (s)	10.1	10.1	67.9	67.9	67.9	67.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
10th %ile Green (s)	10.0	10.0	68.0	68.0	68.0	68.0
10th %ile Term Code	Min	Min	Coord	Coord	Coord	Coord
Queue Length 50th (ft)	26	74	104	9	21	38
Queue Length 95th (ft)	55	125	174	24	m24	36
Internal Link Dist (ft)	5775		1558			1595
Turn Bay Length (ft)		125		150	200	
Base Capacity (vph)	363	319	2481	1084	323	2481
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.43	0.43	0.06	0.21	0.11

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 35 (39%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 500: Irish Lane & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	245	955	115	60	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1504	3438	1502	1718	3438
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1719	1504	3438	1502	448	3438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	50%	100%	50%	100%	100%
Adj. Flow (vph)	50	136	1061	64	67	267
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	50	136	1061	64	67	267
Confl. Peds. (#/hr)	5	5		5	5	
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.1	13.1	64.9	64.9	64.9	64.9
Effective Green, g (s)	13.1	13.1	64.9	64.9	64.9	64.9
Actuated g/C Ratio	0.15	0.15	0.72	0.72	0.72	0.72
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	250	219	2479	1083	323	2479
v/s Ratio Prot	0.03		c0.31			0.08
v/s Ratio Perm		c0.09		0.04	0.15	
v/c Ratio	0.20	0.62	0.43	0.06	0.21	0.11
Uniform Delay, d1	33.8	36.1	5.1	3.7	4.1	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.17	1.22
Incremental Delay, d2	0.1	3.9	0.5	0.1	1.4	0.1
Delay (s)	34.0	40.0	5.6	3.8	6.2	4.7
Level of Service	C	D	A	A	A	A
Approach Delay (s)	38.4		5.5			5.0
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	215	1	1	245	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.918	
Flt Protected					0.981	
Satd. Flow (prot)	1808	0	0	1810	1630	0
Flt Permitted					0.981	
Satd. Flow (perm)	1808	0	0	1810	1630	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	239	1	1	272	11	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	240	0	0	273	28	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	215	1	1	245	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	239	1	1	272	11	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			240		514	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			240		514	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	98
cM capacity (veh/h)			1309		515	792

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	240	273	28
Volume Left	0	1	11
Volume Right	1	0	17
cSH	1700	1309	652
Volume to Capacity	0.14	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		23.7%	ICU Level of Service	A
Analysis Period (min)		15		

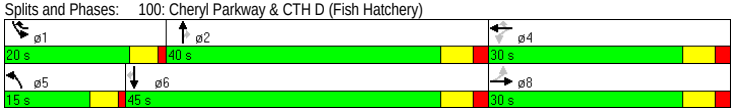
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	825	10	785	20	405	1195	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	200		0	110		200	350		200
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99	0.99		0.99		0.98	1.00		0.98	1.00		0.97
Frt		0.900				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1610	0	1719	1810	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.736			0.736			0.950			0.950		
Satd. Flow (perm)	1325	1610	0	1325	1810	1514	1713	3438	1514	3321	3438	1499
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		301			644			1411			1246	
Travel Time (s)		5.9			12.5			24.1			21.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	56	11	22	239	33	458	11	872	11	450	1328	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	33	0	239	33	458	11	872	11	450	1328	61
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Detector Phase	8	8		4	4	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	8.0	8.0	15.0	15.0	8.0	15.0	15.0
Minimum Split (s)	16.0	16.0		16.0	16.0	12.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	30.0	30.0	0.0	30.0	30.0	20.0	15.0	40.0	40.0	20.0	45.0	45.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	22.2%	16.7%	44.4%	44.4%	22.2%	50.0%	50.0%
Maximum Green (s)	24.0	24.0		24.0	24.0	15.5	10.5	34.0	34.0	15.5	39.0	39.0
Yellow Time (s)	4.0	4.0		4.0	4.0	3.5	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag						Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Volume
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	10.0	10.0		10.0	10.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	5.0	5.0		5.0	5.0	0.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.19	0.09		0.83	0.08	0.75	0.07	0.59	0.02	0.81	0.62	0.07
Control Delay	28.5	26.5		56.1	26.3	27.6	28.9	24.6	17.9	49.1	14.2	9.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	26.5		56.1	26.3	27.6	28.9	24.6	17.9	49.1	14.2	9.8
90th %ile Green (s)	24.0	24.0		24.0	24.0	15.5	8.0	34.0	34.0	15.5	41.5	41.5
90th %ile Term Code	Hold	Hold		Max	Max	Max	Min	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	23.9	23.9		23.9	23.9	15.6	0.0	34.0	34.0	15.6	54.1	54.1
70th %ile Term Code	Hold	Hold		Gap	Gap	Max	Skip	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	20.7	20.7		20.7	20.7	16.6	0.0	36.2	36.2	16.6	57.3	57.3
50th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	17.3	17.3		17.3	17.3	14.8	0.0	41.4	41.4	14.8	60.7	60.7
30th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	12.3	12.3		12.3	12.3	12.1	0.0	49.1	49.1	12.1	65.7	65.7
10th %ile Term Code	Hold	Hold		Gap	Gap	Gap	Skip	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	26	15		128	15	185	5	237	5	125	211	12
Queue Length 95th (ft)	56	37		#212	37	273	m12	326	m12	#195	431	41
Internal Link Dist (ft)		221			564			1331			1166	
Turn Bay Length (ft)	150			200			110		200	350		200
Base Capacity (vph)	353	429		353	483	625	201	1488	655	583	2134	930
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.08		0.68	0.07	0.73	0.05	0.59	0.02	0.77	0.62	0.07

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 100: Cheryl Parkway & CTH D (Fish Hatchery)



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HCM Signalized Intersection Capacity Analysis
100: Cheryl Parkway & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	20	215	30	825	10	785	20	405	1195	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1708	1608		1708	1810	1524	1719	3438	1514	3335	3438	1501
Flt Permitted	0.74	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1322	1608		1322	1810	1524	1719	3438	1514	3335	3438	1501
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	56	11	22	239	33	458	11	872	11	450	1328	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	56	33	0	239	33	458	11	872	11	450	1328	61
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm			Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		8			4	1	5	2		1	6	
Permitted Phases	8			4		4			2			6
Actuated Green, G (s)	19.6	19.6		19.6	19.6	34.5	1.6	39.0	39.0	14.9	52.3	52.3
Effective Green, g (s)	19.6	19.6		19.6	19.6	34.5	1.6	39.0	39.0	14.9	52.3	52.3
Actuated g/C Ratio	0.22	0.22		0.22	0.22	0.38	0.02	0.43	0.43	0.17	0.58	0.58
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)	288	350		288	394	584	31	1490	656	552	1998	872
v/s Ratio Prot		0.02			0.02	0.13	0.01	0.25		c0.13	c0.39	
v/s Ratio Perm	0.04			c0.18		0.17			0.01			0.04
v/c Ratio	0.19	0.09		0.83	0.08	0.78	0.35	0.59	0.02	0.82	0.66	0.07
Uniform Delay, d1	28.8	28.1		33.6	28.0	24.5	43.7	19.4	14.6	36.2	12.9	8.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.74	1.10	1.02	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0		16.9	0.0	6.3	2.3	1.6	0.0	8.6	1.8	0.2
Delay (s)	28.9	28.2		50.5	28.1	30.8	34.7	22.9	14.9	44.8	14.6	8.4
Level of Service	C	C		D	C	C	C	C	B	D	B	A
Approach Delay (s)		28.6			37.1			22.9			21.8	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	25.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

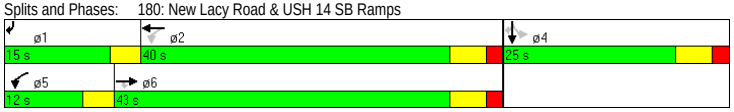
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1765	250	120	515	0	0	0	0	315	1	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	250		200	225		0	0		0	225		350
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.88
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950						0.950	0.953	
Satd. Flow (prot)	0	4940	1538	1719	3438	0	0	0	0	1633	1638	2707
Flt Permitted				0.092						0.950	0.953	
Satd. Flow (perm)	0	4940	1538	166	3438	0	0	0	0	1633	1638	2707
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1239			591			702			1088	
Travel Time (s)		24.1			11.5			16.0			24.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1961	139	133	572	0	0	0	0	350	1	633
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1961	139	133	572	0	0	0	0	175	176	633
Turn Type			Perm	pm+pt						Perm		custom
Protected Phases		6		5	2						4	1
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	1
Switch Phase												
Minimum Initial (s)		15.0	15.0	6.0	15.0					10.0	10.0	6.0
Minimum Split (s)		21.0	21.0	9.5	21.0					16.0	16.0	9.5
Total Split (s)	0.0	43.0	43.0	12.0	40.0	0.0	0.0	0.0	0.0	25.0	25.0	15.0
Total Split (%)	0.0%	53.8%	53.8%	15.0%	50.0%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	18.8%
Maximum Green (s)		37.0	37.0	8.5	34.0					19.0	19.0	11.5
Yellow Time (s)		4.0	4.0	3.5	4.0					4.0	4.0	3.5
All-Red Time (s)		2.0	2.0	0.0	2.0					2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	3.5	6.0	4.0	4.0	4.0	4.0	6.0	6.0	3.5
Lead/Lag		Lag	Lag	Lead	Lag							Lead
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Minimum Gap (s)		2.0	2.0	2.0	2.0					2.0	2.0	2.0

