

TRAFFIC IMPACT ANALYSIS FOR:

THE MCGAW PARK NEIGHBORHOOD PLAN
CITY OF FITCHBURG, DANE COUNTY, WISCONSIN

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PREPARED FOR:

City of Fitchburg DPW
5520 Lacy Road
Fitchburg, WI 53711
Phone: (608) 270-4200
Facsimile: (608) 270-42112
Contact Person: Paul Woodard, P.E.

PREPARED BY:

Traffic Analysis & Design, Inc.
N36 W7505 Buchanan Street
Cedarburg, WI 53012
Phone: (800) 605-3091
Facsimile: (262) 377-4381
Contact Person: Michael May, P.E., PTOE

“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
Table of Contents

LIST OF EXHIBITS.....	ii
LIST OF APPENDICES.....	iv
CHAPTER I – INTRODUCTION & EXECUTIVE SUMMARY.....	1
PART A – PURPOSE OF REPORT AND STUDY OBJECTIVES.....	1
PART B – BASE INFORMATION	1
PART C – RECOMMENDED IMPROVEMENTS.....	6
PART D – CONCLUSION.....	15
CHAPTER II – PROPOSED DEVELOPMENT.....	16
PART A – ON-SITE DEVELOPMENT	16
PART B – STUDY AREA	18
PART C – OFF-SITE LAND USE AND DEVELOPMENT.....	20
PART D – SITE ACCESSIBILITY	20
CHAPTER III – ANALYSIS OF EXISTING CONDITIONS.....	23
PART A – PHYSICAL CHARACTERISTICS	23
PART B – TRAFFIC VOLUMES.....	23
PART C – CAPACITY LEVEL OF SERVICE	23
PART D – SOURCES OF DATA	24
CHAPTER IV – FORECASTED TRAFFIC.....	26
PART A – BACKGROUND TRAFFIC FORECASTING	26
PART B – DEVELOPMENT TRAFFIC FORECASTING.....	27
PART C – BUILD TRAFFIC.....	28
CHAPTER V – TRAFFIC AND IMPROVEMENT ANALYSIS	30
PART A – SITE ACCESS.....	30
PART B – CAPACITY ANALYSIS – NO IMPROVEMENTS	30
PART C – CAPACITY ANALYSIS – WITH IMPROVEMENTS.....	30
PART D – QUEUEING ANALYSIS	31
PART E – PEDESTRIAN, BICYCLE AND MULTI-USE TRAIL CONSIDERATIONS.....	32
PART F – SPEED CONSIDERATIONS/SIGHT DISTANCE.....	32
CHAPTER VI – RECOMMENDATIONS AND CONCLUSION	33
PART A – RECOMMENDATIONS.....	33
PART B – CONCLUSION.....	42

LIST OF EXHIBITS

- Exhibit 1-1 MPN Growth Model
- Exhibit 1-2 MPN Study Area Roadways & Intersections
- Exhibit 1-3 Proposed Roadway Cross-Sections
- Exhibit 1-4 Potential Multi-Use Trails
- Exhibit 1-5 Potential Transit Improvements
- Exhibit 1-6 Year 2008 Existing Traffic Recommended Improvements
- Exhibit 1-7 Year 2025 Background Traffic Recommended Improvements
- Exhibit 1-8 Year 2035 Background Traffic Recommended Improvements
- Exhibit 1-9 Year 2025 Build Traffic Recommended Improvements
- Exhibit 1-10 Year 2035 Build Traffic Recommended Improvements
-
- Exhibit 2-1 MPN Study Area Roadways & Intersections
- Exhibit 2-2 MPN Growth Model
- Exhibit 2-3 Fitchburg Year 2007 Existing Land Use Map & DRAFT Future Urban Growth
Area Neighborhoods
- Exhibit 2-4 Proposed Roadway Cross-Sections
- Exhibit 2-5 Potential Multi-Use Trails
- Exhibit 2-6 Potential Transit Improvements
-
- Exhibit 3-1a.....Anticipated Transportation Detail, After Fish Hatchery Road Reconstruction
- Exhibit 3-1b Anticipated Transportation Detail, After All Known Reconstruction Plans
- Exhibit 3-2 Year 2008 Existing Traffic
- Exhibit 3-3 Year 2008 Existing Traffic Peak Hour Operating Conditions
-
- Exhibit 4-1a.....Year 2025 Background Traffic
- Exhibit 4-2 Year 2035 Background Traffic
- Exhibit 4-3a.....MPN Total Traffic Trip Generation Tables
- Exhibit 4-3b MPN Traffic Analysis Zones (TAZ)
- Exhibit 4-3c.....MPN Year 2025 Trip Generation Tables per TAZ – TAZ A through TAZ D
- Exhibit 4-3d MPN Year 2025 Trip Generation Tables per TAZ – TAZ E through TAZ H
- Exhibit 4-3e.....MPN Year 2035 Trip Generation Tables per TAZ – TAZ A through TAZ D
- Exhibit 4-3f MPN Year 2035 Trip Generation Tables per TAZ – TAZ E through TAZ H

Exhibit 4-4 MPN Anticipated Trip Distributions

Exhibit 4-5 MPN Year 2025 Trip Assignment

Exhibit 4-6 MPN Year 2035 Trip Assignment

Exhibit 4-7 Year 2025 Background Traffic – With Trip Diversions

Exhibit 4-8 Year 2035 Background Traffic – With Trip Diversions

Exhibit 4-9 Year 2025 Build Traffic

Exhibit 4-10 Year 2035 Build Traffic

Exhibit 4-11 Average Daily Traffic Forecasts

Exhibit 5-1 Year 2025 Background Traffic Operating Conditions – No Improvements

Exhibit 5-2 Year 2035 Background Traffic Operating Conditions – No Improvements

Exhibit 5-3 Year 2025 Build Traffic Operating Conditions – No Improvements

Exhibit 5-4 Year 2035 Build Traffic Operating Conditions – No Improvements

Exhibit 5-5 Year 2008 Existing Traffic Operating Conditions – With Improvements

Exhibit 5-6 Year 2025 Background Traffic Operating Conditions – With Improvements

Exhibit 5-7 Year 2035 Background Traffic Operating Conditions – With Improvements

Exhibit 5-8 Year 2025 Build Traffic Operating Conditions – With Improvements

Exhibit 5-9 Year 2035 Build Traffic Operating Conditions – With Improvements

Exhibit 5-10 Year 2008 Existing Traffic – Expected Maximum Queues With Improvements

Exhibit 5-11 Year 2025 Background Traffic – Expected Maximum Queues With
Improvements

Exhibit 5-12 Year 2035 Background Traffic – Expected Maximum Queues With
Improvements

Exhibit 5-13 Year 2025 Build Traffic – Expected Maximum Queues With Improvements

Exhibit 5-14 Year 2035 Build Traffic – Expected Maximum Queues With Improvements

LIST OF APPENDICES

Appendix A.....Traffic

- Existing Traffic Counts*
- Existing Traffic Signal Timings*
- MPO Year 2025 Background Traffic ADT Forecasts*
- MPO Year 2035 Background Traffic ADT Forecasts*
- MPO Year 2025 Build Traffic ADT Forecasts*
- MPO Year 2035 Build Traffic ADT Forecasts*
- City of Fitchburg Bicycle & Pedestrian Plan Maps*

Appendix B.....Background Traffic – Peak Hour Analysis Outputs

- Year 2008 Existing Traffic Analysis*
- Year 2025 Background Traffic Analysis*
- Year 2035 Background Traffic Analysis*

Appendix C.....Build Traffic – Peak Hour Analysis Outputs

- Year 2025 Build Traffic Analysis*
- Year 2035 Build Traffic Analysis*

Appendix D.....Background Traffic – Peak Hour Improvement Analysis Outputs

- Year 2008 Existing Traffic Analysis – With Improvements*
- Year 2025 Background Traffic Analysis – With Improvements*
- Year 2035 Background Traffic Analysis – With Improvements*

Appendix E.....Build Traffic – Peak Hour Improvement Analysis Outputs

- Year 2025 Build Traffic Analysis – With Improvements*
- Year 2035 Build Traffic Analysis – With Improvements*

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-foot 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

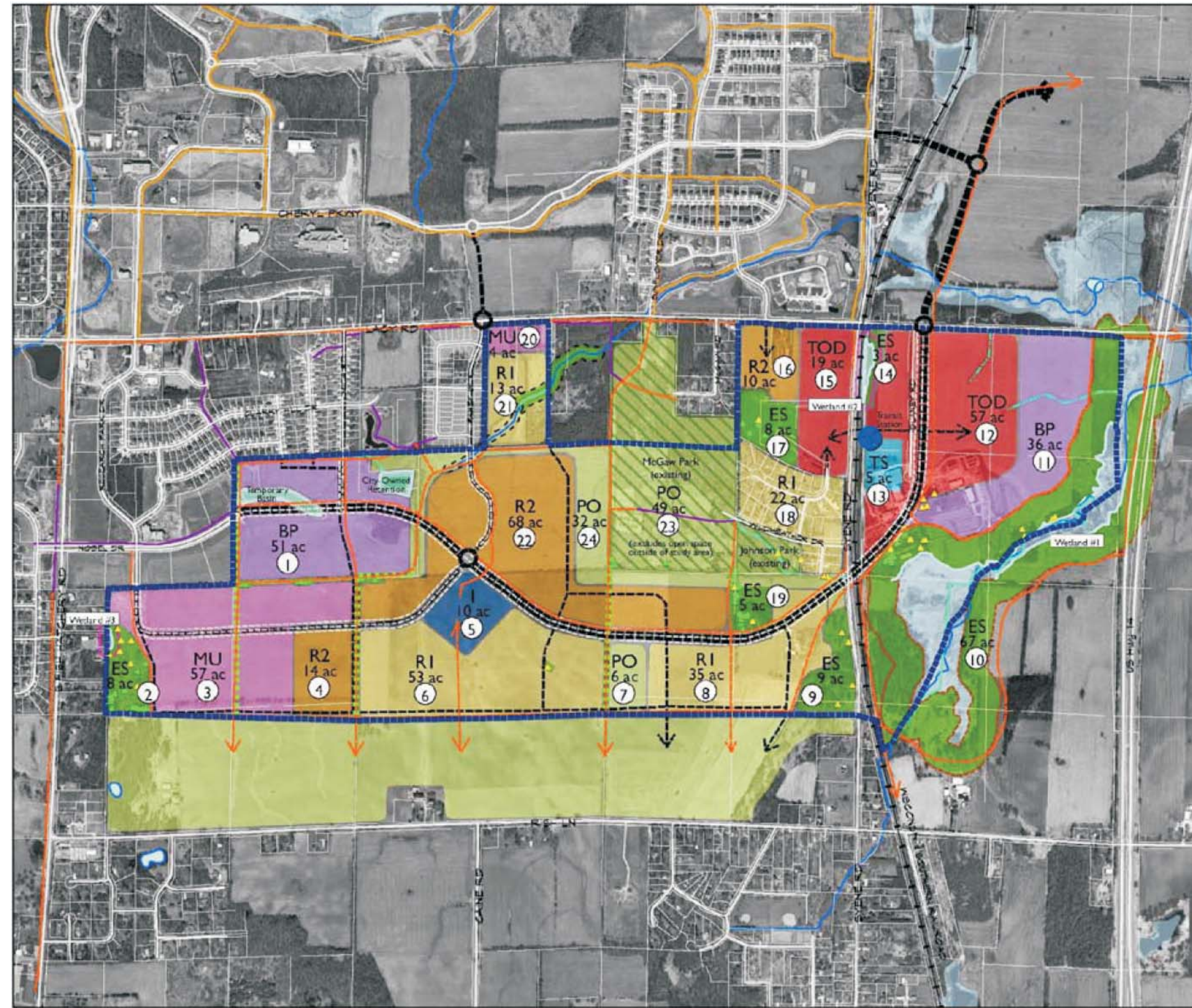
LEGEND

- Study Area Boundary
- 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)
- Transit Oriented Development
- PO Parks & Open Space
- Existing Parks
- ES Environmentally Sensitive Areas
- BP Business Park
- 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