Volume
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min					None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.72	0.16	0.55	0.31					0.63	0.64	0.69
Control Delay		16.2	10.7	16.1	6.1					40.9	40.9	26.8
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		16.2	10.7	16.1	6.1					40.9	40.9	26.8
90th %ile Green (s)		37.0	37.0	8.5	37.4					19.0	19.0	8.1
90th %ile Term Code		Coord	Coord	Max	Coord					Max	Max	Gap
70th %ile Green (s)		42.1	42.1	7.2	41.2					15.2	15.2	8.1
70th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
50th %ile Green (s)		45.3	45.3	6.3	43.9					12.9	12.9	7.7
50th %ile Term Code		Coord	Coord	Gap	Coord					Gap	Gap	Gap
30th %ile Green (s)		47.9	47.9	6.0	46.6					10.6	10.6	7.3
30th %ile Term Code		Coord	Coord	Min	Coord					Gap	Gap	Gap
10th %ile Green (s)		48.5	48.5	6.0	48.5					10.0	10.0	6.0
10th %ile Term Code		Coord	Coord	Min	Coord					Min	Min	Min
Queue Length 50th (ft)		237	30	22	97					87	88	154
Queue Length 95th (ft)		375	74	m0	150					141	142	189
Internal Link Dist (ft)		1159			511			622			1008	
Turn Bay Length (ft)			200	225						225		350
Base Capacity (vph)		2727	849	278	1870					388	389	1050
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.72	0.16	0.48	0.31					0.45	0.45	0.60

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 180: New Lacy Road & USH 14 SB Ramps



HCM Signalized Intersection Capacity Analysis
180: New Lacy Road & USH 14 SB Ramps 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1765	250	120	515	0	0	0	0	315	1	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	3.5	6.0					6.0	6.0	3.5
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.95	0.88
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4940	1538	1719	3438					1633	1638	2707
Flt Permitted		1.00	1.00	0.09	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4940	1538	166	3438					1633	1638	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	74%
Adj. Flow (vph)	0	1961	139	133	572	0	0	0	0	350	1	633
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1961	139	133	572	0	0	0	0	175	176	633
Turn Type			Perm	pm+pt						Perm		custom
Protected Phases		6		5	2						4	1
Permitted Phases			6	2						4		4
Actuated Green, G (s)		44.2	44.2	50.4	43.6					13.5	13.5	20.9
Effective Green, g (s)		44.2	44.2	50.4	43.6					13.5	13.5	20.9
Actuated g/C Ratio		0.55	0.55	0.63	0.55					0.17	0.17	0.26
Clearance Time (s)		6.0	6.0	3.5	6.0					6.0	6.0	3.5
Vehicle Extension (s)		5.0	5.0	2.0	5.0					2.0	2.0	2.0
Lane Grp Cap (vph)		2729	850	237	1874					276	276	707
v/s Ratio Prot		c0.40		0.05	0.17							c0.08
v/s Ratio Perm			0.09	0.31						0.11	0.11	0.15
v/c Ratio		0.72	0.16	0.56	0.31					0.63	0.64	0.90
Uniform Delay, d1		13.3	8.8	9.5	9.9					31.0	31.0	28.5
Progression Factor		1.00	1.00	1.09	0.53					1.00	1.00	1.00
Incremental Delay, d2		1.7	0.4	1.2	0.3					3.5	3.5	13.6
Delay (s)		14.9	9.2	11.5	5.6					34.4	34.5	42.1
Level of Service		B	A	B	A					C	C	D
Approach Delay (s)		14.6			6.7			0.0			39.3	
Approach LOS		B			A			A			D	

Intersection Summary					
HCM Average Control Delay	19.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		7.0	
Intersection Capacity Utilization	70.9%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

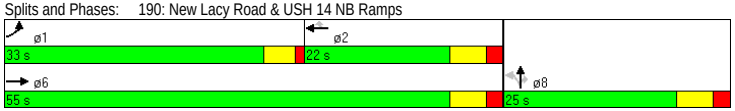
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1225	855	0	0	470	295	165	1	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		225	0		150	0		0
Storage Lanes	2		0	0		1	0		1	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3335	3438	0	0	3438	1538	0	1724	1538	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		591			1641			746			792	
Travel Time (s)		11.5			32.0			17.0			18.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1361	950	0	0	522	164	183	1	58	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1361	950	0	0	522	164	0	184	58	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Detector Phase	1	6			2	2	8	8	8			
Switch Phase												
Minimum Initial (s)	8.0	15.0			15.0	15.0	10.0	10.0	10.0			
Minimum Split (s)	12.5	21.0			21.0	21.0	16.0	16.0	16.0			
Total Split (s)	33.0	55.0	0.0	0.0	22.0	22.0	25.0	25.0	25.0	0.0	0.0	0.0
Total Split (%)	41.3%	68.8%	0.0%	0.0%	27.5%	27.5%	31.3%	31.3%	31.3%	0.0%	0.0%	0.0%
Maximum Green (s)	28.5	49.0			16.0	16.0	19.0	19.0	19.0			
Yellow Time (s)	3.5	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	1.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	4.0	4.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0			5.0	5.0	2.0	2.0	2.0			
Minimum Gap (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			

Volume
190: New Lacy Road & USH 14 NB Ramps 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.95	0.40			0.76	0.53		0.64	0.23			
Control Delay	23.5	2.5			38.7	36.0		41.0	29.7			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	23.5	2.5			38.7	36.0		41.0	29.7			
90th %ile Green (s)	29.4	49.9			16.0	16.0	18.1	18.1	18.1			
90th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
70th %ile Green (s)	32.4	52.9			16.0	16.0	15.1	15.1	15.1			
70th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
50th %ile Green (s)	34.6	55.1			16.0	16.0	12.9	12.9	12.9			
50th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
30th %ile Green (s)	36.8	57.3			16.0	16.0	10.7	10.7	10.7			
30th %ile Term Code	Max	Coord			Coord	Coord	Gap	Gap	Gap			
10th %ile Green (s)	37.8	58.0			15.7	15.7	10.0	10.0	10.0			
10th %ile Term Code	Max	Coord			Coord	Coord	Min	Min	Min			
Queue Length 50th (ft)	323	46			130	74		87	26			
Queue Length 95th (ft)	#497	31			#188	135		142	54			
Internal Link Dist (ft)		511			1561			666			712	
Turn Bay Length (ft)						225			150			
Base Capacity (vph)	1426	2348			688	308		409	365			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.95	0.40			0.76	0.53		0.45	0.16			

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 50 (63%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 190: New Lacy Road & USH 14 NB Ramps



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
190: New Lacy Road & USH 14 NB Ramps

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1225	855	0	0	470	295	165	1	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538		1724	1538			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538		1724	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	1361	950	0	0	522	164	183	1	58	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1361	950	0	0	522	164	0	184	58	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	1	6			2			8				
Permitted Phases						2	8		8			
Actuated Green, G (s)	34.2	54.6			15.9	15.9		13.4	13.4			
Effective Green, g (s)	34.2	54.6			15.9	15.9		13.4	13.4			
Actuated g/C Ratio	0.43	0.68			0.20	0.20		0.17	0.17			
Clearance Time (s)	4.5	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	2.0	5.0			5.0	5.0		2.0	2.0			
Lane Grp Cap (vph)	1426	2346			683	306		289	258			
v/s Ratio Prot	c0.41	0.28			c0.15							
v/s Ratio Perm						0.11		0.11	0.04			
v/c Ratio	0.95	0.40			0.76	0.54		0.64	0.22			
Uniform Delay, d1	22.1	5.6			30.3	28.7		31.0	28.8			
Progression Factor	0.35	0.34			1.00	1.00		1.00	1.00			
Incremental Delay, d2	10.7	0.4			7.9	6.6		3.4	0.2			
Delay (s)	18.4	2.3			38.2	35.3		34.4	29.0			
Level of Service	B	A			D	D		C	C			
Approach Delay (s)		11.8			37.5			33.1			0.0	
Approach LOS		B			D			C			A	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	235	185	180	505	190	235	545	75	285	885	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	130		150	155		150	100		175	150		150
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00		0.98	1.00		0.98	1.00		0.98
Frt		0.934				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	3184	0	1719	3438	1538	1719	3438	1538	1719	3438	1538
Flt Permitted	0.242			0.306			0.151			0.343		
Satd. Flow (perm)	437	3184	0	552	3438	1508	273	3438	1513	620	3438	1513
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1131			679			848			1411	
Travel Time (s)		22.0			13.2			14.5			24.1	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	261	206	200	561	106	261	606	42	317	983	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	467	0	200	561	106	261	606	42	317	983	158
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Detector Phase	3	8		7	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	9.5	16.0		9.5	16.0	16.0	9.5	21.0	21.0	9.5	21.0	21.0
Total Split (s)	12.0	24.0	0.0	12.0	24.0	24.0	18.0	36.0	36.0	18.0	36.0	36.0
Total Split (%)	13.3%	26.7%	0.0%	13.3%	26.7%	26.7%	20.0%	40.0%	40.0%	20.0%	40.0%	40.0%
Maximum Green (s)	8.5	18.0		8.5	18.0	18.0	14.5	30.0	30.0	14.5	30.0	30.0
Yellow Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	8.0	8.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

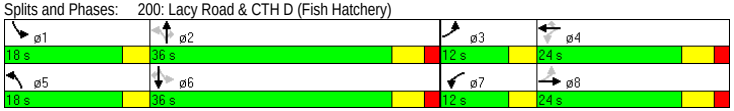
Volume
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	10.0		0.0	10.0	10.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0		0.0	10.0	10.0	0.0	10.0	10.0	0.0	10.0	10.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.51	0.80		0.71	0.86	0.37	0.77	0.47	0.07	0.65	0.76	0.28
Control Delay	28.1	46.2		37.7	49.3	35.5	31.1	21.4	19.9	16.5	27.2	17.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	46.2		37.7	49.3	35.5	31.1	21.4	19.9	16.5	27.2	17.9
90th %ile Green (s)	8.5	18.0		8.5	18.0	18.0	14.5	30.0	30.0	14.5	30.0	30.0
90th %ile Term Code	Max	Max		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	8.5	18.0		8.5	18.0	18.0	14.5	30.0	30.0	14.5	30.0	30.0
70th %ile Term Code	Max	Max		Max	Max	Max	Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	8.5	18.0		8.5	18.0	18.0	13.5	31.1	31.1	13.4	31.0	31.0
50th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	7.5	15.8		8.9	17.2	17.2	10.1	35.2	35.2	11.1	36.2	36.2
30th %ile Term Code	Gap	Hold		Max	Gap	Gap	Gap	Coord	Coord	Gap	Coord	Coord
10th %ile Green (s)	6.0	12.6		7.9	14.5	14.5	7.6	42.3	42.3	8.2	42.9	42.9
10th %ile Term Code	Min	Gap		Gap	Hold	Hold	Gap	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)	47	132		81	161	52	89	123	13	119	301	77
Queue Length 95th (ft)	87	186		#153	#240	101	#176	190	m37	86	#381	m71
Internal Link Dist (ft)		1051			599			768			1331	
Turn Bay Length (ft)	130			155		150	100		175	150		150
Base Capacity (vph)	255	637		284	688	302	385	1288	567	523	1300	572
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.73		0.70	0.82	0.35	0.68	0.47	0.07	0.61	0.76	0.28

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 200: Lacy Road & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	235	185	180	505	190	235	545	75	285	885	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	3182		1718	3438	1508	1719	3438	1514	1718	3438	1514
Flt Permitted	0.24	1.00		0.31	1.00	1.00	0.15	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	438	3182		553	3438	1508	272	3438	1514	620	3438	1514
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	122	261	206	200	561	106	261	606	42	317	983	158
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	467	0	200	561	106	261	606	42	317	983	158
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4		4	2		2	6		6
Actuated Green, G (s)	24.3	16.5		25.7	17.2	17.2	45.7	33.7	33.7	46.3	34.0	34.0
Effective Green, g (s)	24.3	16.5		25.7	17.2	17.2	45.7	33.7	33.7	46.3	34.0	34.0
Actuated g/C Ratio	0.27	0.18		0.29	0.19	0.19	0.51	0.37	0.37	0.51	0.38	0.38
Clearance Time (s)	3.5	6.0		3.5	6.0	6.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	8.0	8.0	2.0	5.0	5.0
Lane Grp Cap (vph)	229	583		268	657	288	331	1287	567	469	1299	572
v/s Ratio Prot	0.05	0.15		c0.07	c0.16		c0.11	0.18		0.09	0.29	
v/s Ratio Perm	0.10			0.14		0.07	c0.29		0.03	0.26		0.10
v/c Ratio	0.53	0.80		0.75	0.85	0.37	0.79	0.47	0.07	0.68	0.76	0.28
Uniform Delay, d1	26.2	35.2		26.3	35.2	31.7	15.8	21.4	18.1	13.4	24.4	19.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.05	0.89	0.96	1.07	0.91	0.79
Incremental Delay, d2	1.2	7.4		9.5	10.1	0.3	10.6	1.2	0.2	2.4	3.3	0.9
Delay (s)	27.4	42.5		35.8	45.3	32.0	27.1	20.3	17.6	16.7	25.5	16.3
Level of Service	C	D		D	D	C	C	C	B	B	C	B
Approach Delay (s)		39.4			41.5			22.1			22.6	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	29.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	76.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Volume
220: Lacy Road & Mica Road 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	385	20	215	395	25	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	125		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.895	
Flt Protected			0.950		0.989	
Satd. Flow (prot)	1810	1538	1719	1810	1602	0
Flt Permitted			0.950		0.989	
Satd. Flow (perm)	1810	1538	1719	1810	1602	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	2215			1462	1894	
Travel Time (s)	43.1			28.5	51.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	428	22	239	439	28	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	428	22	239	439	128	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
220: Lacy Road & Mica Road 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	385	20	215	395	25	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	428	22	239	439	28	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			450		1344	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			450		1344	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		78	84
cM capacity (veh/h)			1095		129	621

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	428	22	239	439	128
Volume Left	0	0	239	0	28
Volume Right	0	22	0	0	100
cSH	1700	1700	1095	1700	339
Volume to Capacity	0.25	0.01	0.22	0.26	0.38
Queue Length 95th (ft)	0	0	21	0	43
Control Delay (s)	0.0	0.0	9.2	0.0	21.9
Lane LOS			A		C
Approach Delay (s)	0.0		3.2		21.9
Approach LOS					C

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		49.1%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
240: Lacy Road & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	540	5	25	545	1	5	1	25	1	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850					0.892			0.879	
Flt Protected	0.950			0.950				0.992			0.997	
Satd. Flow (prot)	1719	1810	1538	1719	1810	0	0	1601	0	0	1586	0
Flt Permitted	0.950			0.950				0.992			0.997	
Satd. Flow (perm)	1719	1810	1538	1719	1810	0	0	1601	0	0	1586	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		735			2276			1136			454	
Travel Time (s)		14.3			44.3			31.0			12.4	
Confl. Peds. (#/hr)			5	5			5		5			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	600	6	28	606	1	6	1	28	1	1	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	600	6	28	607	0	0	35	0	0	19	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
240: Lacy Road & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	540	5	25	545	1	5	1	25	1	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	600	6	28	606	1	6	1	28	1	1	17
Pedestrians		5			5			5				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	607			611			1322	1301	610	1328	1306	611
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	607			611			1322	1301	610	1328	1306	611
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			95	99	94	99	99	97
cM capacity (veh/h)	957			950			120	151	485	117	150	486

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	17	600	6	28	607	34	19
Volume Left	17	0	0	28	0	6	1
Volume Right	0	0	6	0	1	28	17
cSH	957	1700	1700	950	1700	311	369
Volume to Capacity	0.02	0.35	0.00	0.03	0.36	0.11	0.05
Queue Length 95th (ft)	1	0	0	2	0	9	4
Control Delay (s)	8.8	0.0	0.0	8.9	0.0	18.0	15.3
Lane LOS	A			A		C	C
Approach Delay (s)	0.2			0.4		18.0	15.3
Approach LOS						C	C

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	40.8%	ICU Level of Service		A
Analysis Period (min)	15			

Volume
250: Lacy Road & Jones Farm Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	565	25	55	545	30	30	1	55	35	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		125	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994				0.850		0.913			0.939	
Flt Protected	0.950			0.950				0.983			0.974	
Satd. Flow (prot)	1719	1799	0	1719	1810	1538	0	1624	0	0	1655	0
Flt Permitted	0.950			0.950				0.983			0.974	
Satd. Flow (perm)	1719	1799	0	1719	1810	1538	0	1624	0	0	1655	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2276			991			251			275	
Travel Time (s)		44.3			19.3			6.8			7.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	628	28	61	606	33	33	1	61	39	1	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	656	0	61	606	33	0	95	0	0	73	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
250: Lacy Road & Jones Farm Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	565	25	55	545	30	30	1	55	35	1	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	628	28	61	606	33	33	1	61	39	1	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)					991							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	639			656			1448	1447	642	1462	1428	606
vC1, stage 1 conf vol							686	686		728	728	
vC2, stage 2 conf vol							762	761		734	700	
vCu, unblocked vol	538			656			1442	1441	642	1457	1419	501
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			87	100	87	83	100	93
cM capacity (veh/h)	909			918			261	285	469	234	281	505

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	22	656	61	606	33	96	73
Volume Left	22	0	61	0	0	33	39
Volume Right	0	28	0	0	33	61	33
cSH	909	1700	918	1700	1700	365	310
Volume to Capacity	0.02	0.39	0.07	0.36	0.02	0.26	0.24
Queue Length 95th (ft)	2	0	5	0	0	26	23
Control Delay (s)	9.1	0.0	9.2	0.0	0.0	18.3	20.2
Lane LOS	A		A			C	C
Approach Delay (s)	0.3		0.8			18.3	20.2
Approach LOS						C	C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	520	60	60	355	50	35	135	20	75	380	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		0	200		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00		0.98	1.00		0.97
Frt		0.984			0.981				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1776	0	1719	1769	0	1719	1810	1538	1719	1810	1538
Flt Permitted	0.308			0.361			0.317			0.662		
Satd. Flow (perm)	556	1776	0	652	1769	0	572	1810	1513	1194	1810	1496
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		991			753			1140			803	
Travel Time (s)		19.3			14.7			17.3			12.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	578	67	67	394	56	39	150	11	83	422	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	645	0	67	450	0	39	150	11	83	422	133
Turn Type	pm+pt			Perm			Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	1	6		2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0		15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.0		21.0	21.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	9.5	43.0	0.0	33.5	33.5	0.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	12.7%	57.3%	0.0%	44.7%	44.7%	0.0%	42.7%	42.7%	42.7%	42.7%	42.7%	42.7%
Maximum Green (s)	6.0	37.0		27.5	27.5		26.0	26.0	26.0	26.0	26.0	26.0
Yellow Time (s)	3.5	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0

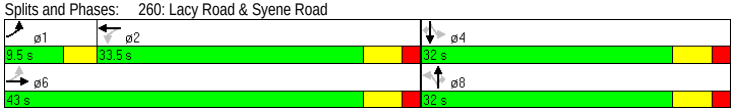
Volume
260: Lacy Road & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		Min	Min		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.20	0.74		0.27	0.67		0.23	0.27	0.02	0.23	0.77	0.29
Control Delay	9.2	19.5		19.7	24.1		21.2	19.1	16.5	19.3	30.9	19.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	19.5		19.7	24.1		21.2	19.1	16.5	19.3	30.9	19.7
90th %ile Green (s)	6.0	37.0		27.5	27.5		26.0	26.0	26.0	26.0	26.0	26.0
90th %ile Term Code	Max	Max		Max	Max		Hold	Hold	Hold	Max	Max	Max
70th %ile Green (s)	6.0	37.0		27.5	27.5		24.9	24.9	24.9	24.9	24.9	24.9
70th %ile Term Code	Max	Max		Max	Max		Hold	Hold	Hold	Gap	Gap	Gap
50th %ile Green (s)	6.0	34.0		24.5	24.5		19.8	19.8	19.8	19.8	19.8	19.8
50th %ile Term Code	Max	Hold		Gap	Gap		Hold	Hold	Hold	Gap	Gap	Gap
30th %ile Green (s)	6.0	28.8		19.3	19.3		15.3	15.3	15.3	15.3	15.3	15.3
30th %ile Term Code	Max	Hold		Gap	Gap		Hold	Hold	Hold	Gap	Gap	Gap
10th %ile Green (s)	0.0	16.7		16.7	16.7		10.0	10.0	10.0	10.0	10.0	10.0
10th %ile Term Code	Skip	Gap		Hold	Hold		Hold	Hold	Hold	Min	Min	Min
Queue Length 50th (ft)	14	182		18	148		12	46	3	25	153	41
Queue Length 95th (ft)	38	355		53	278		36	91	14	58	261	85
Internal Link Dist (ft)		911			673			1060			723	
Turn Bay Length (ft)	200			200			150		150	150		150
Base Capacity (vph)	417	1127		307	834		255	807	674	532	807	667
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.57		0.22	0.54		0.15	0.19	0.02	0.16	0.52	0.20