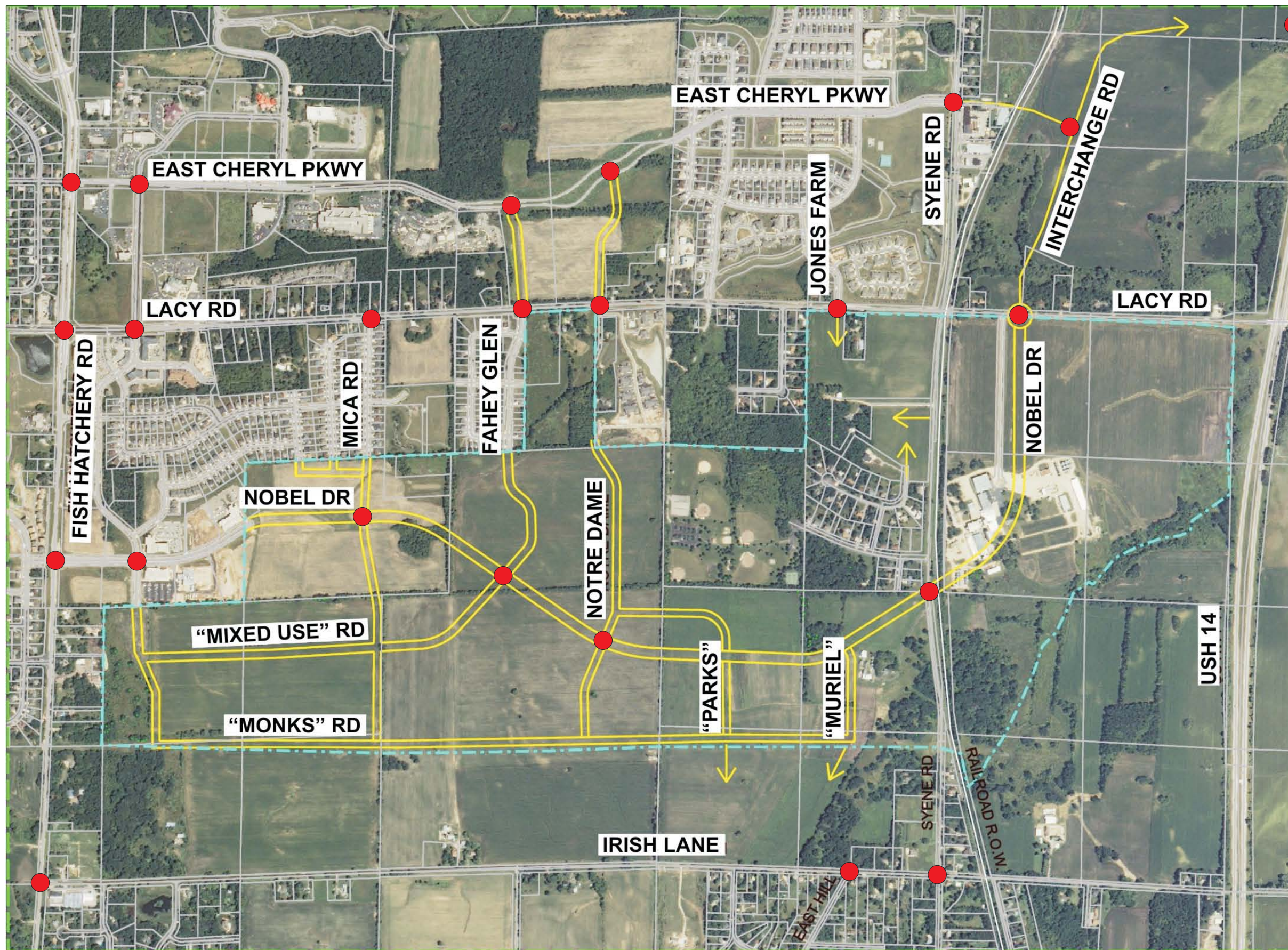
Last Revised: February 3, 2009

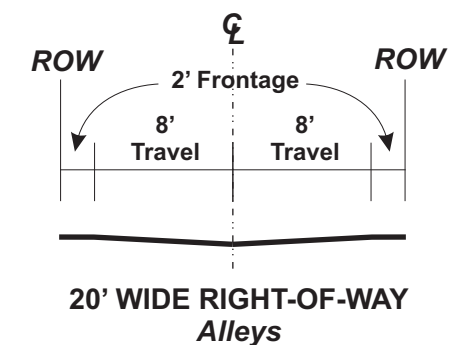
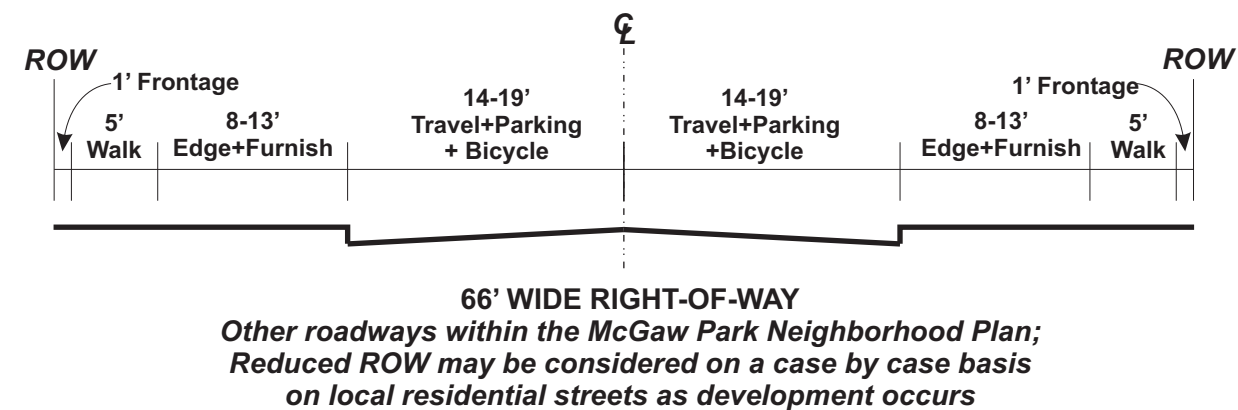
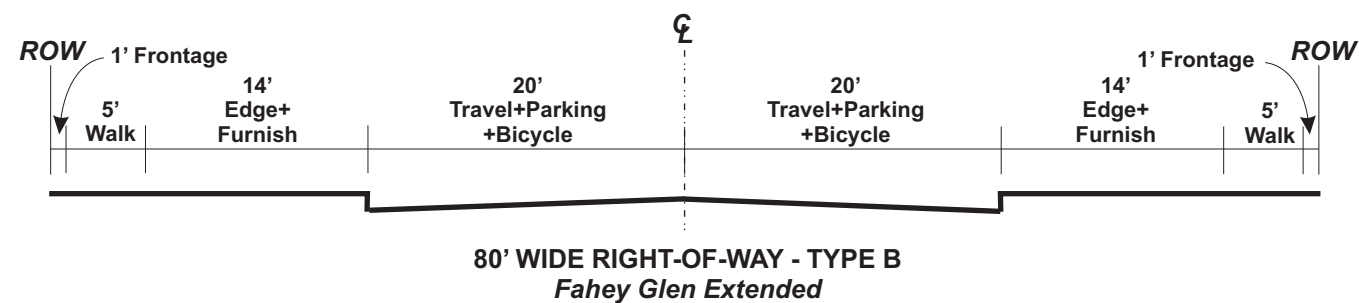
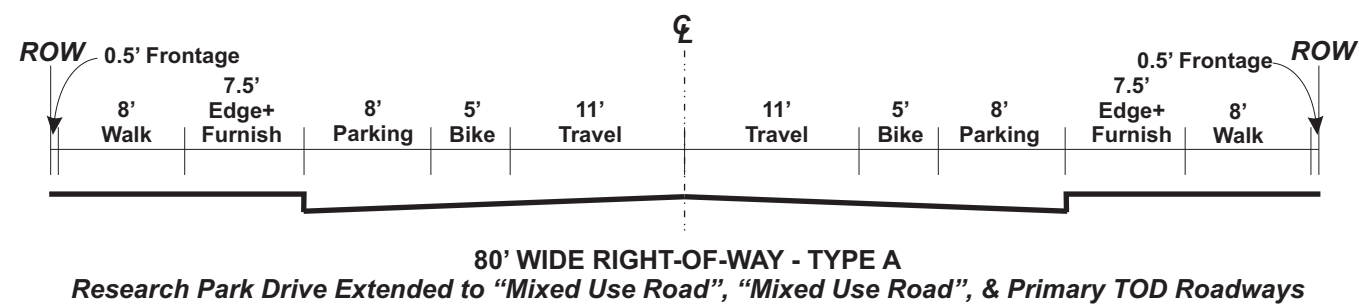
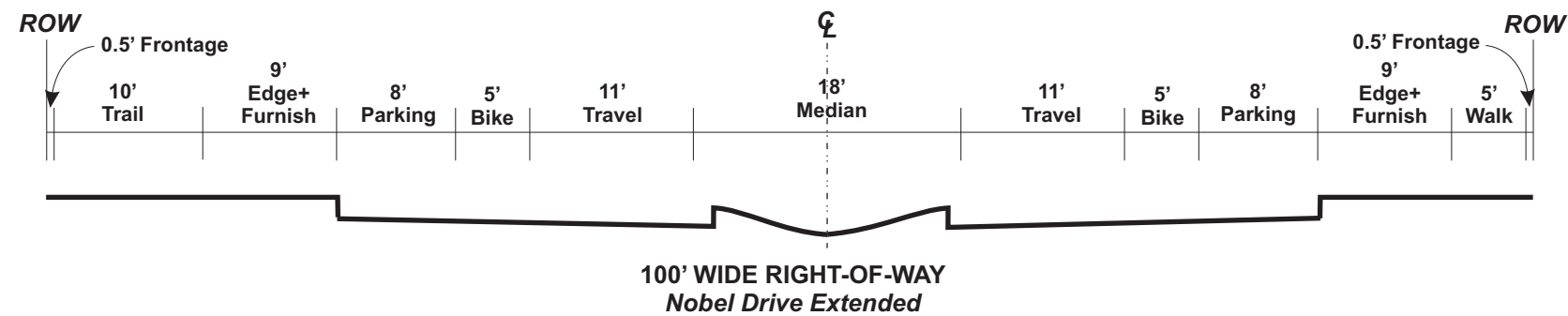
☐ GIS map files provided by City of Fitchburg & Capital Area RPC
☐ Maps prepared by TAI | MARS | NRC | TAD

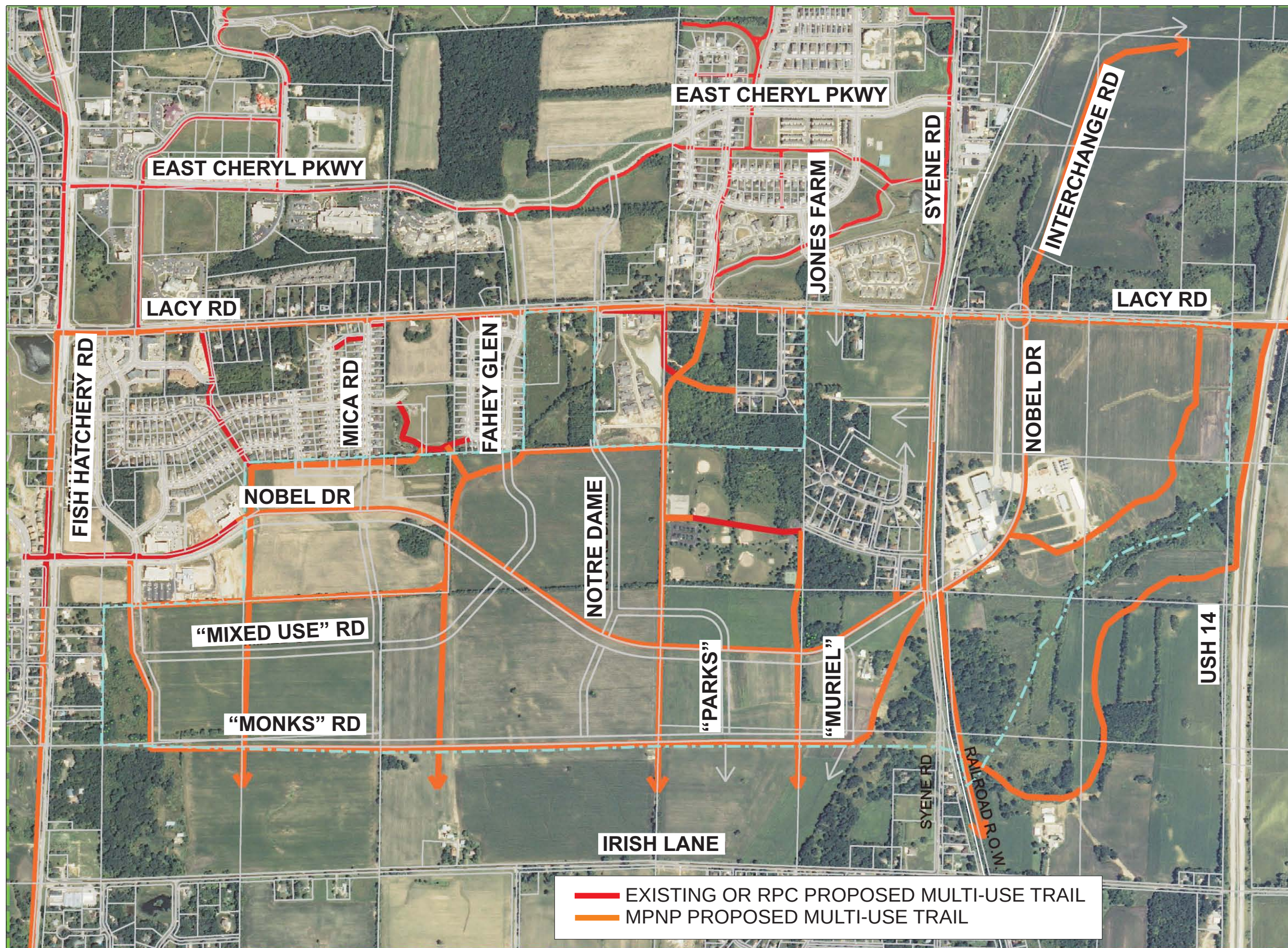
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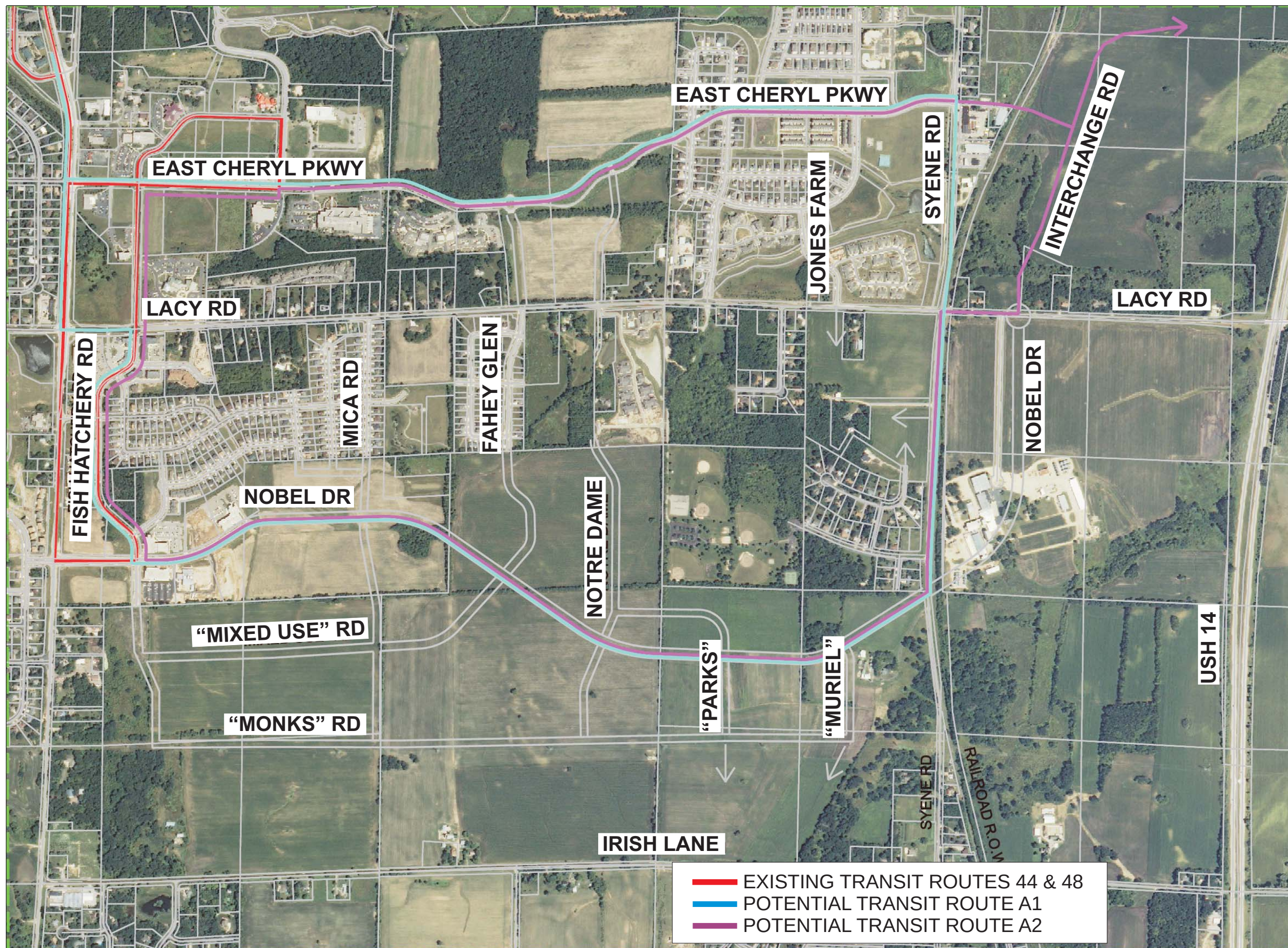


THIS IS THE DRAFT GROWTH MODEL. See Exhibits 1-2 through 1-5 for more accurate locations of roadways, intersections, trails, and potential transit routes.







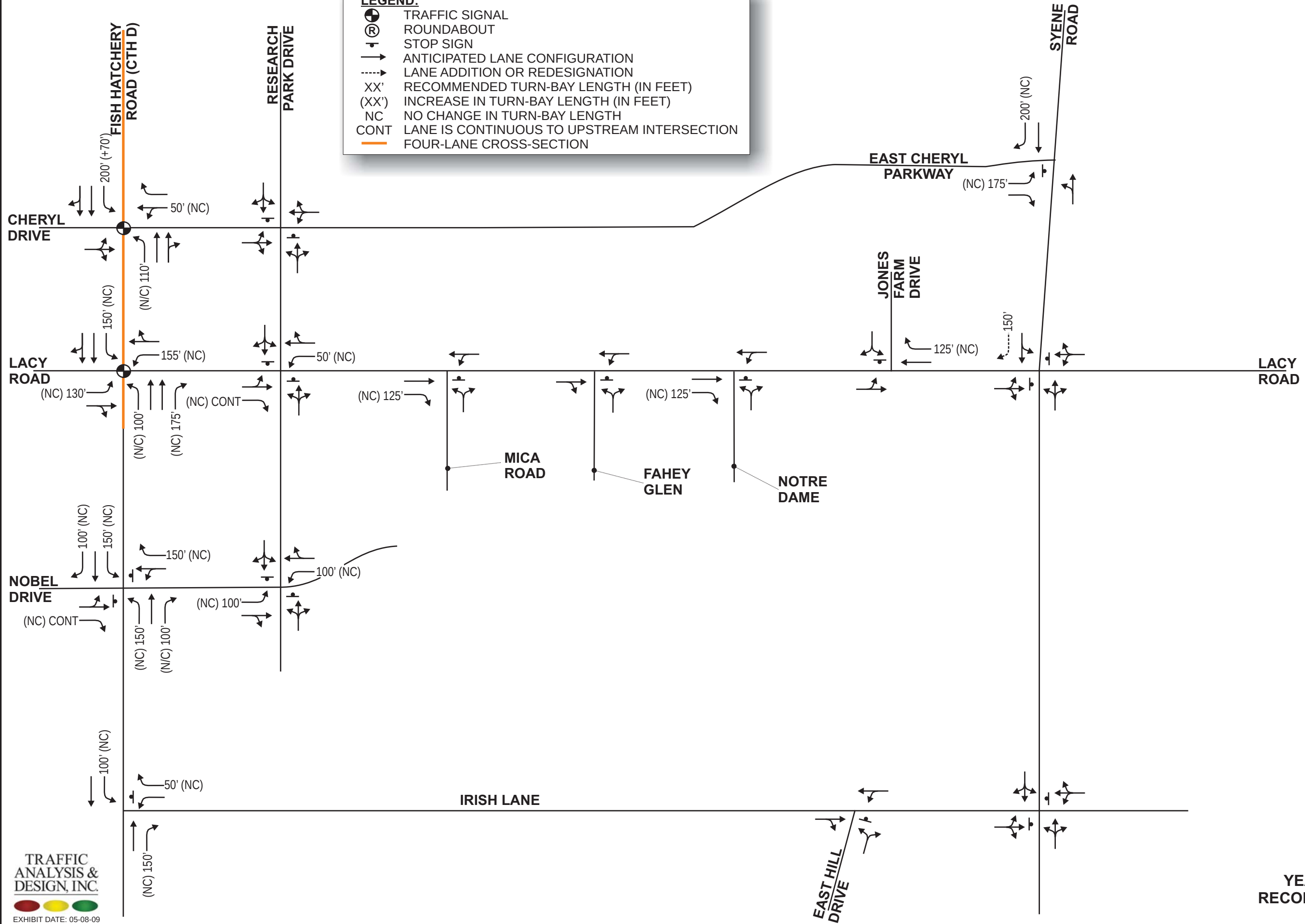


(IN ADDITION TO CITY PLANS TO IMPROVE FISH HATCHERY ROAD)