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 61.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 73.9
50th %ile Actuated Cycle: 65.8
30th %ile Actuated Cycle: 56.1
10th %ile Actuated Cycle: 38.7

Splits and Phases: 260: Lacy Road & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
260: Lacy Road & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	520	60	60	355	50	35	135	20	75	380	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1777		1715	1770		1713	1810	1512	1712	1810	1495
Flt Permitted	0.31	1.00		0.36	1.00		0.32	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	558	1777		651	1770		571	1810	1512	1192	1810	1495
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	83	578	67	67	394	56	39	150	11	83	422	133
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	83	645	0	67	450	0	39	150	11	83	422	133
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	pm+pt			Perm			Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	31.3	31.3		23.4	23.4		18.8	18.8	18.8	18.8	18.8	18.8
Effective Green, g (s)	31.3	31.3		23.4	23.4		18.8	18.8	18.8	18.8	18.8	18.8
Actuated g/C Ratio	0.50	0.50		0.38	0.38		0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	3.5	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	5.0		5.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	363	896		245	667		173	548	458	361	548	453
v/s Ratio Prot	0.02	c0.36			0.25			0.08			c0.23	
v/s Ratio Perm	0.10			0.10			0.07		0.01	0.07		0.09
v/c Ratio	0.23	0.72		0.27	0.67		0.23	0.27	0.02	0.23	0.77	0.29
Uniform Delay, d1	9.0	12.0		13.4	16.2		16.2	16.5	15.2	16.2	19.7	16.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	3.5		1.3	3.5		0.2	0.1	0.0	0.1	6.0	0.1
Delay (s)	9.1	15.5		14.7	19.7		16.4	16.6	15.2	16.3	25.7	16.7
Level of Service	A	B		B	B		B	B	B	B	C	B
Approach Delay (s)		14.7			19.0			16.5			22.6	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	18.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
300: Nobel Drive & CTH D (Fish Hatchery)

1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	10	330	10	510	10	375	135	210	1180	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		300	150		200	500		100
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00	0.98		0.99	0.98	1.00		0.97	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.954			0.954		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1726	1538	1719	3438	1538	1719	3438	1538
Flt Permitted		0.671			0.716		0.167			0.448		
Satd. Flow (perm)	0	1211	1511	0	1289	1511	302	3438	1499	809	3438	1501
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			50			50	
Link Distance (ft)		266			790			1394			1358	
Travel Time (s)		5.2			15.4			19.0			18.5	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	1	6	367	11	283	11	417	75	233	1311	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	6	0	378	283	11	417	75	233	1311	28
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	21.0	21.0	21.0	9.5	21.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	48.0	48.0	48.0	12.0	60.0	60.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	53.3%	53.3%	53.3%	13.3%	66.7%	66.7%
Maximum Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	42.0	42.0	42.0	8.5	54.0	54.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

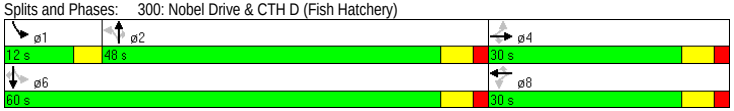
Volume
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.06	0.01		0.91	0.58	0.09	0.29	0.12	0.43	0.70	0.03
Control Delay		24.8	24.2		60.9	33.4	18.3	18.9	17.0	8.5	10.7	6.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		24.8	24.2		60.9	33.4	18.3	18.9	17.0	8.5	10.7	6.0
90th %ile Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	42.0	42.0	42.0	8.5	54.0	54.0
90th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	24.0	24.0	24.0	24.0	24.0	24.0	42.0	42.0	42.0	8.5	54.0	54.0
70th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	27.0	27.0	27.0	27.0	27.0	27.0	39.0	39.0	39.0	8.5	51.0	51.0
50th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	31.1	31.1	31.1	31.1	31.1	31.1	34.9	34.9	34.9	8.5	46.9	46.9
30th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Max	Coord	Coord
10th %ile Green (s)	38.3	38.3	38.3	38.3	38.3	38.3	28.5	28.5	28.5	7.7	39.7	39.7
10th %ile Term Code	Hold	Hold	Hold	Max	Max	Max	Coord	Coord	Coord	Gap	Coord	Coord
Queue Length 50th (ft)		9	2		212	138	3	70	22	44	135	5
Queue Length 95th (ft)		29	12		#418	#243	15	115	54	m59	156	m7
Internal Link Dist (ft)		186			710			1314			1278	
Turn Bay Length (ft)						300	150		200	500		100
Base Capacity (vph)		388	485		414	485	141	1604	700	550	2063	901
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.06	0.01		0.91	0.58	0.08	0.26	0.11	0.42	0.64	0.03

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 300: Nobel Drive & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
300: Nobel Drive & CTH D (Fish Hatchery) 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1	10	330	10	510	10	375	135	210	1180	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1723	1513		1718	1513	1718	3438	1498	1717	3438	1500
Flt Permitted		0.67	1.00		0.72	1.00	0.17	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1211	1513		1289	1513	302	3438	1498	810	3438	1500
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	22	1	6	367	11	283	11	417	75	233	1311	28
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	23	6	0	378	283	11	417	75	233	1311	28
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		28.9	28.9		28.9	28.9	37.3	37.3	37.3	49.1	49.1	49.1
Effective Green, g (s)		28.9	28.9		28.9	28.9	37.3	37.3	37.3	49.1	49.1	49.1
Actuated g/C Ratio		0.32	0.32		0.32	0.32	0.41	0.41	0.41	0.55	0.55	0.55
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
Lane Grp Cap (vph)		389	486		414	486	125	1425	621	526	1876	818
v/s Ratio Prot								0.12		0.04	c0.38	
v/s Ratio Perm		0.02	0.00		c0.29	0.19	0.04		0.05	0.20		0.02
v/c Ratio		0.06	0.01		0.91	0.58	0.09	0.29	0.12	0.44	0.70	0.03
Uniform Delay, d1		21.1	20.8		29.3	25.5	16.0	17.6	16.2	10.9	15.0	9.5
Progression Factor		1.00	1.00		1.00	1.00	1.17	1.08	1.13	0.77	0.62	0.75
Incremental Delay, d2		0.0	0.0		23.8	1.1	1.4	0.5	0.4	0.2	1.6	0.1
Delay (s)		21.2	20.8		53.1	26.7	20.1	19.5	18.7	8.5	10.9	7.2
Level of Service		C	C		D	C	C	B	B	A	B	A
Approach Delay (s)		21.1			41.8			19.4			10.5	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Volume
320: Nobel Drive & Mica Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	145	50	55	110	40	185	35	155	105	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		75	0		75
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.960				0.850			0.850
Flt Protected	0.950			0.950				0.960			0.956	
Satd. Flow (prot)	1719	1739	0	1719	1737	0	0	1737	1538	0	1730	1538
Flt Permitted	0.950			0.950				0.960			0.956	
Satd. Flow (perm)	1719	1739	0	1719	1737	0	0	1737	1538	0	1730	1538
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		972			1490			505			1894	
Travel Time (s)		18.9			29.0			13.8			51.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	161	56	61	122	44	206	39	172	117	11	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	217	0	61	166	0	0	245	172	0	128	133
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Nobel Drive & Mica Road 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	35	145	50	55	110	40	185	35	155	105	10	120
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	161	56	61	122	44	206	39	172	117	11	133

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	39	217	61	167	244	172	128	133
Volume Left (vph)	39	0	61	0	206	0	117	0
Volume Right (vph)	0	56	0	44	0	172	0	133
Hadj (s)	0.58	-0.09	0.58	-0.10	0.51	-0.61	0.54	-0.61
Departure Headway (s)	7.3	6.6	7.4	6.7	6.9	5.8	7.2	6.0
Degree Utilization, x	0.08	0.40	0.13	0.31	0.47	0.28	0.25	0.22
Capacity (veh/h)	460	513	457	506	494	592	474	561
Control Delay (s)	9.8	12.8	10.2	11.5	14.6	9.8	11.4	9.5
Approach Delay (s)	12.3		11.1		12.6		10.4	
Approach LOS	B		B		B		B	

Intersection Summary					
Delay	11.8				
HCM Level of Service	B				
Intersection Capacity Utilization	42.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Volume
330: Nobel Drive & Fahey Glen 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	345	20	60	165	10	20	30	115	20	15	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.991			0.906			0.951	
Flt Protected	0.950			0.950				0.994			0.982	
Satd. Flow (prot)	1719	1795	0	1719	1793	0	0	1630	0	0	1690	0
Flt Permitted	0.950			0.950				0.994			0.982	
Satd. Flow (perm)	1719	1795	0	1719	1793	0	0	1630	0	0	1690	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1490			506			842			580	
Travel Time (s)		29.0			9.9			16.4			11.3	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	383	22	67	183	11	22	33	128	22	17	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	405	0	67	194	0	0	183	0	0	61	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
330: Nobel Drive & Fahey Glen 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	345	20	60	165	10	20	30	115	20	15	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	383	22	67	183	11	22	33	128	22	17	22
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	199			411			841	821	404	949	827	199
vC1, stage 1 conf vol							488	488		327	327	
vC2, stage 2 conf vol							352	333		622	499	
vCu, unblocked vol	199			411			841	821	404	949	827	199
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			95	92	80	91	96	97
cM capacity (veh/h)	1349			1128			429	440	634	261	413	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	44	406	67	194	183	61
Volume Left	44	0	67	0	22	22
Volume Right	0	22	0	11	128	22
cSH	1349	1700	1128	1700	557	401
Volume to Capacity	0.03	0.24	0.06	0.11	0.33	0.15
Queue Length 95th (ft)	3	0	5	0	36	13
Control Delay (s)	7.8	0.0	8.4	0.0	14.6	15.6
Lane LOS	A		A		B	C
Approach Delay (s)	0.8		2.1		14.6	15.6
Approach LOS					B	C