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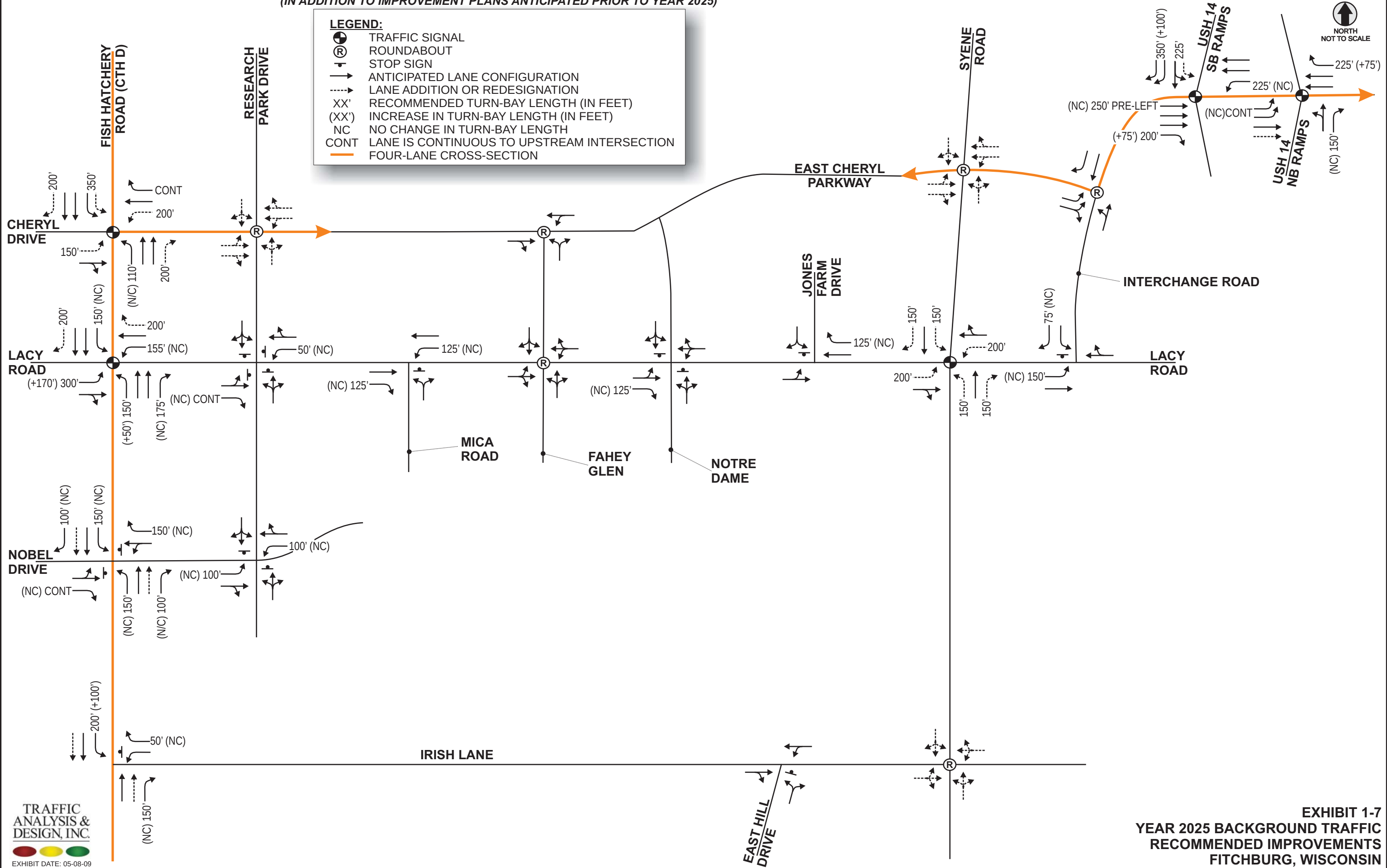
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- Ⓡ ROUNDABOUT
- ⊥ STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
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- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION



(IN ADDITION TO IMPROVEMENT PLANS ANTICIPATED PRIOR TO YEAR 2025)

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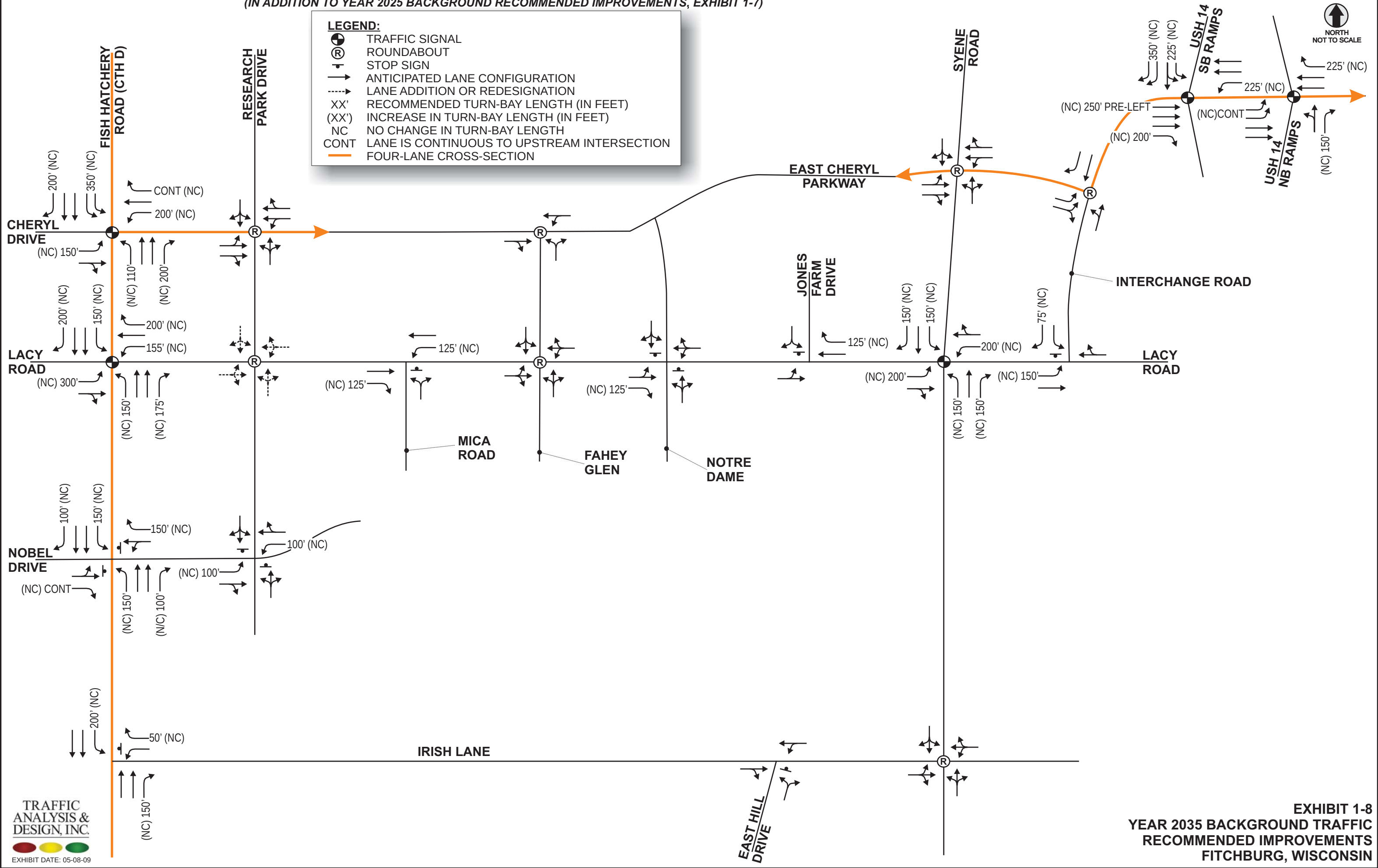
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- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION



(IN ADDITION TO YEAR 2025 BACKGROUND RECOMMENDED IMPROVEMENTS, EXHIBIT 1-7)

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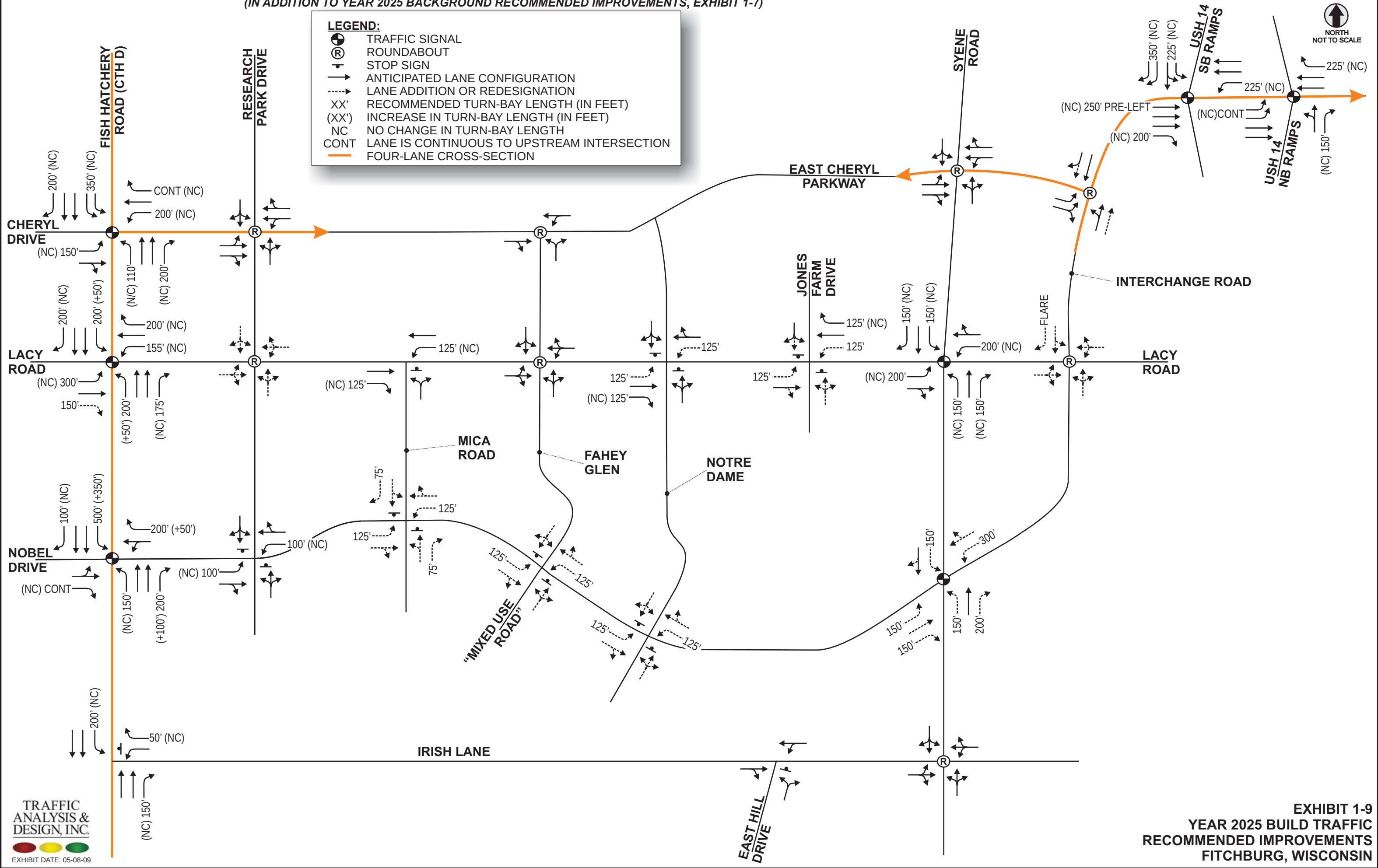
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- LANE ADDITION OR REDESIGNATION
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- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION



(IN ADDITION TO YEAR 2025 BACKGROUND RECOMMENDED IMPROVEMENTS, EXHIBIT 1-7)

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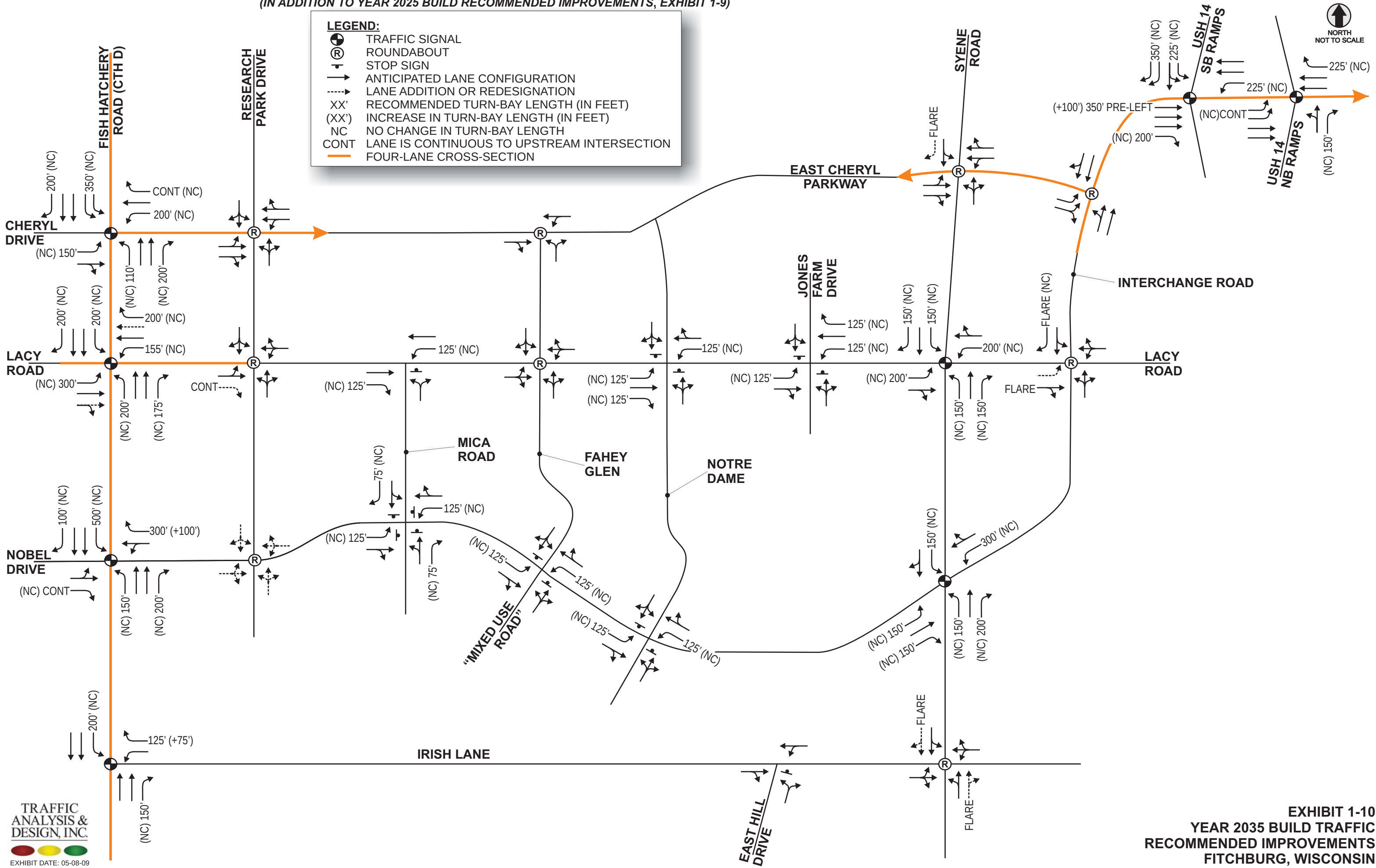
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- ⊥ STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR REDESIGNATION
- XX' RECOMMENDED TURN-BAY LENGTH (IN FEET)
- (XX') INCREASE IN TURN-BAY LENGTH (IN FEET)
- NC NO CHANGE IN TURN-BAY LENGTH
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION



(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



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 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.

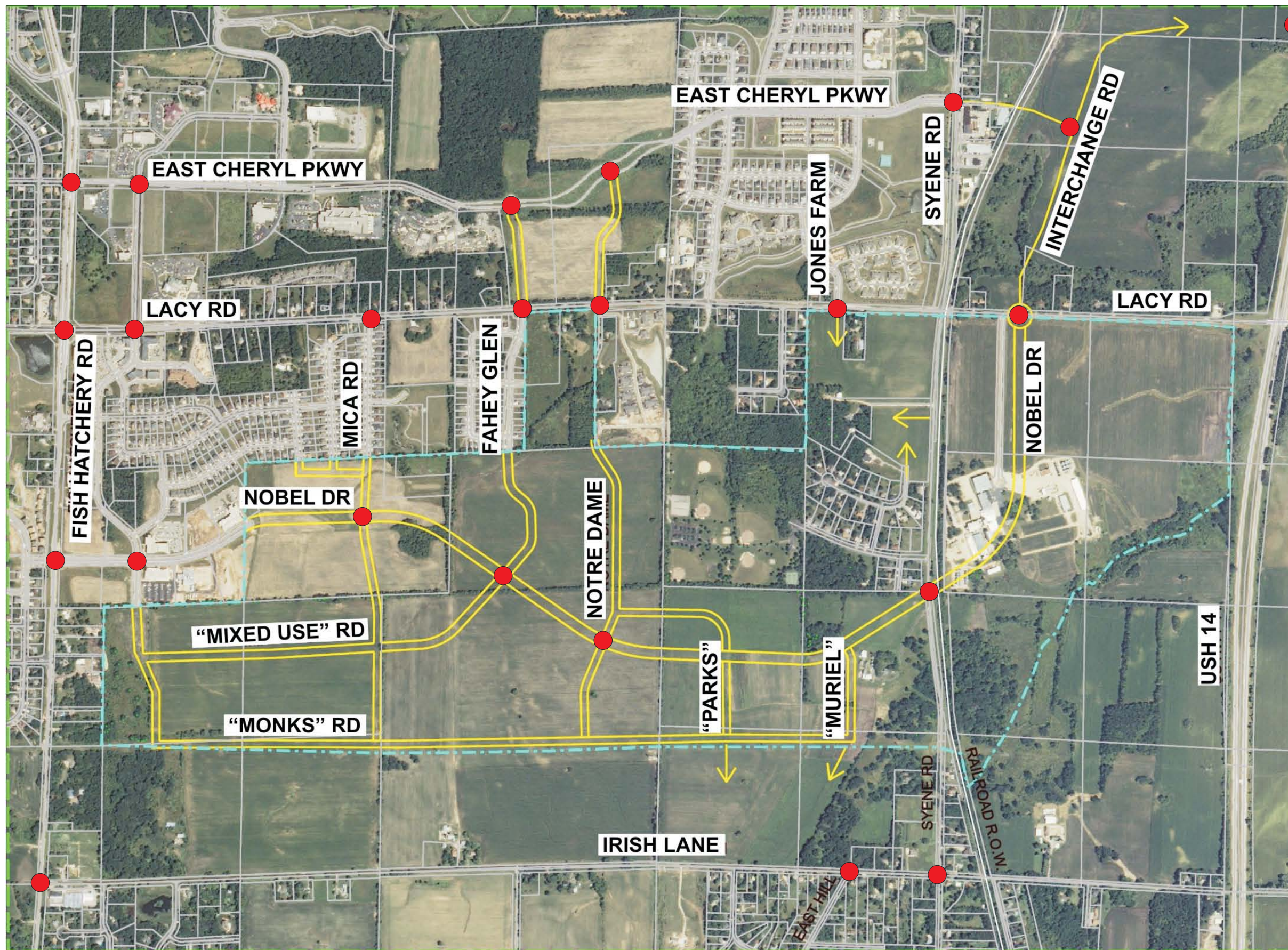
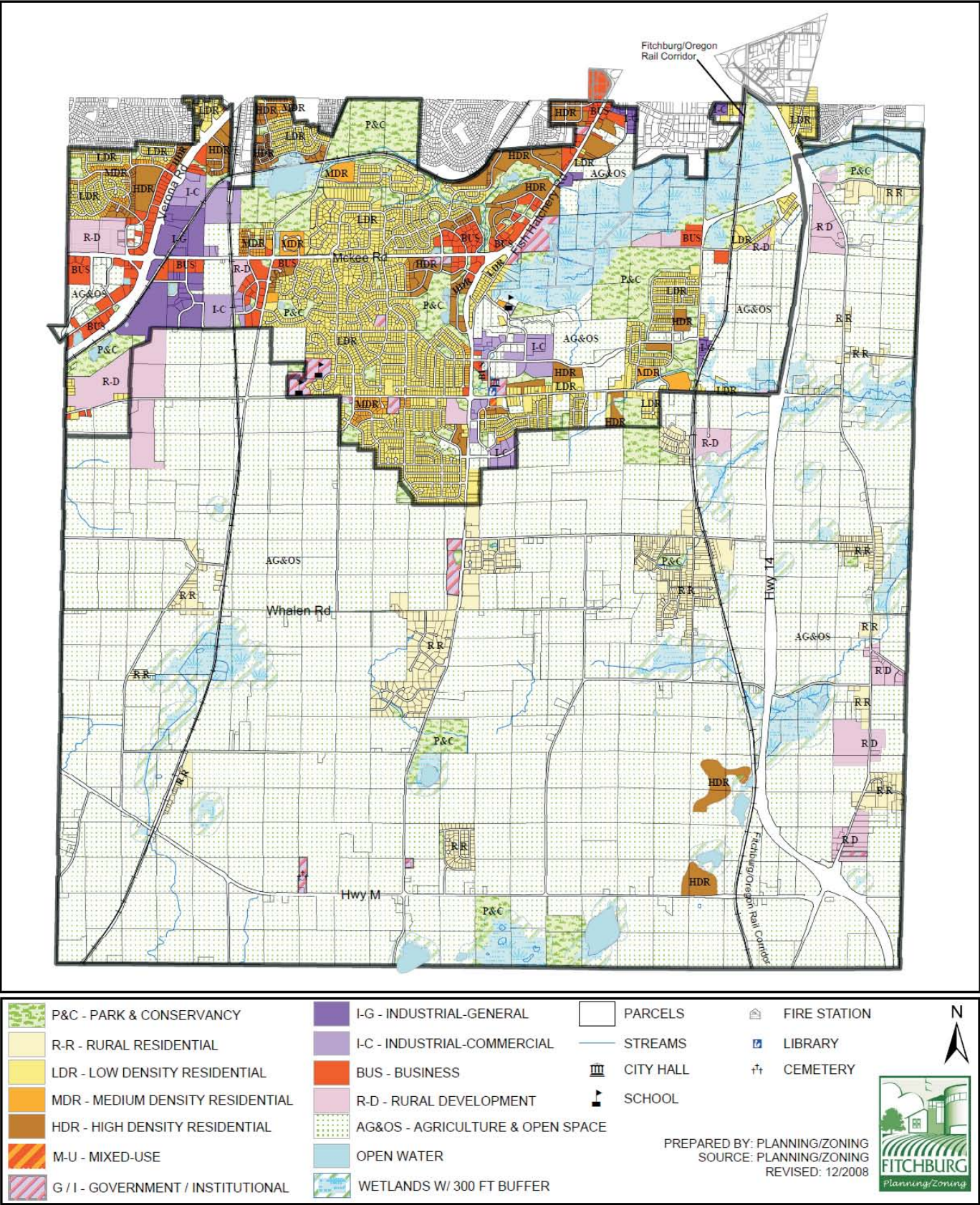


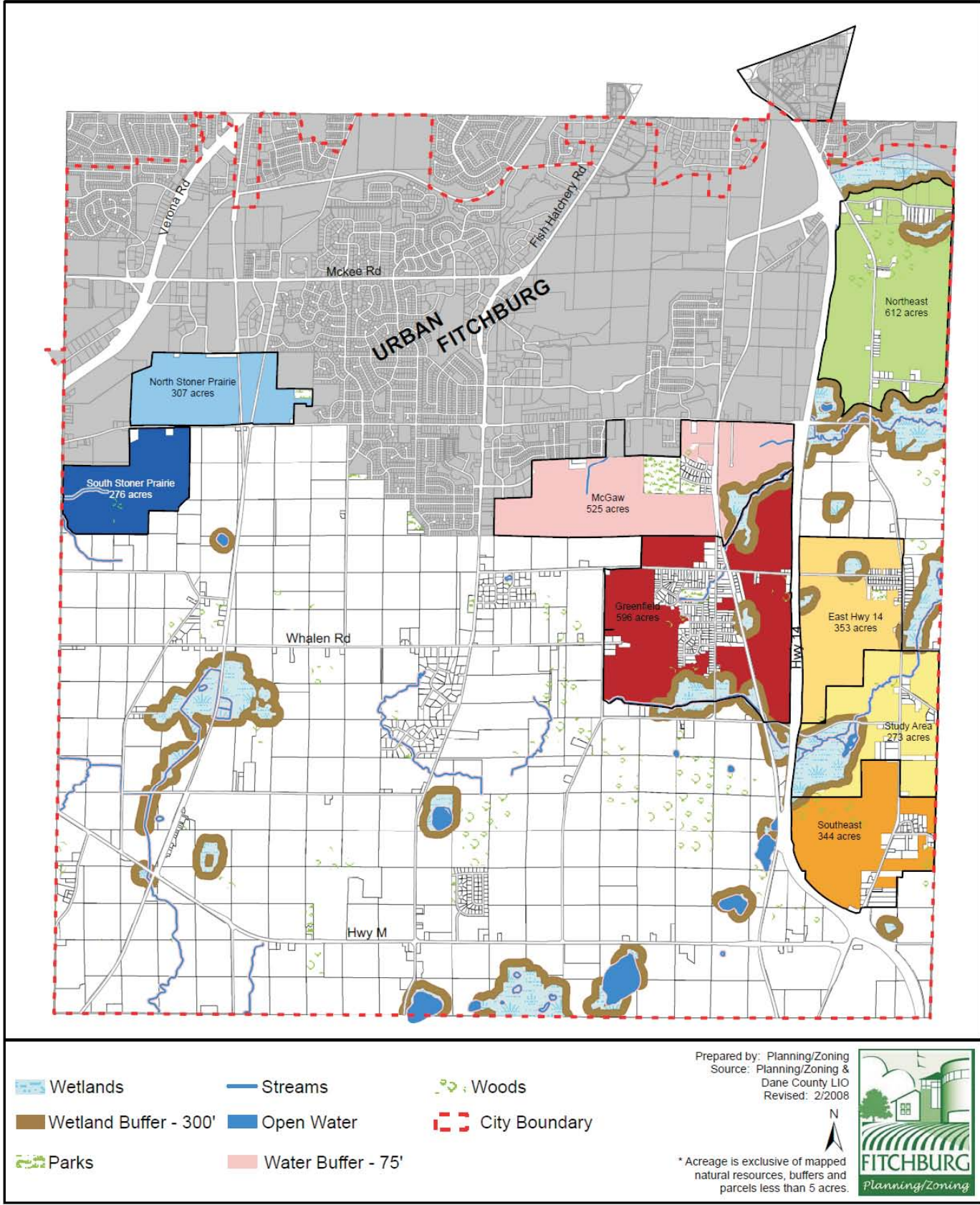


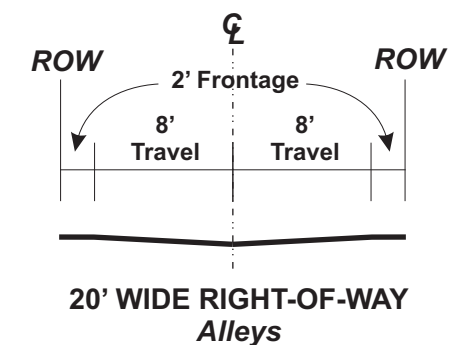
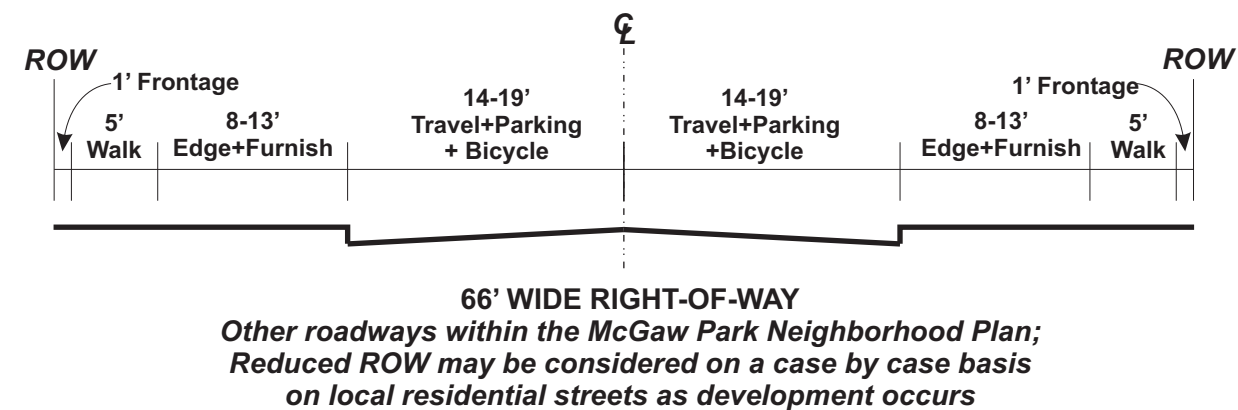
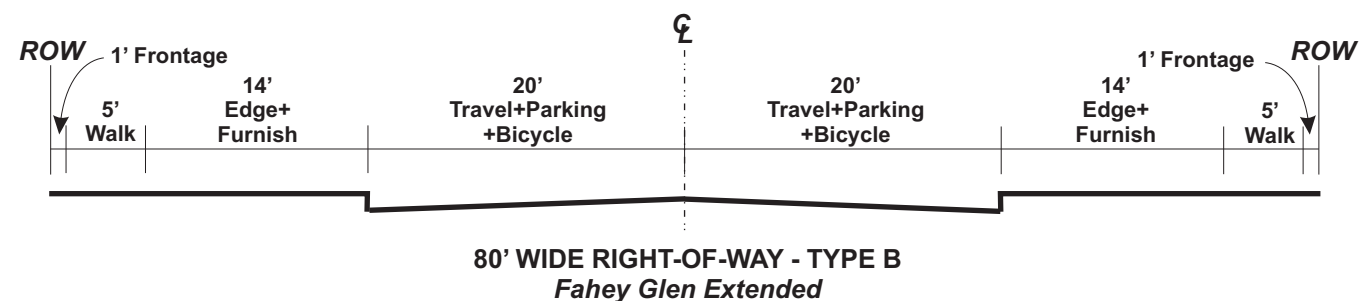
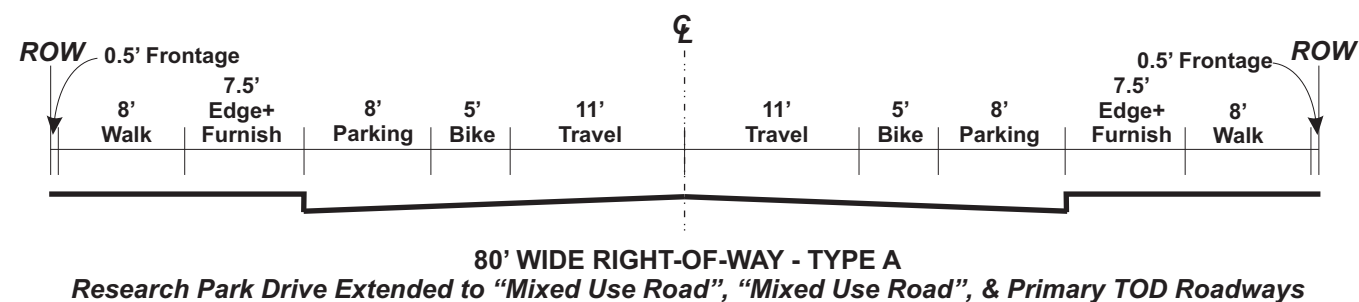
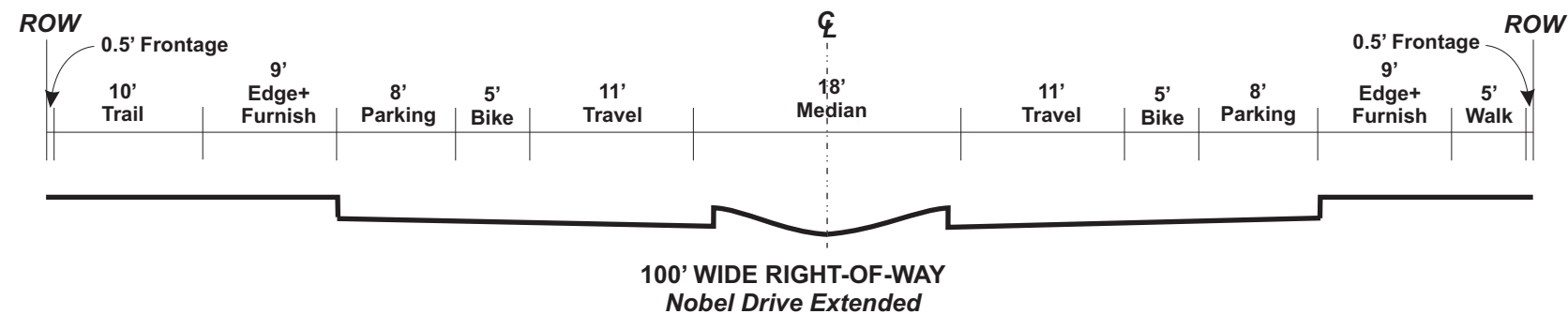
EXHIBIT 2-2
MPN GROWTH MODEL
FITCHBURG, WISCONSIN