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
340: Nobel Drive & Notre Dame Drive 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	380	55	30	165	25	45	10	25	15	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.980			0.958			0.932	
Flt Protected	0.950			0.950				0.973			0.985	
Satd. Flow (prot)	1719	1775	0	1719	1773	0	0	1687	0	0	1661	0
Flt Permitted	0.950			0.950				0.973			0.985	
Satd. Flow (perm)	1719	1775	0	1719	1773	0	0	1687	0	0	1661	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		621			590			515			463	
Travel Time (s)		12.1			11.5			14.0			12.6	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	50	422	61	33	183	28	50	11	28	17	11	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	483	0	33	211	0	0	89	0	0	56	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
340: Nobel Drive & Notre Dame Drive 1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	380	55	30	165	25	45	10	25	15	10	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	422	61	33	183	28	50	11	28	17	11	28
Pedestrians		5			5			5			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216			488			846	841	463	829	857	207
vC1, stage 1 conf vol							558	558		269	269	
vC2, stage 2 conf vol							288	283		561	588	
vCu, unblocked vol	216			488			846	841	463	829	857	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			88	97	95	96	97	97
cM capacity (veh/h)	1330			1055			426	432	588	394	408	819

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	483	33	211	89	56
Volume Left	50	0	33	0	50	17
Volume Right	0	61	0	28	28	28
cSH	1330	1700	1055	1700	467	537
Volume to Capacity	0.04	0.28	0.03	0.12	0.19	0.10
Queue Length 95th (ft)	3	0	2	0	17	9
Control Delay (s)	7.8	0.0	8.5	0.0	14.5	12.5
Lane LOS	A		A		B	B
Approach Delay (s)	0.7		1.2		14.5	12.5
Approach LOS					B	B

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			

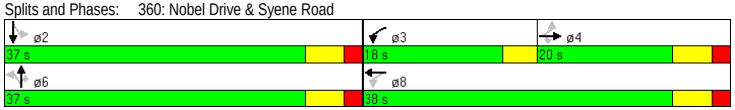
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	250	110	375	160	1	55	125	90	1	480	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	300		0	150		0	150		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	100		100	100		100	100		100	100		100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.98	1.00	1.00		1.00		0.97	1.00	1.00	
Frt			0.850		0.999				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1810	1538	1719	1807	0	1719	1810	1538	1719	1791	0
Flt Permitted	0.644			0.313			0.226			0.668		
Satd. Flow (perm)	1153	1810	1508	565	1807	0	408	1810	1498	1203	1791	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1411			1439			1122			384	
Travel Time (s)		27.5			28.0			17.0			5.8	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	67	278	61	417	178	1	61	139	50	1	533	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	278	61	417	179	0	61	139	50	1	566	0
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Detector Phase	4	4	4	3	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0		15.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	16.0	16.0	16.0	9.5	16.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	20.0	20.0	20.0	18.0	38.0	0.0	37.0	37.0	37.0	37.0	37.0	0.0
Total Split (%)	26.7%	26.7%	26.7%	24.0%	50.7%	0.0%	49.3%	49.3%	49.3%	49.3%	49.3%	0.0%
Maximum Green (s)	14.0	14.0	14.0	14.5	32.0		31.0	31.0	31.0	31.0	31.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	

Volume
360: Nobel Drive & Syene Road 1/7/2009

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	None	None	None	None		Min	Min	Min	Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.31	0.82	0.21	0.84	0.23		0.38	0.20	0.09	0.00	0.81	
Control Delay	30.6	49.5	27.9	32.1	14.2		24.0	15.1	14.0	13.0	30.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	30.6	49.5	27.9	32.1	14.2		24.0	15.1	14.0	13.0	30.3	
90th %ile Green (s)	14.0	14.0	14.0	14.5	32.0		31.0	31.0	31.0	31.0	31.0	
90th %ile Term Code	Max	Max	Max	Max	Hold		Hold	Hold	Hold	Max	Max	
70th %ile Green (s)	14.0	14.0	14.0	14.5	32.0		31.0	31.0	31.0	31.0	31.0	
70th %ile Term Code	Max	Max	Max	Max	Hold		Hold	Hold	Hold	Max	Max	
50th %ile Green (s)	14.0	14.0	14.0	14.5	32.0		31.0	31.0	31.0	31.0	31.0	
50th %ile Term Code	Max	Max	Max	Max	Hold		Hold	Hold	Hold	Max	Max	
30th %ile Green (s)	13.8	13.8	13.8	14.5	31.8		26.0	26.0	26.0	26.0	26.0	
30th %ile Term Code	Gap	Gap	Gap	Max	Hold		Hold	Hold	Hold	Gap	Gap	
10th %ile Green (s)	10.0	10.0	10.0	11.1	24.6		17.8	17.8	17.8	17.8	17.8	
10th %ile Term Code	Min	Min	Min	Gap	Hold		Hold	Hold	Hold	Gap	Gap	
Queue Length 50th (ft)	27	125	24	132	51		19	40	14	0	219	
Queue Length 95th (ft)	63	#249	57	#263	92		53	75	34	3	#353	
Internal Link Dist (ft)		1331			1359			1042			304	
Turn Bay Length (ft)	150		150	300			150			150		
Base Capacity (vph)	235	369	307	511	841		184	816	675	542	807	
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio	0.29	0.75	0.20	0.82	0.21		0.33	0.17	0.07	0.00	0.70	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 69.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
90th %ile Actuated Cycle: 75	
70th %ile Actuated Cycle: 75	
50th %ile Actuated Cycle: 75	
30th %ile Actuated Cycle: 69.8	
10th %ile Actuated Cycle: 54.4	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 360: Nobel Drive & Syene Road



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Traffic Analysis & Design, Inc.

HCM Signalized Intersection Capacity Analysis
360: Nobel Drive & Syene Road

1/7/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	250	110	375	160	1	55	125	90	1	480	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1701	1810	1508	1718	1808		1715	1810	1498	1710	1791	
Flt Permitted	0.64	1.00	1.00	0.31	1.00		0.23	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	1154	1810	1508	566	1808		408	1810	1498	1203	1791	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	50%	100%	100%	100%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	67	278	61	417	178	1	61	139	50	1	533	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	67	278	61	417	179	0	61	139	50	1	566	0
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		
Protected Phases		4		3	8			6			2	
Permitted Phases	4		4	8			6		6	2		
Actuated Green, G (s)	13.2	13.2	13.2	30.6	30.6		27.1	27.1	27.1	27.1	27.1	
Effective Green, g (s)	13.2	13.2	13.2	30.6	30.6		27.1	27.1	27.1	27.1	27.1	
Actuated g/C Ratio	0.19	0.19	0.19	0.44	0.44		0.39	0.39	0.39	0.39	0.39	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	219	343	286	478	794		159	704	582	468	696	
v/s Ratio Prot		0.15		c0.17	0.10			0.08			c0.32	
v/s Ratio Perm	0.06		0.04	c0.21			0.15		0.03	0.00		
v/c Ratio	0.31	0.81	0.21	0.87	0.23		0.38	0.20	0.09	0.00	0.81	
Uniform Delay, d1	24.3	27.1	23.9	15.2	12.2		15.3	14.1	13.5	13.0	19.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	12.8	0.1	15.5	0.1		3.2	0.3	0.1	0.0	8.1	
Delay (s)	24.6	39.9	24.0	30.7	12.2		18.5	14.4	13.6	13.0	27.2	
Level of Service	C	D	C	C	B		B	B	B	B	C	
Approach Delay (s)		35.0			25.2			15.2			27.1	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	26.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	9.5	
Intersection Capacity Utilization	91.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Volume
500: Irish Lane & CTH D (Fish Hatchery)

1/7/2009

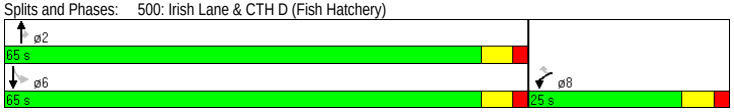
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	90	340	50	245	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	125		150	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100	100		100	100	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.99	0.98		0.98	1.00	
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Flt Permitted	0.950				0.528	
Satd. Flow (perm)	1707	1509	3438	1502	953	3438
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		50			50
Link Distance (ft)	5855		1638			1675
Travel Time (s)	88.7		22.3			22.8
Confl. Peds. (#/hr)	5	5		5	5	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	50%	100%	50%	50%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	133	50	378	28	136	1106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	50	378	28	136	1106
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	16.0	16.0	21.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	65.0	65.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%	72.2%	72.2%
Maximum Green (s)	19.0	19.0	59.0	59.0	59.0	59.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0

Volume
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.57	0.25	0.15	0.03	0.20	0.44
Control Delay	46.1	36.9	4.1	4.0	4.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	36.9	4.1	4.0	4.9	5.9
90th %ile Green (s)	16.1	16.1	61.9	61.9	61.9	61.9
90th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
70th %ile Green (s)	13.3	13.3	64.7	64.7	64.7	64.7
70th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
50th %ile Green (s)	11.3	11.3	66.7	66.7	66.7	66.7
50th %ile Term Code	Gap	Gap	Coord	Coord	Coord	Coord
30th %ile Green (s)	10.0	10.0	68.0	68.0	68.0	68.0
30th %ile Term Code	Min	Min	Coord	Coord	Coord	Coord
10th %ile Green (s)	10.0	10.0	68.0	68.0	68.0	68.0
10th %ile Term Code	Min	Min	Coord	Coord	Coord	Coord
Queue Length 50th (ft)	73	26	26	3	31	134
Queue Length 95th (ft)	124	57	49	12	m19	m76
Internal Link Dist (ft)	5775		1558			1595
Turn Bay Length (ft)		125		150	200	
Base Capacity (vph)	363	319	2516	1099	697	2516
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.16	0.15	0.03	0.20	0.44

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 500: Irish Lane & CTH D (Fish Hatchery)



HCM Signalized Intersection Capacity Analysis
500: Irish Lane & CTH D (Fish Hatchery) 1/7/2009