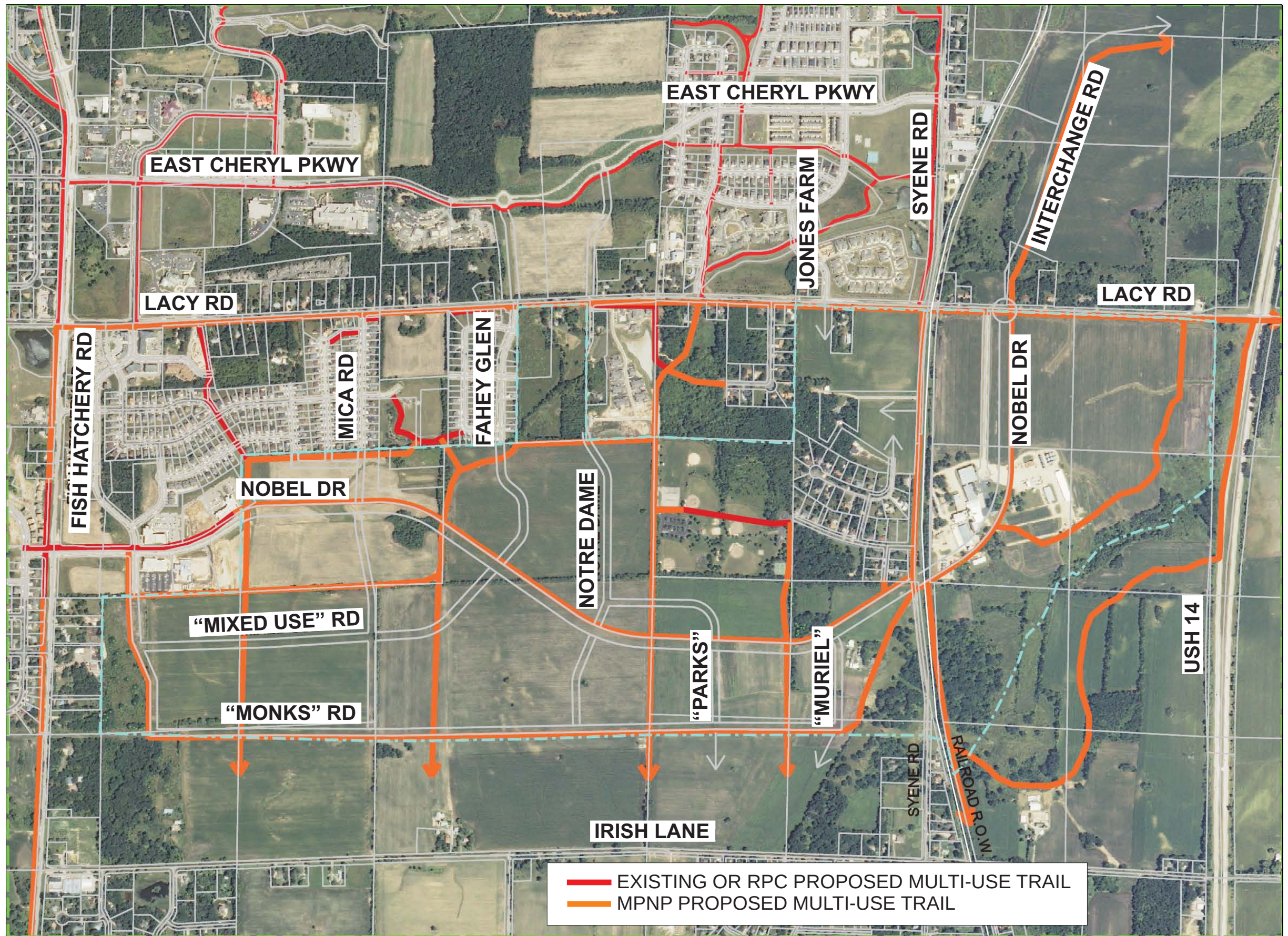
2007 EXISTING LAND USE MAP

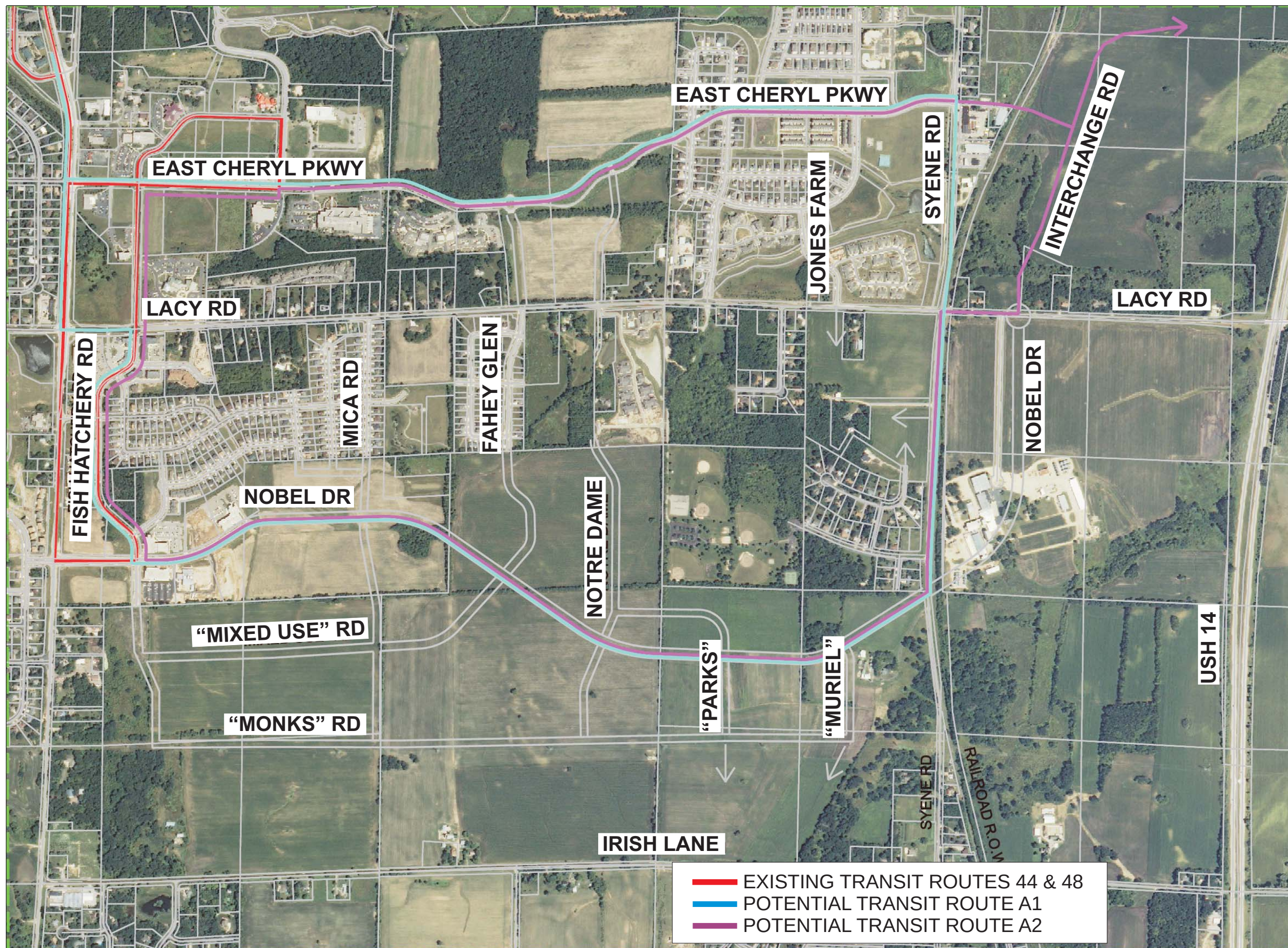


FUTURE URBAN GROWTH AREA NEIGHBORHOODS









- EXISTING TRANSIT ROUTES 44 & 48
- POTENTIAL TRANSIT ROUTE A1
- POTENTIAL TRANSIT ROUTE A2

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

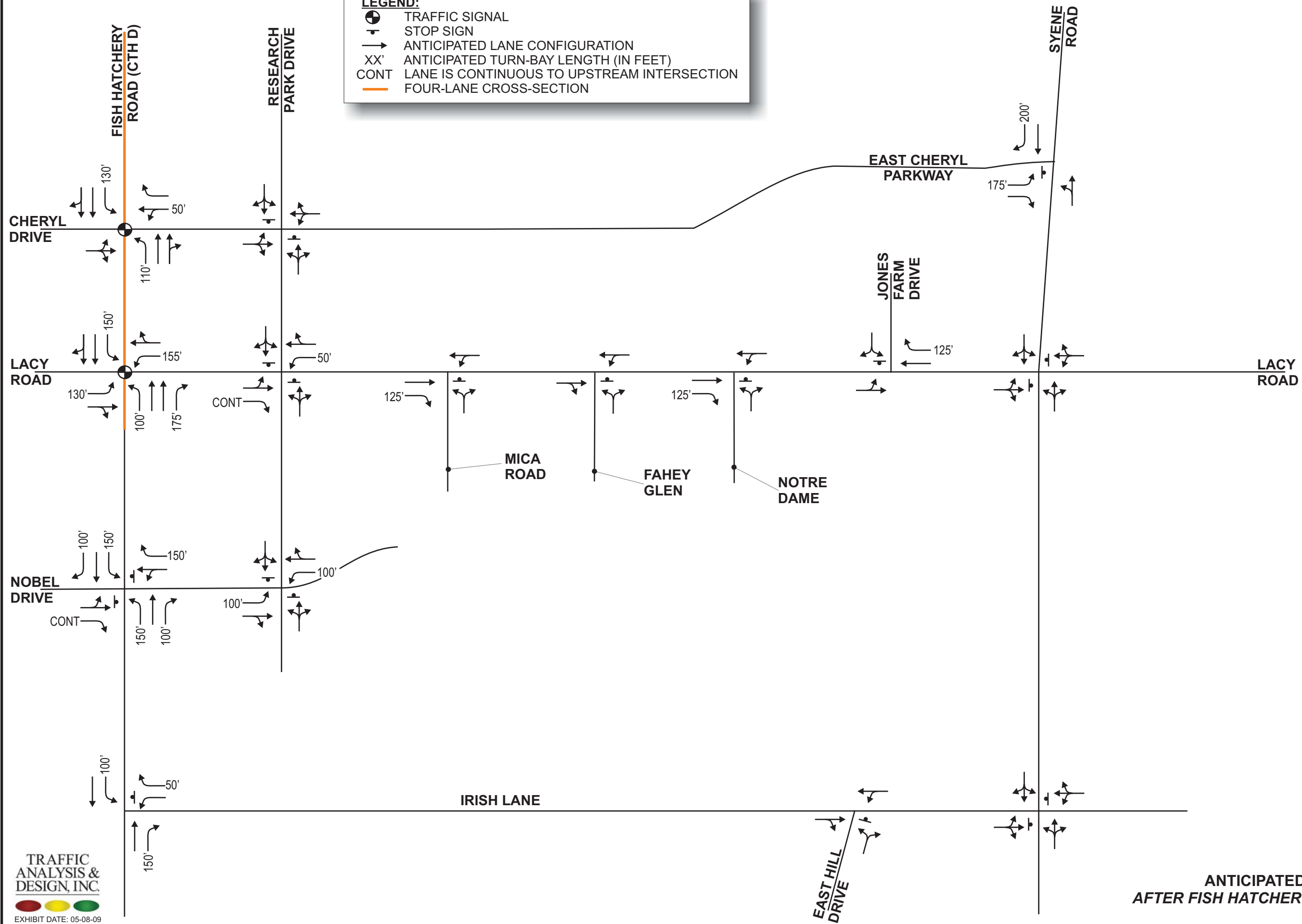
The following sources of data were obtained for use in conducting this traffic study.

- 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/>)

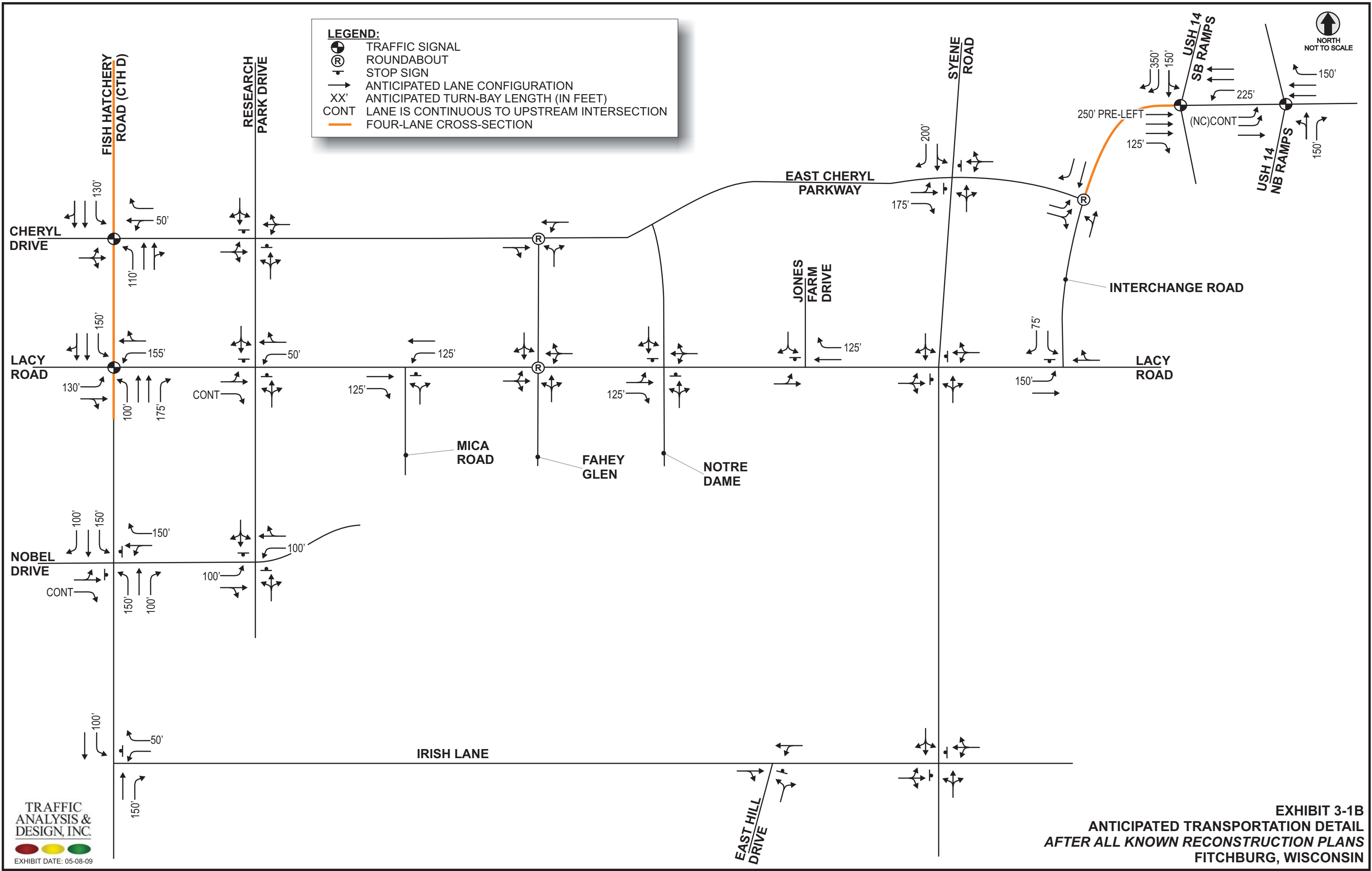


- LEGEND:**
- TRAFFIC SIGNAL
 - ⊥ STOP SIGN
 - ANTICIPATED LANE CONFIGURATION
 - XX' ANTICIPATED TURN-BAY LENGTH (IN FEET)
 - CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
 - FOUR-LANE CROSS-SECTION



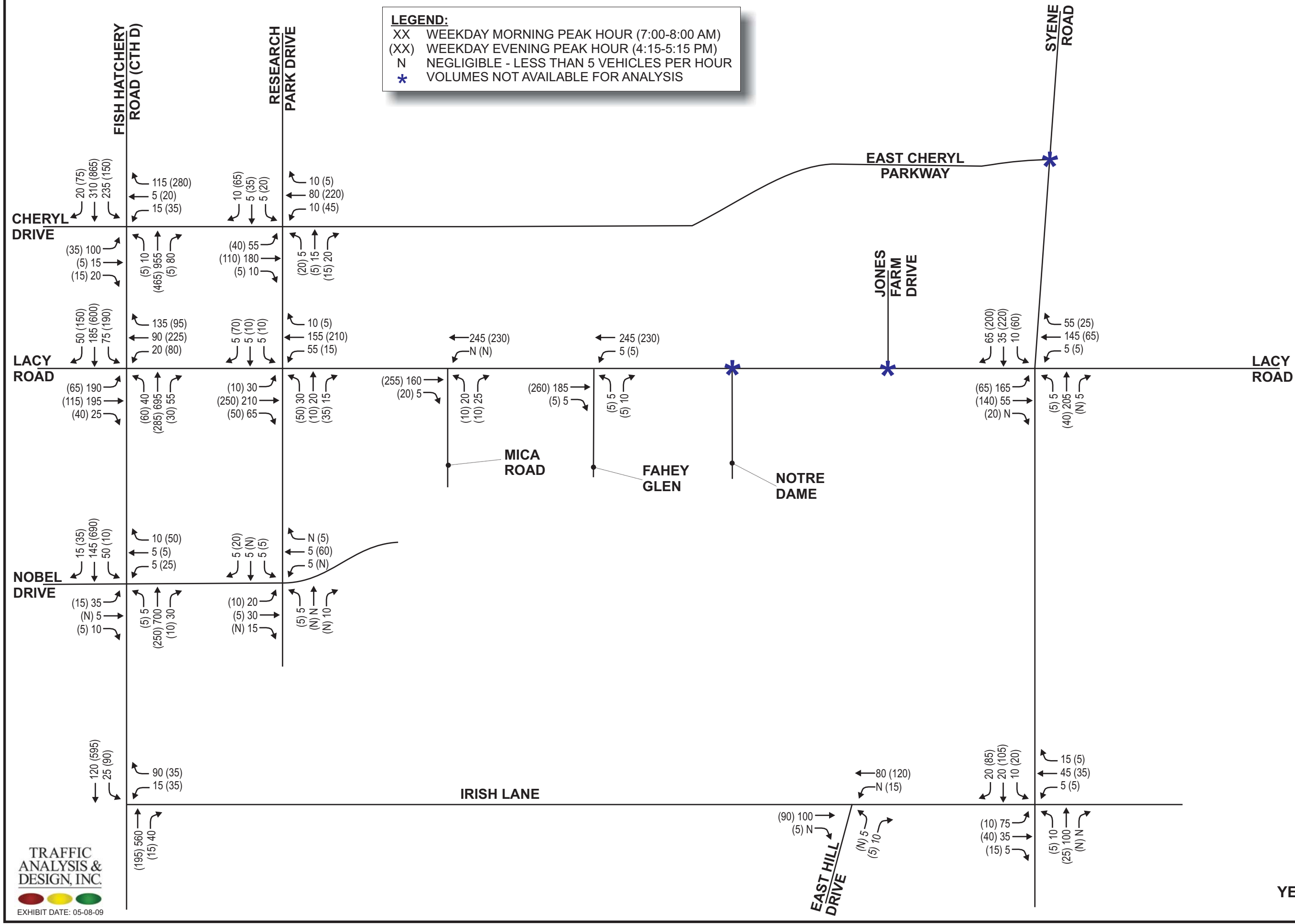
LEGEND:

- TRAFFIC SIGNAL
- Ⓡ ROUNDABOUT
- ⊥ STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- XX' ANTICIPATED TURN-BAY LENGTH (IN FEET)
- CONT LANE IS CONTINUOUS TO UPSTREAM INTERSECTION
- FOUR-LANE CROSS-SECTION





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
* VOLUMES NOT AVAILABLE FOR ANALYSIS



**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 & 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	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.

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

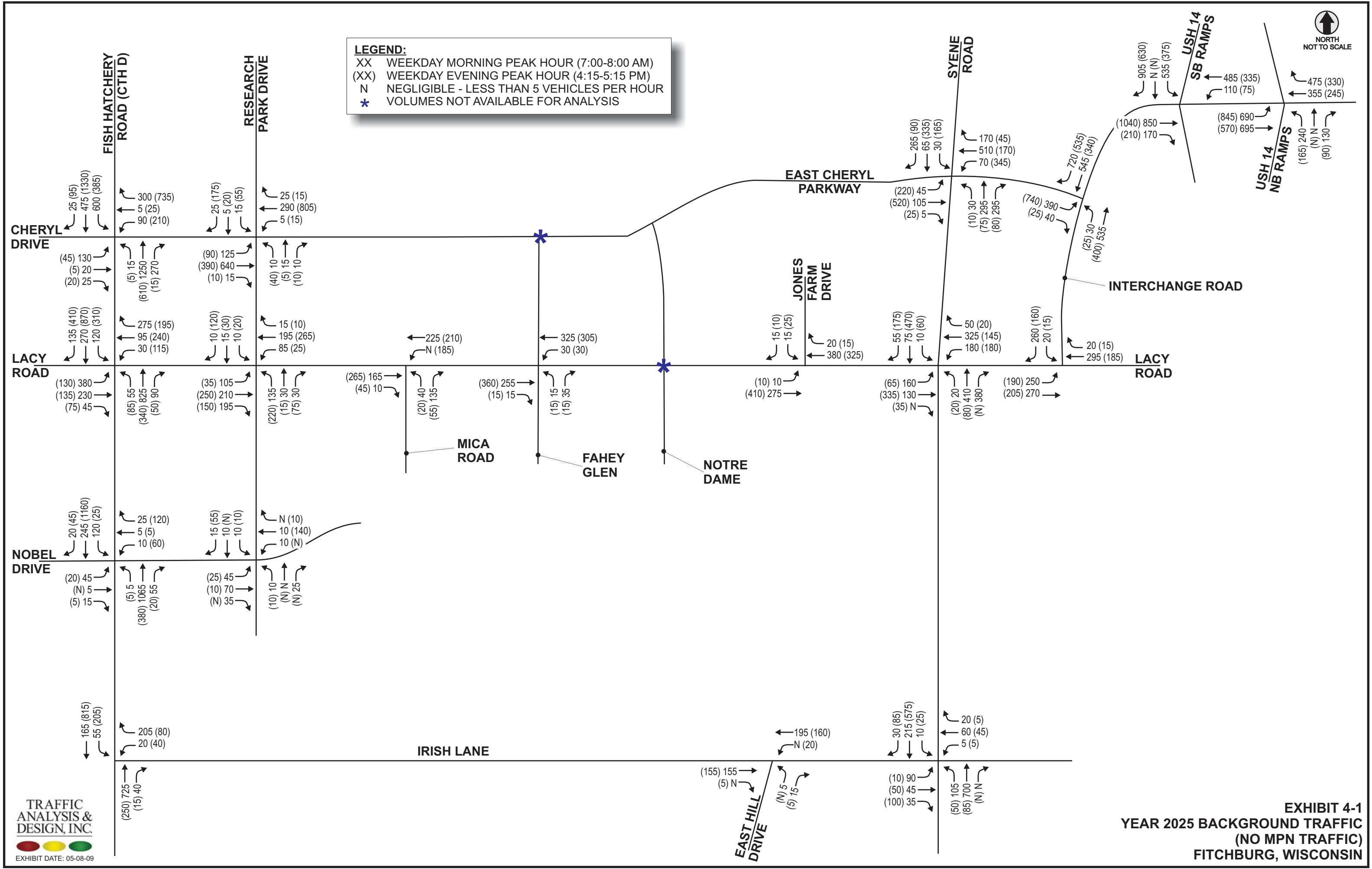
the Lacy Road intersection with Syene Road, some traffic from Interchange Road and Lacy Road were assumed reassign to southbound on Nobel Drive to make a westbound left-turn at the Nobel Drive intersection with Syene Road. As another example, to obtain volumes that more closely resemble MPO volumes, 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](#).

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
* VOLUMES NOT AVAILABLE FOR ANALYSIS



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
* VOLUMES NOT AVAILABLE FOR ANALYSIS

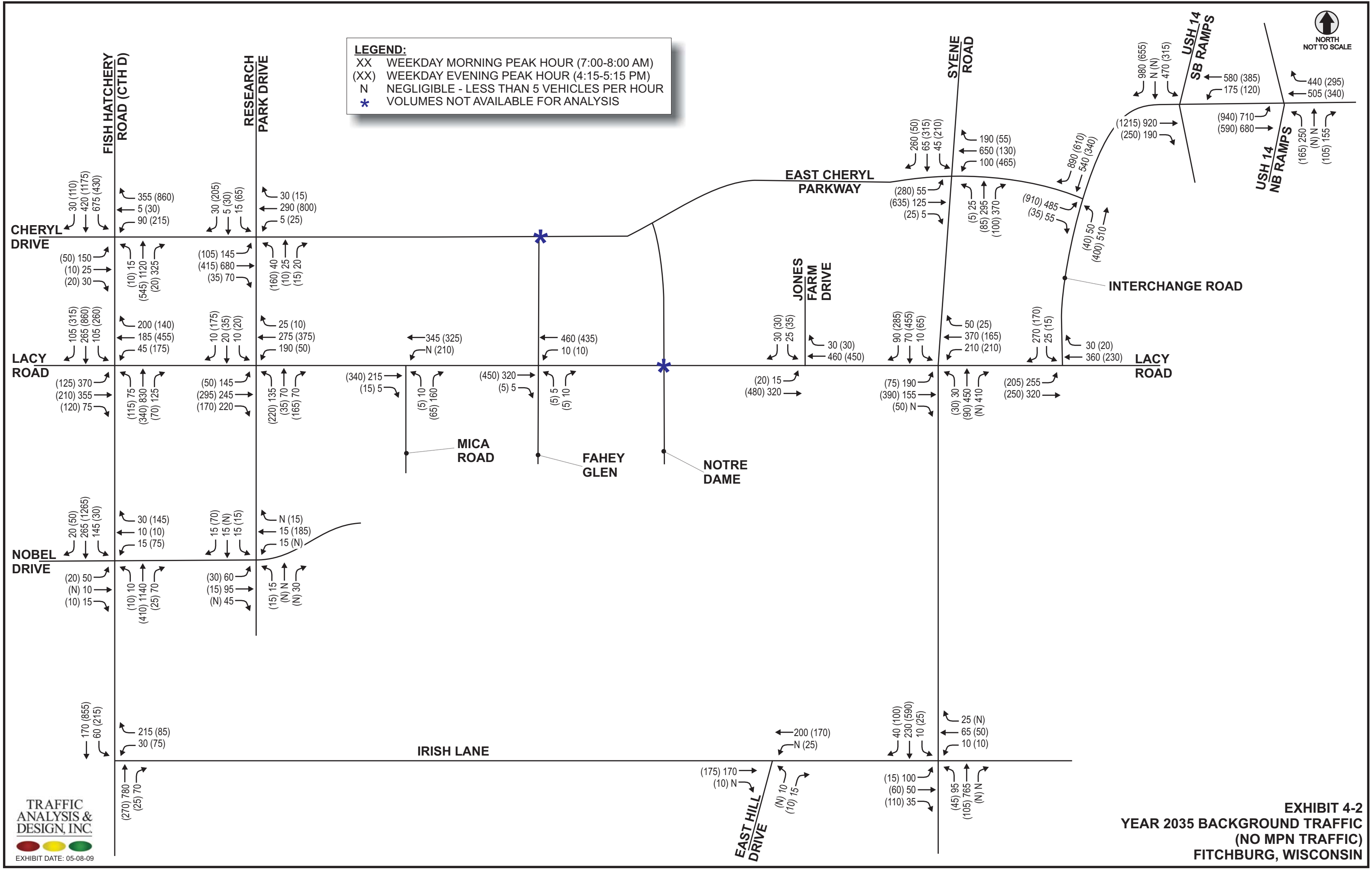


EXHIBIT 4-2
YEAR 2035 BACKGROUND TRAFFIC
(NO MPN TRAFFIC)
FITCHBURG, WISCONSIN

1

Full Build MPN Trip Generation Table - Total Trips with ITE FCE

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	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".

3

Year 2035 Full Build Total Trips by Area

Percent Complete	Parcel No.	Weekday Daily	AM Peak			PM Peak		
			In	Out	Total	In	Out	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

2

Full Build MPN Trip Generation Table - Total Trips with Equivalent Trip Rates due to FCE

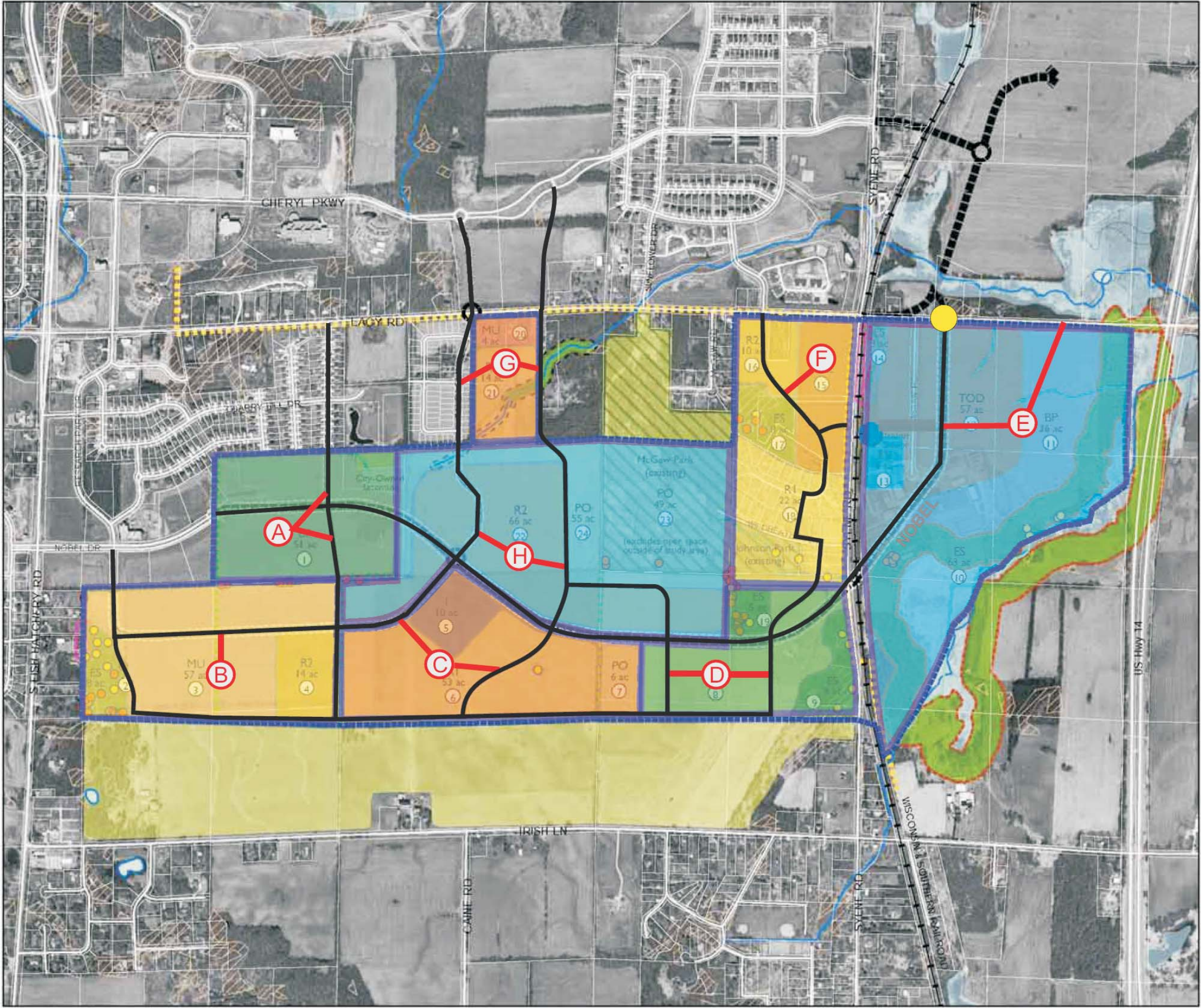
Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Business Park	770	1345.4 x 1,000 SF	15,210 (11.31)	1,535 (84%)	290 (16%)	1,825 (1.36)	380 (23%)	1,270 (77%)	1,650 (1.23)
General Office	710	832.5 x 1,000 SF	6,820 (8.193)	900 (88%)	120 (12%)	1,020 (1.23)	170 (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

4

Year 2025 Phase One & Phase Two Build-Out Total Trips by Area

Percent Complete	Area Number:	Weekday Daily	AM Peak			PM Peak		
			In	Out	Total	In	Out	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.



Year 2025 Trip Generation Table - TAZ A

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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

Year 2025 Trip Generation Table - TAZ E

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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

Year 2035 Trip Generation Table - TAZ A

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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			PM Peak		
				In	Out	Total	In	Out	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

Year 2035 Trip Generation Table - TAZ E

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	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

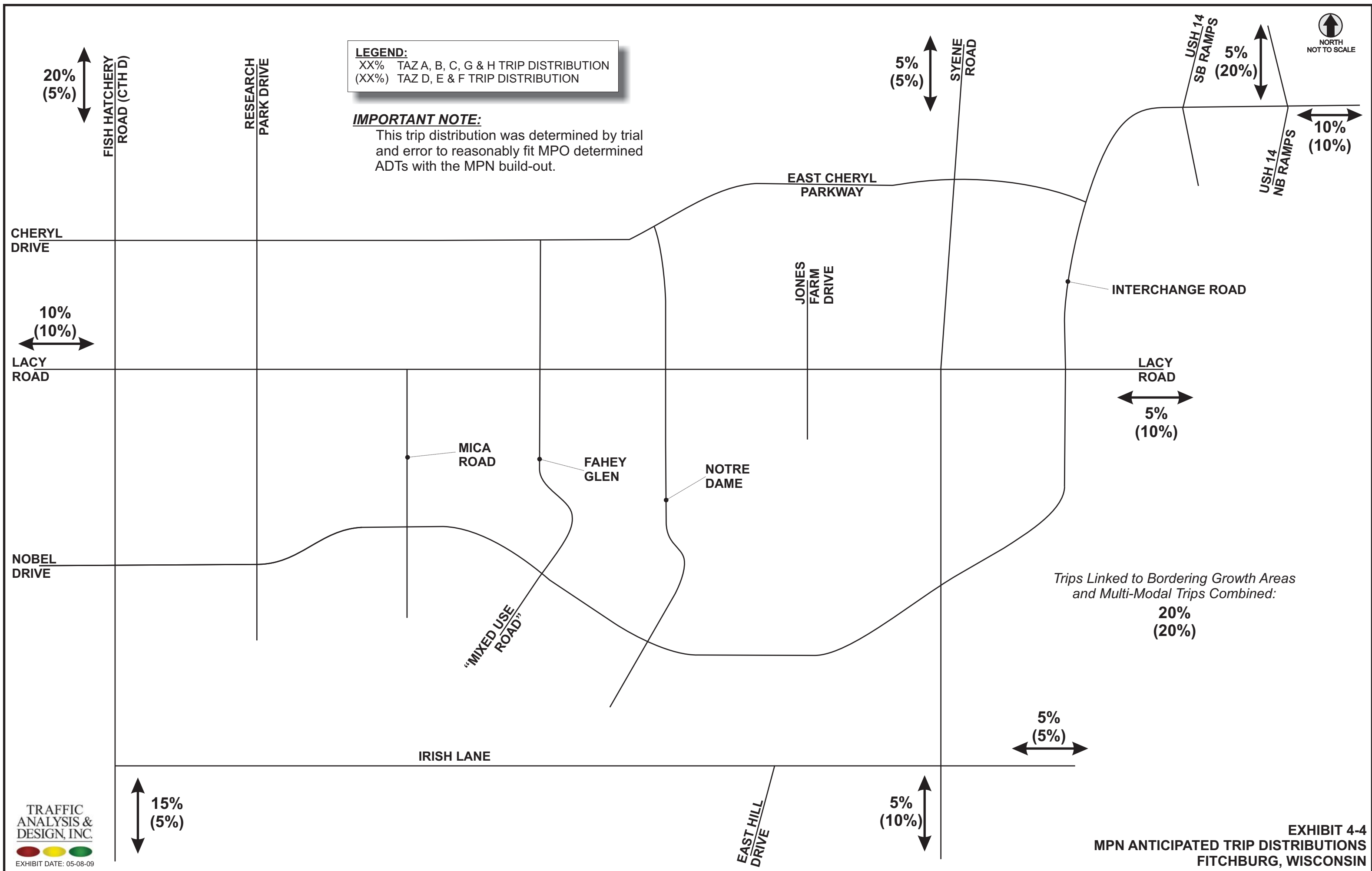
Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
General Office	710	90.2 x 1,000 SF	740 (8.19)	100 (88%)	15 (12%)	115 (1.23)	20 (17%)	90 (83%)	110 (1.21)
Retail	820	23.2 x 1,000 SF	990 (42.94)	15 (61%)	10 (39%)	25 (1.03)	40 (48%)	45 (52%)	85 (3.75)
Single-Family 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