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	90	340	50	245	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1503	3438	1502	1716	3438
Flt Permitted	0.95	1.00	1.00	1.00	0.53	1.00
Satd. Flow (perm)	1719	1503	3438	1502	953	3438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	50%	100%	50%	50%	100%
Adj. Flow (vph)	133	50	378	28	136	1106
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	133	50	378	28	136	1106
Confl. Peds. (#/hr)	5	5		5	5	
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.1	12.1	65.9	65.9	65.9	65.9
Effective Green, g (s)	12.1	12.1	65.9	65.9	65.9	65.9
Actuated g/C Ratio	0.13	0.13	0.73	0.73	0.73	0.73
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	231	202	2517	1100	698	2517
v/s Ratio Prot	c0.08		0.11			c0.32
v/s Ratio Perm		0.03		0.02	0.14	
v/c Ratio	0.58	0.25	0.15	0.03	0.19	0.44
Uniform Delay, d1	36.5	34.9	3.6	3.3	3.8	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.02	1.07
Incremental Delay, d2	2.2	0.2	0.1	0.0	0.4	0.4
Delay (s)	38.7	35.1	3.8	3.3	4.3	5.5
Level of Service	D	D	A	A	A	A
Approach Delay (s)	37.7		3.7			5.3
Approach LOS	D		A			A

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Volume
550: Irish Lane & East Hill 1/7/2009

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	230	10	25	220	1	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		100	100		100	100
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.994				0.876	
Flt Protected				0.995	0.996	
Satd. Flow (prot)	1799	0	0	1800	1579	0
Flt Permitted				0.995	0.996	
Satd. Flow (perm)	1799	0	0	1800	1579	0
Link Speed (mph)	45			55	25	
Link Distance (ft)	1828			863	780	
Travel Time (s)	27.7			10.7	21.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	256	11	28	244	1	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	0	0	272	12	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
550: Irish Lane & East Hill 1/7/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	230	10	25	220	1	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	256	11	28	244	1	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			267		561	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		561	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	99
cM capacity (veh/h)			1280		473	770

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	267	272	12
Volume Left	0	28	1
Volume Right	11	0	11
cSH	1700	1280	729
Volume to Capacity	0.16	0.02	0.02
Queue Length 95th (ft)	0	2	1
Control Delay (s)	0.0	1.0	10.0
Lane LOS		A	B
Approach Delay (s)	0.0	1.0	10.0
Approach LOS			B

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		39.0%	ICU Level of Service	A
Analysis Period (min)		15		

AWSC Queues - 2035 Build Traffic, With Improvements

Calculations from Equation 17-37 of HCM2000 (pg. 17-23); Assumes 25-foot vehicle length

T = 0.25

Nobel Drive & Mica Road

AM	EBL	EBTR	WBL	WBTR	NBLT	NBR	SBLT	SBR
v,x	161	367	217	317	56	44	72	28
cm,x	540	646	548	631	441	508	448	508
vx/cmx	0.30	0.57	0.40	0.50	0.13	0.09	0.16	0.06
vx/cx - 1	-0.70	-0.43	-0.60	-0.50	-0.87	-0.91	-0.84	-0.94
95th %-ile Queue (veh):	1	4	2	3	0	0	1	0
95th %-ile Queue (feet):	31	89	47	71	11	7	14	4

PM	EBL	EBTR	WBL	WBTR	NBLT	NBR	SBLT	SBR
v,x	39	217	61	167	244	172	128	133
cm,x	460	513	457	506	494	592	474	561
vx/cmx	0.08	0.42	0.13	0.33	0.49	0.29	0.27	0.24
vx/cx - 1	-0.92	-0.58	-0.87	-0.67	-0.51	-0.71	-0.73	-0.76
95th %-ile Queue (veh):	0	2	0	1	3	1	1	1
95th %-ile Queue (feet):	7	52	11	36	67	30	27	23

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/FAHEY GLEN                  14 *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90 *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15 *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75 *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00 *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75 *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   10  410    1  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   35    5   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*    5  495   45  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    5   25   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     421     50    545     50       * AVEDEL  s   6.8 *
* CAPACITY    veh     976    786   1018    719       * LOS   SIG     A *
* AVE DELAY  mins    0.11   0.08   0.13   0.09       * LOS UNSIG     A *
* MAX DELAY  mins    0.14   0.10   0.17   0.12       *                  *
* AVE QUEUE   veh       1      0      1      0       * VEHIC HRS   2.0 *
* MAX QUEUE   veh       1      0      1      0       * COST    $    30 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/FAHEY GLEN                  15 *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90 *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15 *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75 *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00 *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75 *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   10  510    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   40   25   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  505   35  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    1    5   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     525     75    565     16       * AVEDEL  s   7.6 *
* CAPACITY    veh     999    733   1004    719       * LOS   SIG     A *
* AVE DELAY  mins    0.12   0.09   0.14   0.08       * LOS UNSIG     A *
* MAX DELAY  mins    0.17   0.12   0.19   0.11       *                  *
* AVE QUEUE   veh       1      0      1      0       * VEHIC HRS   2.5 *
* MAX QUEUE   veh       1      0      2      0       * COST    $    38 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/FAHEY GLEN                  16 *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90 *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15 *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75 *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00 *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75 *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   10  410    1  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   35    5   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*    5  495   45  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    5   25   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     421     50    545     50       * AVEDEL  s   4.9 *
* CAPACITY    veh    1173    983   1215    916       * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.06   0.09   0.07       * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.08   0.12   0.09       *                  *
* AVE QUEUE   veh       1      0      1      0       * VEHIC HRS   1.5 *
* MAX QUEUE   veh       1      0      1      0       * COST    $    22 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/FAHEY GLEN                  17 *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90 *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15 *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75 *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00 *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75 *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   10  510    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   40   25   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  505   35  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB FAHEY *1.05*    1    5   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     525     75    565     16       * AVEDEL  s   5.3 *
* CAPACITY    veh    1196    930   1201    916       * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.07   0.09   0.07       * LOS UNSIG     A *
* MAX DELAY  mins    0.12   0.09   0.13   0.08       *                  *
* AVE QUEUE   veh       1      0      1      0       * VEHIC HRS   1.7 *
* MAX QUEUE   veh       1      0      1      0       * COST    $    26 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/SYENE                       19  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   7.31          * TIME PERIOD     min    90  *
* L'   (m)   60.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*    5  165   90  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  295  275   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  160  700   80  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  330  160   65  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     260    595    940    555          * AVEDEL  s   7.0 *
* CAPACITY    veh    1552    857   1812   1156          * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.24   0.07   0.10          * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.37   0.10   0.15          *                  *
* AVE QUEUE   veh       0      2      1      1          * VEHIC HRS   4.6 *
* MAX QUEUE   veh       0      3      1      1          * COST    $    69 *
*                                                        *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/SYENE                       20  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   7.31          * TIME PERIOD     min    90  *
* L'   (m)   60.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   25  685  365  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   80  175    5  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   75  170  370  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   95  300  185  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh    1075    260    615    580          * AVEDEL  s  33.0 *
* CAPACITY    veh    1179    373   1697   1329          * LOS   SIG     C *
* AVE DELAY  mins    1.08   0.57   0.05   0.08          * LOS UNSIG     D *
* MAX DELAY  mins    2.37   1.02   0.07   0.11          *                  *
* AVE QUEUE   veh      20      3      1      1          * VEHIC HRS  23.2 *
* MAX QUEUE   veh      45      4      1      1          * COST    $   348 *
*                                                        *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/SYENE                       22  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   7.31          * TIME PERIOD     min    90  *
* L'   (m)   60.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*    5  165   90  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*  295  275   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*  160  700   80  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  330  160   65  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     260    595    940    555          * AVEDEL  s   4.7 *
* CAPACITY    veh    1749   1054   2009   1353          * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.13   0.06   0.08          * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.19   0.08   0.11          *                  *
* AVE QUEUE   veh       0      1      1      1          * VEHIC HRS   3.0 *
* MAX QUEUE   veh       0      2      1      1          * COST    $    46 *
*                                                        *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/SYENE                       23  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.31   4.27   7.92   7.31          * TIME PERIOD     min    90  *
* L'   (m)   60.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   7.31   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   25  685  365  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*   80  175    5  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   75  170  370  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   95  300  185  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh    1075    260    615    580          * AVEDEL  s   9.4 *
* CAPACITY    veh    1376    570   1893   1526          * LOS   SIG     A *
* AVE DELAY  mins    0.26   0.20   0.05   0.06          * LOS UNSIG     A *
* MAX DELAY  mins    0.47   0.32   0.06   0.09          *                  *
* AVE QUEUE   veh       5      1      0      1          * VEHIC HRS   6.6 *
* MAX QUEUE   veh       8      1      1      1          * COST    $    99 *
*                                                        *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09               2035 BUILD - CHERYL/NEW LACY                     44  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   7.31   8.53           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*  105  420    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  765   65    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  875 1145    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     525    830   2020                 * AVEDEL  s  21.8 *
* CAPACITY    veh    1249   1509   2206                 * LOS   SIG     C *
* AVE DELAY  mins    0.08   0.09   0.55                 * LOS UNSIG     C *
* MAX DELAY  mins    0.12   0.13   1.21                 *                     *
* AVE QUEUE   veh       1      1     19                 * VEHIC HRS  20.4 *
* MAX QUEUE   veh       1      2     39                 * COST    $   307 *
*                                                       *                     *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09               2035 BUILD - CHERYL/NEW LACY                     45  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   7.31   8.53           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   60  890    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  970   90    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  525  670    0            *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                       *                     *
* FLOW        veh     950   1060   1195                 * AVEDEL  s  21.2 *
* CAPACITY    veh    1602   1187   2187                 * LOS   SIG     C *
* AVE DELAY  mins    0.09   0.92   0.06                 * LOS UNSIG     C *
* MAX DELAY  mins    0.14   2.01   0.08                 *                     *
* AVE QUEUE   veh       2     16      1                 * VEHIC HRS  18.9 *
* MAX QUEUE   veh       2     36      2                 * COST    $   283 *
*                                                       *                     *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09               2035 BUILD - CHERYL/NEW LACY                    46  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   7.31   8.53           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    AM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*  105  420    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  765   65    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  875 1145    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     525    830   2020              * AVEDEL  s   8.8 *
* CAPACITY    veh    1445   1706   2403              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.07   0.20              * LOS UNSIG     A *
* MAX DELAY  mins    0.09   0.10   0.36              *                        *
* AVE QUEUE   veh       1      1      7              * VEHIC HRS   8.2 *
* MAX QUEUE   veh       1      1     11              * COST    $   123 *
*                                                    *                        *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09               2035 BUILD - CHERYL/NEW LACY                    47  *
*                                                                             *
*******************************************************************************
*                                          *                                  *
* E    (m)    7.92   7.31   8.53           * TIME PERIOD     min    90  *
* L'   (m)   40.00  80.00  40.00           * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   7.31           * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  25.00  25.00           * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00           * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00           * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0           * FLOW PEAK  am/op/pm    PM  *
*                                          *                                  *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                         *    *  *               *         *
* EB CHERYL*1.05*   60  890    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NEWLCY*1.05*  970   90    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  525  670    0            *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*          *    *                         *    *  *               *         *
*******************************************************************************
*                                                    *                        *
* FLOW        veh     950   1060   1195              * AVEDEL  s   7.0 *
* CAPACITY    veh    1799   1384   2384              * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.23   0.05              * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.42   0.07              *                        *
* AVE QUEUE   veh       1      4      1              * VEHIC HRS   6.3 *
* MAX QUEUE   veh       1      7      1              * COST    $    94 *
*                                                    *                        *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   5:2:09                2035 BUILD - IRISH/SYENE                  29  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   7.92   4.27   7.92     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  25.00  20.00  25.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*   35   50  145  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  865  110  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*  155   80   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   55  295   60  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     230    976    245    410      * AVEDEL  s   7.3 *
* CAPACITY    veh     833   1619    433   1657      * LOS   SIG     A *
* AVE DELAY  mins    0.10   0.09   0.38   0.05      * LOS UNSIG     A *
* MAX DELAY  mins    0.13   0.14   0.65   0.06      *                  *
* AVE QUEUE   veh       0      2      2      0      * VEHIC HRS   3.8 *
* MAX QUEUE   veh       0      2      2      0      * COST    $    57 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   5:2:09                2035 BUILD - IRISH/SYENE                  30  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   7.92   4.27   7.92     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  25.00  20.00  25.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB IRISH *1.05*  125   75   40  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  175   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   55   50   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  145  680  140  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     240    226    115    965      * AVEDEL  s   5.3 *
* CAPACITY    veh     587   1619    886   1719      * LOS   SIG     A *
* AVE DELAY  mins    0.18   0.04   0.08   0.08      * LOS UNSIG     A *
* MAX DELAY  mins    0.26   0.05   0.10   0.11      *                  *
* AVE QUEUE   veh       1      0      0      1      * VEHIC HRS   2.3 *
* MAX QUEUE   veh       1      0      0      2      * COST    $    34 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   5:2:09                 2035 BUILD - IRISH/SYENE                       31  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   7.92   4.27   7.92          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  25.00  20.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*   35   50  145  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  865  110  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*  155   80   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*   55  295   60  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     230    976    245    410          * AVEDEL  s   4.6 *
* CAPACITY    veh    1030   1816    630   1854          * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.07   0.16   0.04          * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.10   0.24   0.05          *                  *
* AVE QUEUE   veh       0      1      1      0          * VEHIC HRS   2.4 *
* MAX QUEUE   veh       0      1      1      0          * COST    $    36 *
*                                                        *                    *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   5:2:09                 2035 BUILD - IRISH/SYENE                       32  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   7.92   4.27   7.92          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  25.00  20.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB IRISH *1.05*  125   75   40  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB SYENE *1.05*    1  175   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB IRISH *1.05*   55   50   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB SYENE *1.05*  145  680  140  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     240    226    115    965          * AVEDEL  s   4.0 *
* CAPACITY    veh     784   1816   1083   1916          * LOS   SIG     A *
* AVE DELAY  mins    0.11   0.04   0.06   0.06          * LOS UNSIG     A *
* MAX DELAY  mins    0.15   0.05   0.08   0.09          *                  *
* AVE QUEUE   veh       0      0      0      1          * VEHIC HRS   1.7 *
* MAX QUEUE   veh       1      0      0      1          * COST    $    25 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09             2035 BUILD - CHERYL/RESEARCH PARK                  20  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   70  650  145  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   20   25   40  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   30  265    5  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   30    5   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     865     85    300     50           * AVEDEL  s   3.2 *
* CAPACITY    veh    2084    597   1552    862           * LOS   SIG     A *
* AVE DELAY  mins    0.05   0.12   0.05   0.07           * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.16   0.06   0.09           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   1.2 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    17 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09             2035 BUILD - CHERYL/RESEARCH PARK                  21  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   35  390  105  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   15   10  160  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  765   25  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  205   30   65  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     530    185    805    300           * AVEDEL  s   6.5 *
* CAPACITY    veh    2013    730   1509    523           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.11   0.09   0.30           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.15   0.12   0.48           *                  *
* AVE QUEUE   veh       0      0      1      2           * VEHIC HRS   3.3 *
* MAX QUEUE   veh       0      0      1      2           * COST    $    50 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09             2035 BUILD - CHERYL/RESEARCH PARK                  22  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   70  650  145  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   20   25   40  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   30  265    5  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   30    5   15  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     865     85    300     50           * AVEDEL  s   2.7 *
* CAPACITY    veh    2281    795   1749   1059           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.08   0.04   0.06           * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.11   0.05   0.07           *                  *
* AVE QUEUE   veh       1      0      0      0           * VEHIC HRS   1.0 *
* MAX QUEUE   veh       1      0      0      0           * COST    $    15 *
*                                                        *                    *
*******************************************************************************