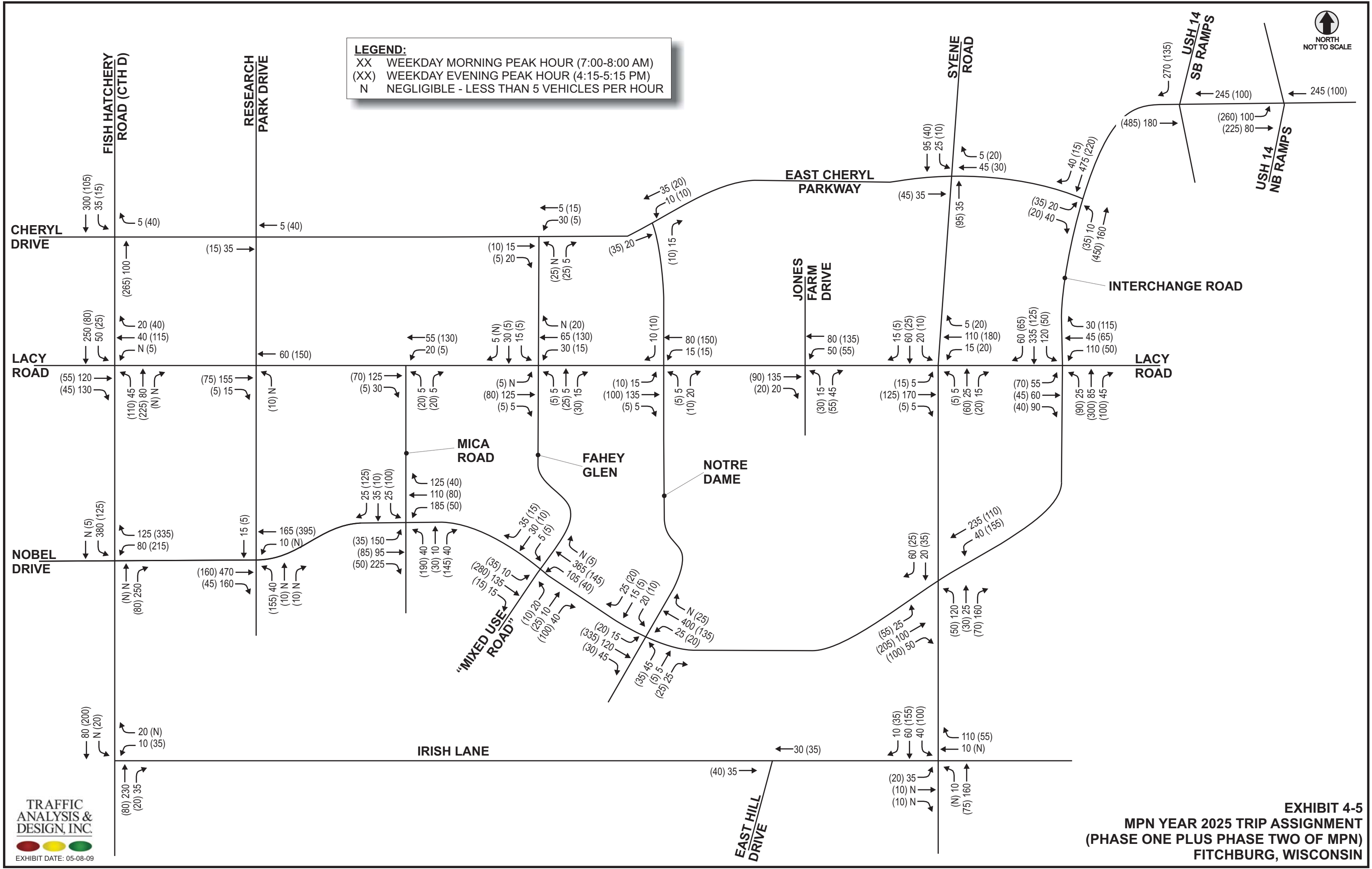
Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
General Office	710	30.9 x 1,000 SF	250 (8.19)	30 (88%)	0 (12%)	30 (1.23)	5 (17%)	30 (83%)	35 (1.21)
Single-Family Housing (R-1)	210	19 Units	180 (9.57)	5 (25%)	10 (75%)	15 (0.75)	15 (63%)	5 (37%)	20 (1.01)
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

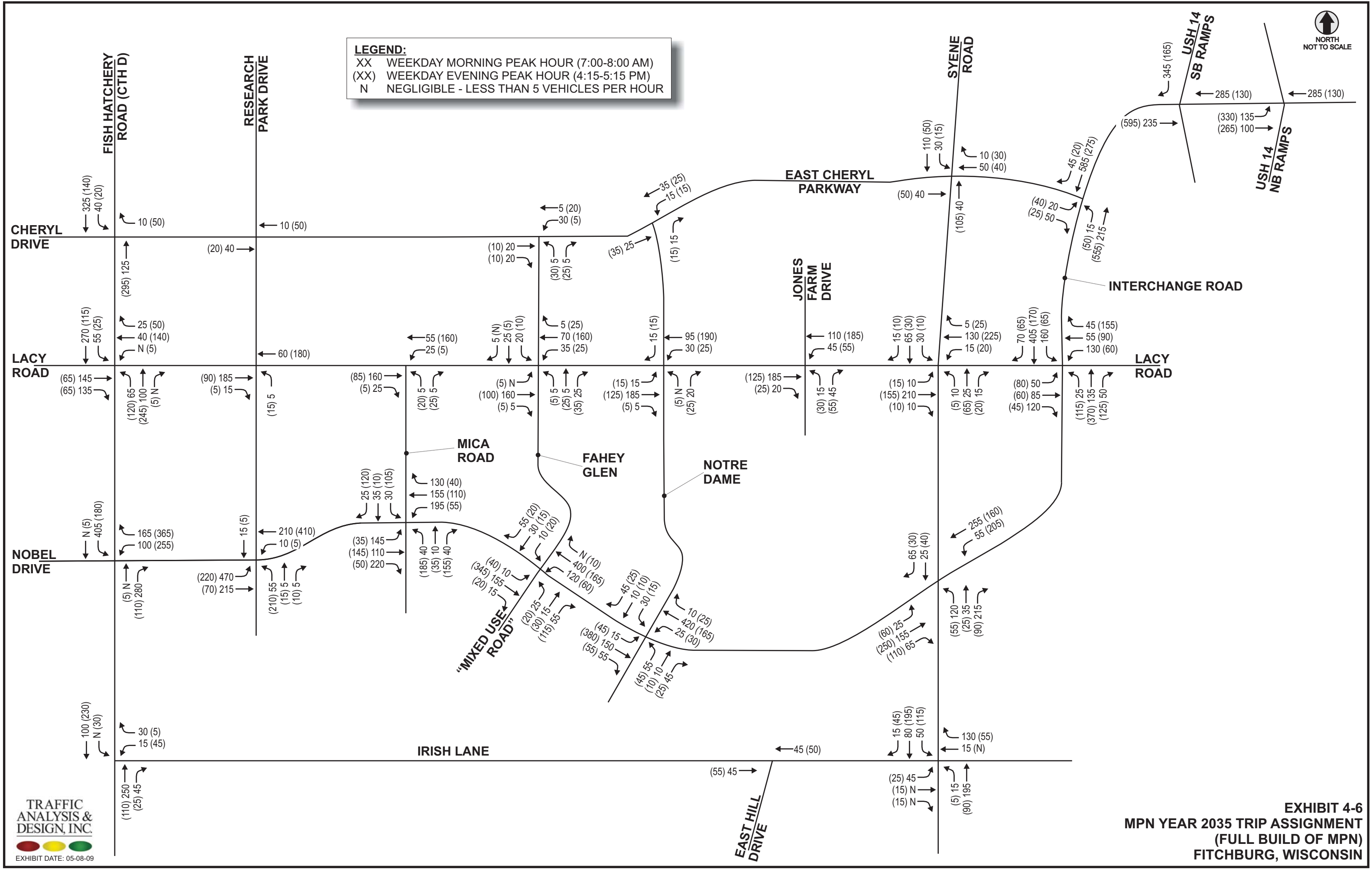
Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Apartments/Rental (R-2)	220	188 Units	1,180 (6.27)	20 (20%)	75 (80%)	95 (0.50)	70 (65%)	40 (35%)	110 (0.58)
Condominiums (R-2)	230	281 Units	1,300 (4.64)	20 (17%)	80 (83%)	100 (0.33)	80 (67%)	45 (33%)	125 (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



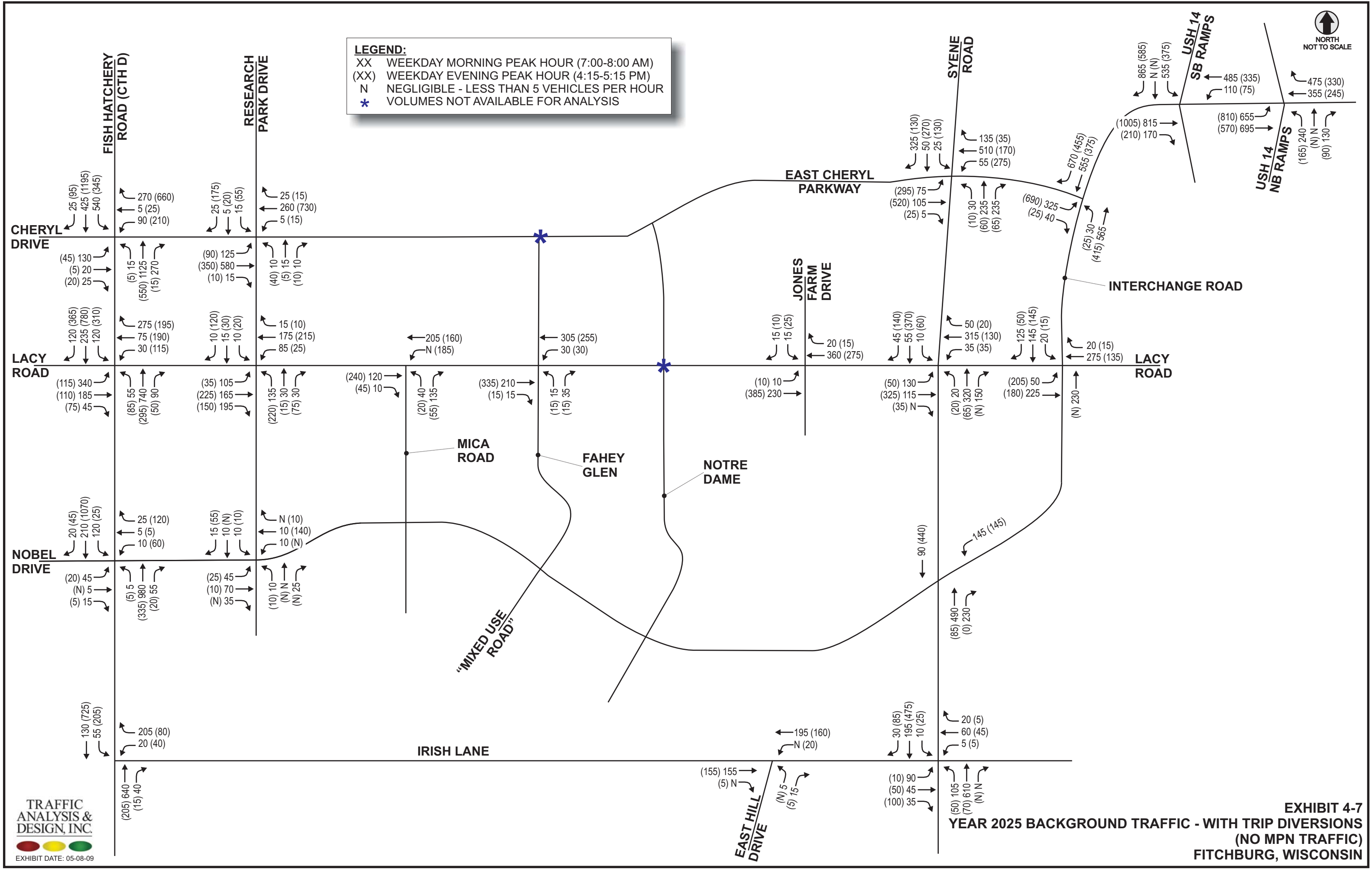
LEGEND:
XX WEEKDAY MORNING PEAK HOUR (7:00-8:00 AM)
(XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR



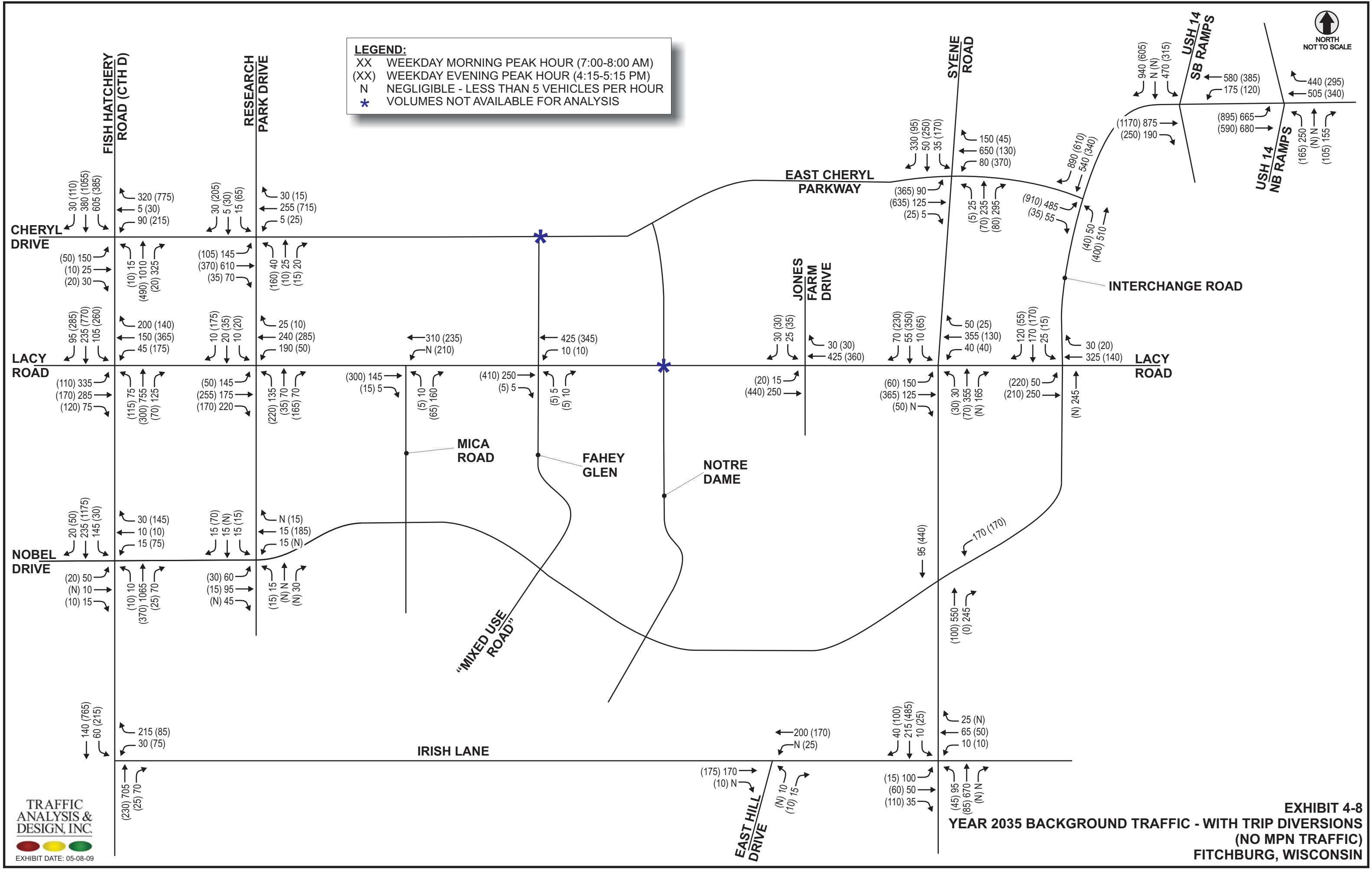
LEGEND:
XX WEEKDAY MORNING PEAK HOUR (7:00-8:00 AM)
(XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR



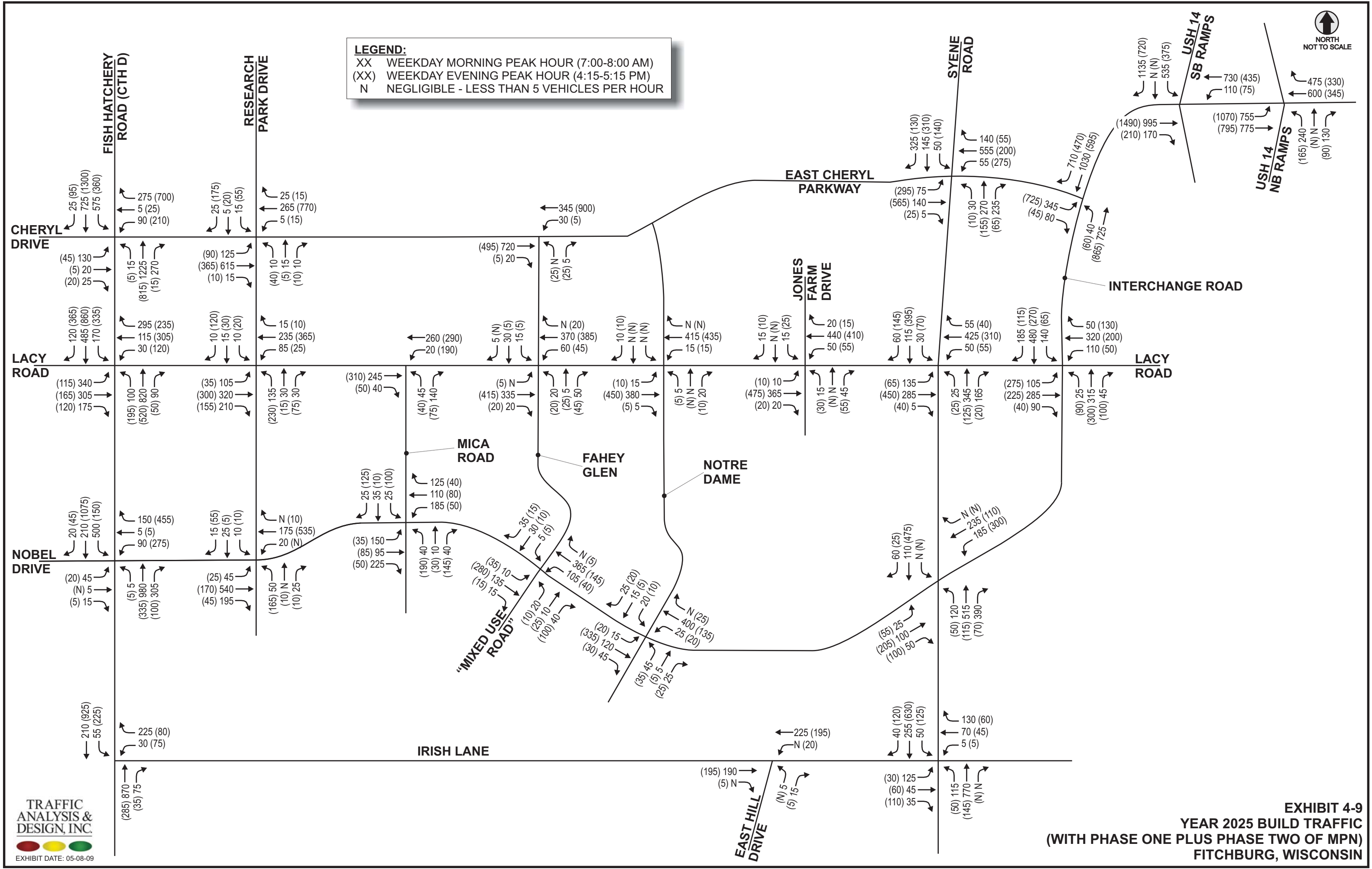
LEGEND:
 XX WEEKDAY MORNING PEAK HOUR (7:00-8:00 AM)
 (XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
 N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR
 * VOLUMES NOT AVAILABLE FOR ANALYSIS