*******************************************************************************
*                                                                             *
*   9:1:09             2035 BUILD - CHERYL/RESEARCH PARK                  23  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   7.31   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  25.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB CHERYL*1.05*   35  390  105  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   15   10  160  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB CHERYL*1.05*   15  765   25  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  205   30   65  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     530    185    805    300           * AVEDEL  s   4.3 *
* CAPACITY    veh    2210    927   1706    720           * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.08   0.07   0.14           * LOS UNSIG     A *
* MAX DELAY  mins    0.05   0.11   0.09   0.21           *                  *
* AVE QUEUE   veh       0      0      1      1           * VEHIC HRS   2.2 *
* MAX QUEUE   veh       0      0      1      1           * COST    $    32 *
*                                                        *                    *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/RESEARCH PARK                 11  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  000  360  145  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   70   70  140  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  300  190  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   20   10  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     505    280    515     40      * AVEDEL  s   9.7 *
* CAPACITY    veh     904    739    828    675      * LOS   SIG     A *
* AVE DELAY  mins    0.15   0.13   0.20   0.09      * LOS UNSIG     A *
* MAX DELAY  mins    0.21   0.18   0.29   0.12      *                  *
* AVE QUEUE   veh       1      1      2      0      * VEHIC HRS   3.6 *
* MAX QUEUE   veh       2      1      2      0      * COST    $    54 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/RESEARCH PARK                 12  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  000  345   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*  165   35  235  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  465   50  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  175   35   20  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     395    435    525    230      * AVEDEL  s   9.4 *
* CAPACITY    veh     968    795    848    608      * LOS   SIG     A *
* AVE DELAY  mins    0.10   0.17   0.19   0.16      * LOS UNSIG     A *
* MAX DELAY  mins    0.14   0.25   0.28   0.23      *                  *
* AVE QUEUE   veh       1      1      2      1      * VEHIC HRS   4.2 *
* MAX QUEUE   veh       1      2      2      1      * COST    $    62 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/RESEARCH PARK                 13  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  000  360  145  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   70   70  140  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   25  300  190  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   10   20   10  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     505    280    515     40      * AVEDEL  s   6.2 *
* CAPACITY    veh    1101    936   1025    872      * LOS   SIG     A *
* AVE DELAY  mins    0.10   0.09   0.12   0.07      * LOS UNSIG     A *
* MAX DELAY  mins    0.14   0.12   0.17   0.09      *                  *
* AVE QUEUE   veh       1      0      1      0      * VEHIC HRS   2.3 *
* MAX QUEUE   veh       1      1      1      0      * COST    $    35 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - LACY/RESEARCH PARK                 14  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    4.27   4.27   4.27   4.27     * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00     * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  000  345   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*  165   35  235  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   10  465   50  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*  175   35   20  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     395    435    525    230      * AVEDEL  s   6.1 *
* CAPACITY    veh    1165    992   1045    805      * LOS   SIG     A *
* AVE DELAY  mins    0.08   0.11   0.11   0.10      * LOS UNSIG     A *
* MAX DELAY  mins    0.10   0.15   0.16   0.14      *                  *
* AVE QUEUE   veh       1      1      1      0      * VEHIC HRS   2.7 *
* MAX QUEUE   veh       1      1      1      0      * COST    $    40 *
*                                                    *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - NOBEL/RESEARCH PARK                11  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *        *
* EB NOBEL *1.05*  260  565   60  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   35    5   70  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NOBEL *1.05*    1  225   25  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   15   30   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*************************************************************************
*                                                        *                  *
* FLOW        veh     885    110    251     60          * AVEDEL  s  30.2 *
* CAPACITY    veh     987    670    951    848          * LOS   SIG     C *
* AVE DELAY  mins    0.70   0.10   0.08   0.07          * LOS UNSIG     D *
* MAX DELAY  mins    1.39   0.14   0.11   0.10          *                  *
* AVE QUEUE   veh      11      0      0      0          * VEHIC HRS  10.9 *
* MAX QUEUE   veh      20      0      0      0          * COST    $   164 *
*                                                        *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - NOBEL/RESEARCH PARK                12  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *        *
* EB NOBEL *1.05*   70  235   30  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   10   15  225  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NOBEL *1.05*   15  595    5  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   70    5   15  0           *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*************************************************************************
*                                                        *                  *
* FLOW        veh     335    250    615     90          * AVEDEL  s   9.8 *
* CAPACITY    veh    1013    870    876    566          * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.09   0.24   0.12          * LOS UNSIG     A *
* MAX DELAY  mins    0.11   0.13   0.38   0.17          *                  *
* AVE QUEUE   veh       0      0      3      0          * VEHIC HRS   3.5 *
* MAX QUEUE   veh       1      0      4      0          * COST    $    53 *
*                                                        *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - NOBEL/RESEARCH PARK                13  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *        *
* EB NOBEL *1.05*  260  565   60  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   35    5   70  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NOBEL *1.05*    1  225   25  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   15   30   15  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*************************************************************************
*                                                        *                  *
* FLOW        veh     885    110    251     60          * AVEDEL  s   9.9 *
* CAPACITY    veh    1185    866   1148   1045          * LOS   SIG     A *
* AVE DELAY  mins    0.21   0.08   0.07   0.06          * LOS UNSIG     A *
* MAX DELAY  mins    0.33   0.10   0.08   0.08          *                  *
* AVE QUEUE   veh       3      0      0      0          * VEHIC HRS   3.6 *
* MAX QUEUE   veh       4      0      0      0          * COST    $    54 *
*                                                        *                  *
*************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09              2035 BUILD - NOBEL/RESEARCH PARK                14  *
*                                                                       *
*************************************************************************
*                                                *                      *
* E    (m)    4.27   4.27   4.27   4.27          * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00  40.00          * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00  20.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00  40.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                      *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *        *
* EB NOBEL *1.05*   70  235   30  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB RSPARK*1.05*   10   15  225  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NOBEL *1.05*   15  595    5  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB RSPARK*1.05*   70    5   15  0           *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*          *    *                            *    *  *              *        *
*************************************************************************
*                                                        *                  *
* FLOW        veh     335    250    615     90          * AVEDEL  s   6.0 *
* CAPACITY    veh    1210   1067   1073    763          * LOS   SIG     A *
* AVE DELAY  mins    0.07   0.07   0.13   0.09          * LOS UNSIG     A *
* MAX DELAY  mins    0.09   0.09   0.19   0.12          *                  *
* AVE QUEUE   veh       0      0      1      0          * VEHIC HRS   2.2 *
* MAX QUEUE   veh       0      0      2      0          * COST    $    32 *
*                                                        *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BUILD - LACY/NOBEL                        47  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   4.27   7.13          * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00 100.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*  120  335  100  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*   50  380   25  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   75  380  130  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  190  575  185  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     555    455    585    950          * AVEDEL  s  12.1 *
* CAPACITY    veh    1438    703    759   1414          * LOS   SIG     B *
* AVE DELAY  mins    0.07   0.26   0.39   0.14          * LOS UNSIG     B *
* MAX DELAY  mins    0.10   0.41   0.69   0.21          *                  *
* AVE QUEUE   veh       1      2      4      2          * VEHIC HRS   8.6 *
* MAX QUEUE   veh       1      3      6      3          * COST    $   129 *
*                                                        *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                 2035 BUILD - LACY/NOBEL                        48  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    7.92   4.27   4.27   7.13          * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00 100.00          * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65          * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00  25.00          * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00          * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00          * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0          * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *               *         *
* EB LACY  *1.05*   45  270  300  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*  125  370  115  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  175  230   60  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  120  340   80  0          *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*          *    *                            *    *  *               *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     615    610    465    540          * AVEDEL  s  25.6 *
* CAPACITY    veh    1744    687    612   1503          * LOS   SIG     C *
* AVE DELAY  mins    0.05   1.10   0.46   0.06          * LOS UNSIG     D *
* MAX DELAY  mins    0.07   2.27   0.83   0.08          *                  *
* AVE QUEUE   veh       1     11      4      1          * VEHIC HRS  15.9 *
* MAX QUEUE   veh       1     24      6      1          * COST    $   238 *
*                                                        *                  *
*******************************************************************************
```

```
*************************************************************************
*                                                                       *
*   9:1:09                 2035 BUILD - LACY/NOBEL                  49  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.92   4.27   4.27   7.13     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00 100.00     * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00  25.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    AM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*  120  335  100  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*   50  380   25  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*   75  380  130  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  190  575  185  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     555    455    585    950      * AVEDEL  s   6.5 *
* CAPACITY    veh    1635    900    956   1611      * LOS   SIG     A *
* AVE DELAY  mins    0.06   0.14   0.17   0.09      * LOS UNSIG     A *
* MAX DELAY  mins    0.08   0.20   0.25   0.14      *                  *
* AVE QUEUE   veh       1      1      2      2      * VEHIC HRS   4.6 *
* MAX QUEUE   veh       1      1      2      2      * COST    $    69 *
*                                                    *                  *
*************************************************************************



*************************************************************************
*                                                                       *
*   9:1:09                 2035 BUILD - LACY/NOBEL                  50  *
*                                                                       *
*************************************************************************
*                                          *                            *
* E    (m)    7.92   4.27   4.27   7.13     * TIME PERIOD     min    90  *
* L'   (m)   40.00 100.00  40.00 100.00     * TIME SLICE      min    15  *
* V    (m)    7.31   3.65   3.65   3.65     * RESULTS PERIOD  min 15 75  *
* RAD  (m)   25.00  20.00  20.00  25.00     * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00  30.00     * FLOW PERIOD     min 15 75  *
* DIA  (m)   50.00  50.00  50.00  50.00     * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0      0     * FLOW PEAK  am/op/pm    PM  *
*                                          *                            *
*************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                          *    *  *               *         *
* EB LACY  *1.05*   45  270  300  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB NOBEL *1.05*  125  370  115  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB LACY  *1.05*  175  230   60  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
* SB NEWLCY*1.05*  120  340   80  0          *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*          *    *                          *    *  *               *         *
*************************************************************************
*                                                    *                  *
* FLOW        veh     615    610    465    540      * AVEDEL  s   7.7 *
* CAPACITY    veh    1941    884    808   1700      * LOS   SIG     A *
* AVE DELAY  mins    0.04   0.24   0.18   0.05      * LOS UNSIG     A *
* MAX DELAY  mins    0.06   0.39   0.28   0.07      *                  *
* AVE QUEUE   veh       0      3      1      0      * VEHIC HRS   4.7 *
* MAX QUEUE   veh       1      4      2      1      * COST    $    71 *
*                                                    *                  *
*************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/FAHEY                       30  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   20  775    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    5    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  345   30    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     795     10    375                    * AVEDEL  s  13.8 *
* CAPACITY    veh    1010    594   1024                    * LOS   SIG     B *
* AVE DELAY  mins    0.30   0.10   0.09                    * LOS UNSIG     B *
* MAX DELAY  mins    0.49   0.14   0.12                    *                  *
* AVE QUEUE   veh       4      0      1                    * VEHIC HRS   4.5 *
* MAX QUEUE   veh       6      0      1                    * COST    $    68 *
*                                                          *                  *
*******************************************************************************
```

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*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/FAHEY                       31  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   10  535    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   25   30    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  900    5    0              *1.00*85*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                          *                  *
* FLOW        veh     545     55    905                    * AVEDEL  s  27.4 *
* CAPACITY    veh    1024    728   1010                    * LOS   SIG     C *
* AVE DELAY  mins    0.12   0.09   0.68                    * LOS UNSIG     D *
* MAX DELAY  mins    0.17   0.11   1.34                    *                  *
* AVE QUEUE   veh       1      0     11                    * VEHIC HRS  11.4 *
* MAX QUEUE   veh       1      0     19                    * COST    $   172 *
*                                                          *                  *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/FAHEY                       32  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    AM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   20  775    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*    5    5    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  345   30    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     795     10    375                  * AVEDEL  s   7.3 *
* CAPACITY    veh    1207    791   1221                  * LOS   SIG     A *
* AVE DELAY  mins    0.15   0.08   0.07                  * LOS UNSIG     A *
* MAX DELAY  mins    0.22   0.10   0.09                  *                   *
* AVE QUEUE   veh       2      0      0                  * VEHIC HRS   2.4 *
* MAX QUEUE   veh       3      0      1                  * COST    $    36 *
*                                                        *                    *
*******************************************************************************
```

```
*******************************************************************************
*                                                                             *
*   9:1:09                2035 BUILD - CHERYL/FAHEY                       33  *
*                                                                             *
*******************************************************************************
*                                                *                            *
* E    (m)    4.27   4.27   4.27                 * TIME PERIOD     min    90  *
* L'   (m)   40.00  40.00  40.00                 * TIME SLICE      min    15  *
* V    (m)    3.65   3.65   3.65                 * RESULTS PERIOD  min 15 75  *
* RAD  (m)   20.00  20.00  20.00                 * TIME COST      $/hr 15.00  *
* PHI  (d)   30.00  30.00  30.00                 * FLOW PERIOD     min 15 75  *
* DIA  (m)   40.00  40.00  40.00                 * FLOW TYPE   pcu/veh   VEH  *
* GRAD SEP       0      0      0                 * FLOW PEAK  am/op/pm    PM  *
*                                                *                            *
*******************************************************************************
* LEG NAME *PCU *VEH TURNS (1st exit, 2nd..U)*FLOF*CL*  FLOW RATIO   *FLOW TIME*
*          *    *                            *    *  *              *         *
* EB CHERYL*1.05*   10  535    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
* NB FAHEY *1.05*   25   30    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
* WB NEWLCY*1.05*  900    5    0              *1.00*50*0.75 1.125 0.75*15 45 75 *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*          *    *                            *    *  *              *         *
*******************************************************************************
*                                                        *                    *
* FLOW        veh     545     55    905                  * AVEDEL  s   9.6 *
* CAPACITY    veh    1221    925   1207                  * LOS   SIG     A *
* AVE DELAY  mins    0.09   0.07   0.21                  * LOS UNSIG     A *
* MAX DELAY  mins    0.12   0.09   0.33                  *                   *
* AVE QUEUE   veh       1      0      3                  * VEHIC HRS   4.0 *
* MAX QUEUE   veh       1      0      5                  * COST    $    60 *
*                                                        *                    *
*******************************************************************************
```