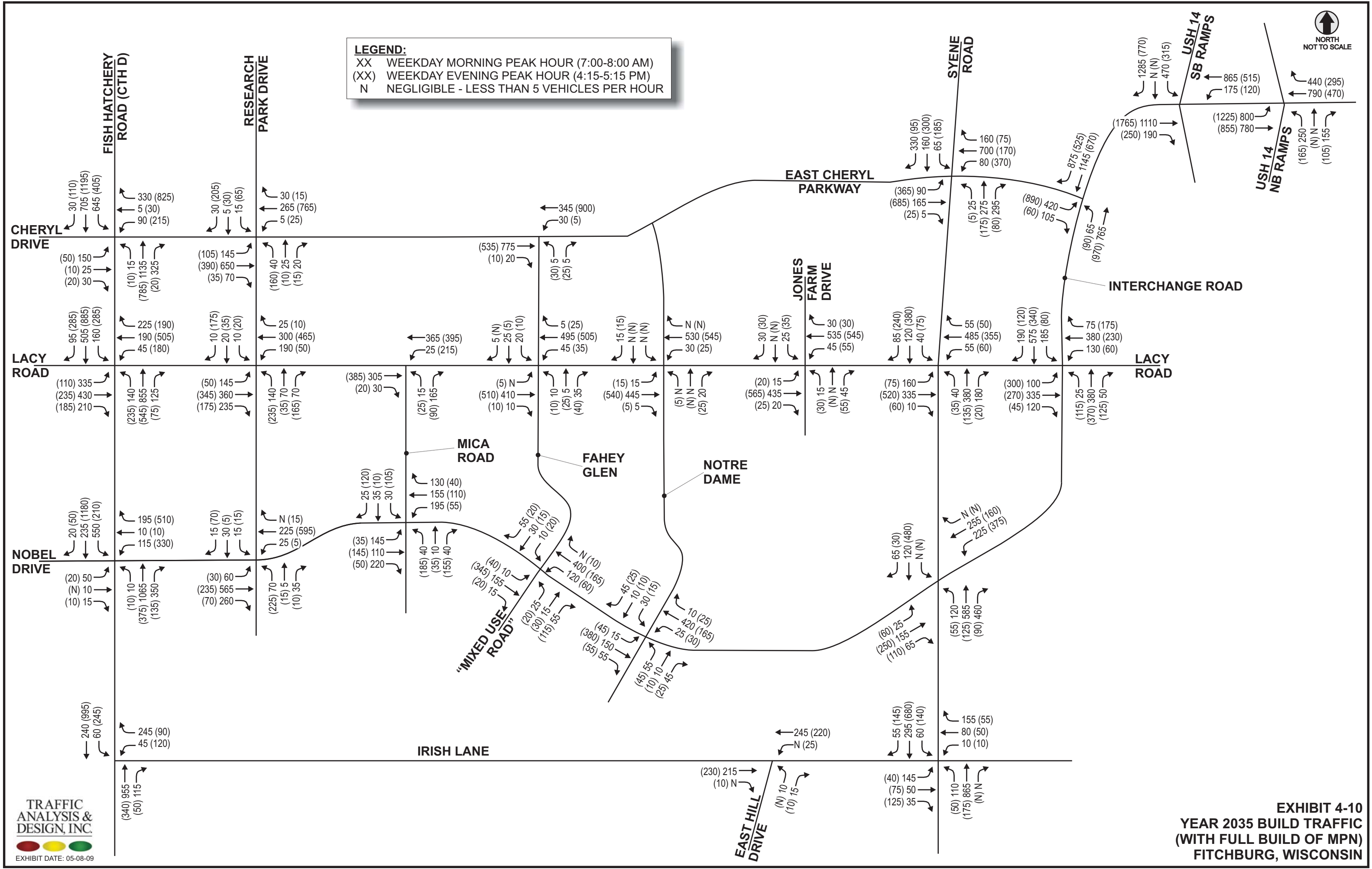
LEGEND:
 XX WEEKDAY MORNING PEAK HOUR (7:00-8:00 AM)
 (XX) WEEKDAY EVENING PEAK HOUR (4:15-5:15 PM)
 N NEGLIGIBLE - LESS THAN 5 VEHICLES PER HOUR
 * VOLUMES NOT AVAILABLE FOR ANALYSIS



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



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



Average Daily Traffic Forecasts

Location	(No MPN)			(With MPN)	
	Existing	2025 Back'd	2035 Back'd	2025 Build	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.

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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

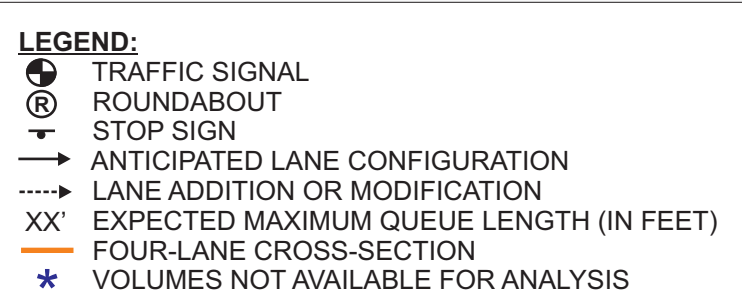
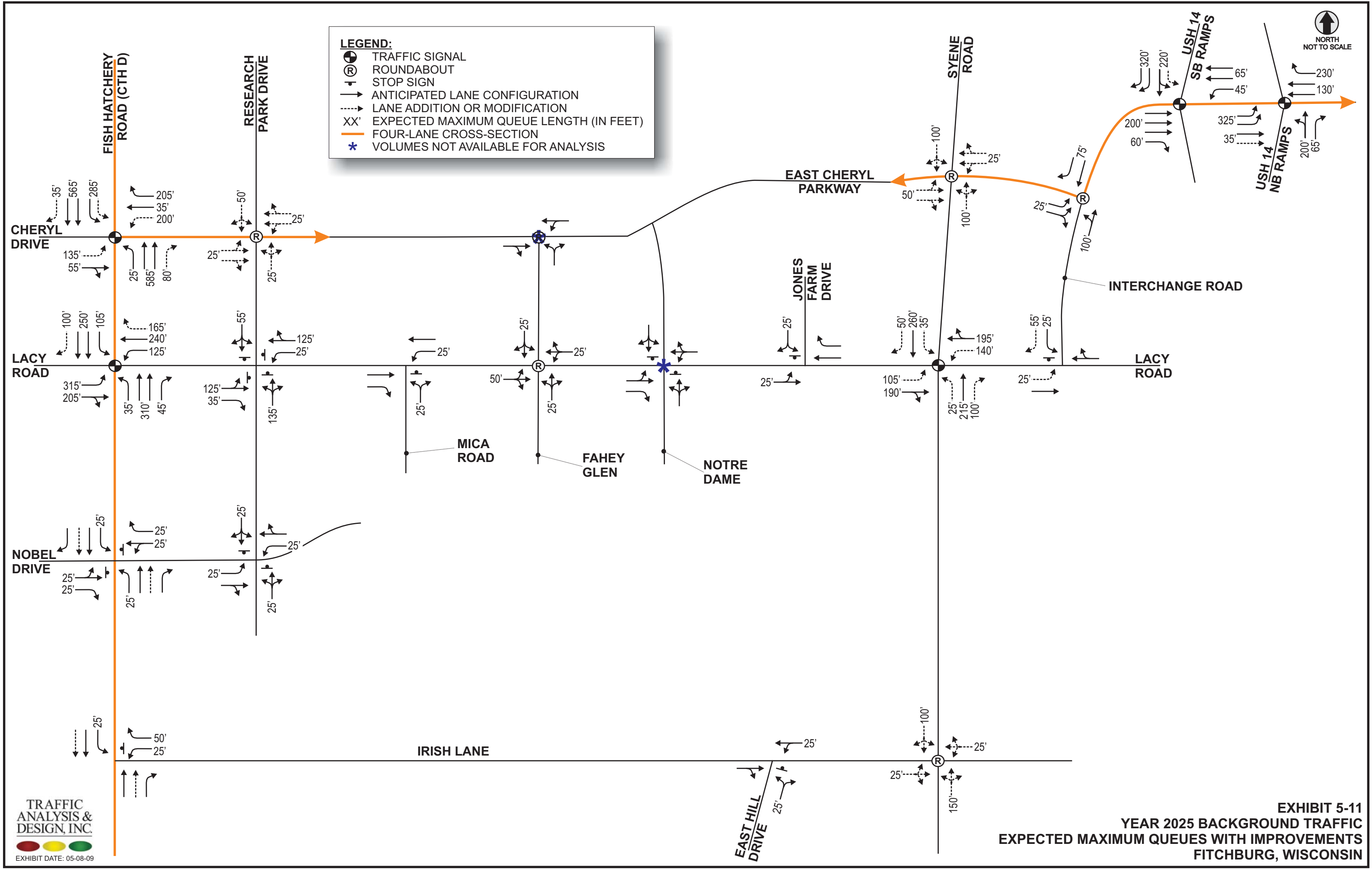


**EXHIBIT 5-10
YEAR 2008 EXISTING TRAFFIC
EXPECTED MAXIMUM QUEUES WITH IMPROVEMENTS
FITCBURG, WISCONSIN**

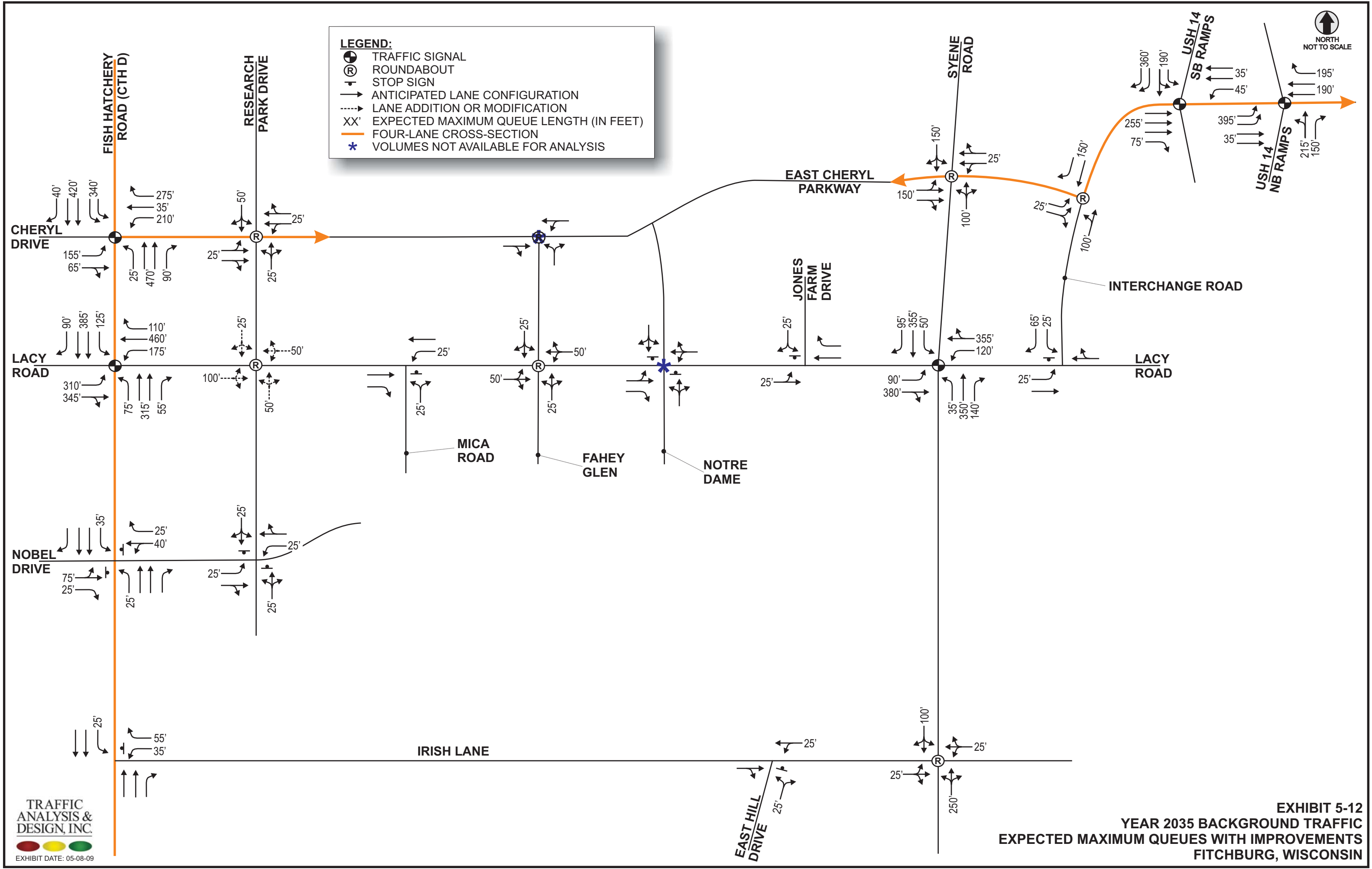
LEGEND:

- 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



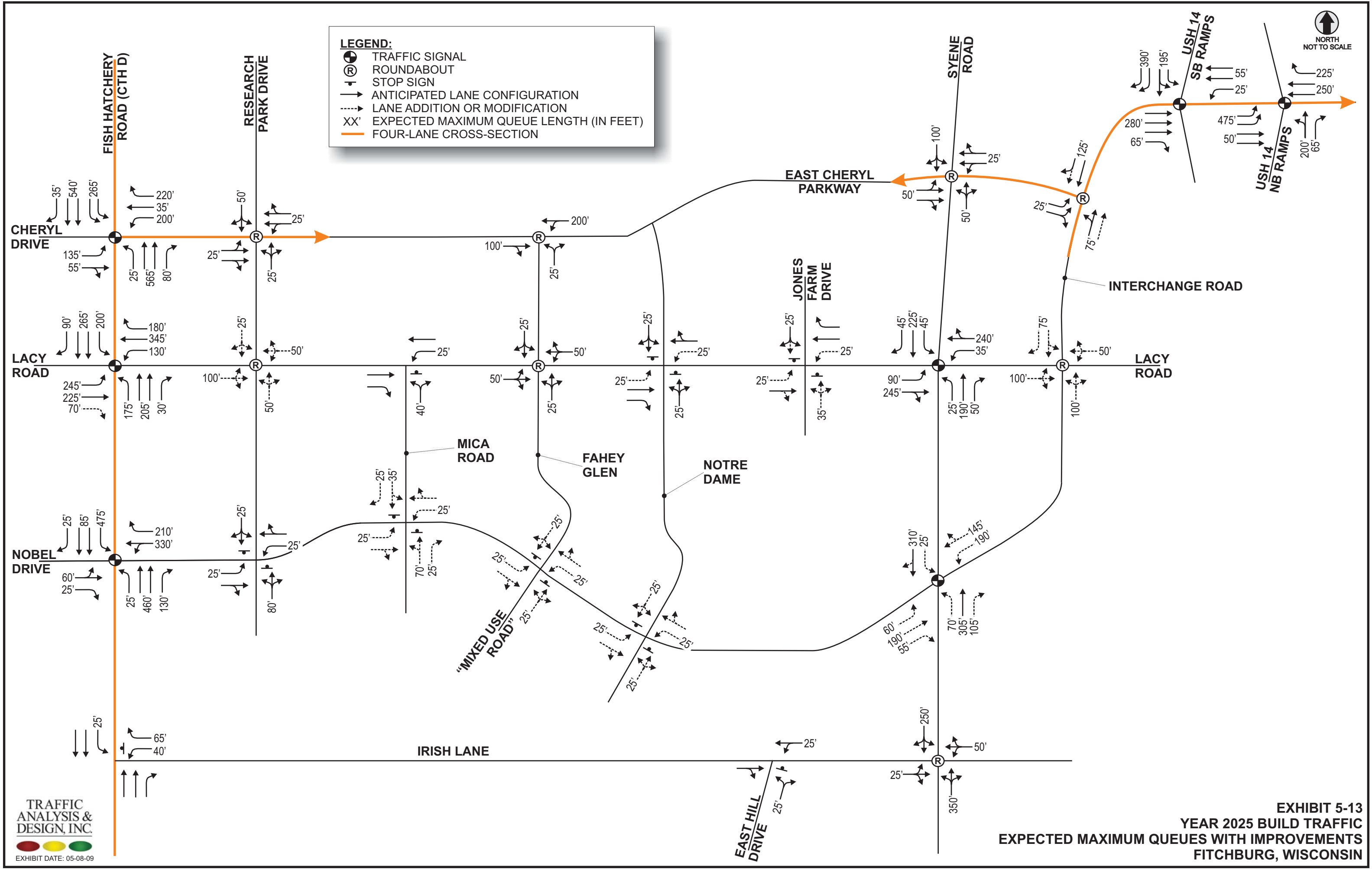
LEGEND:

- 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



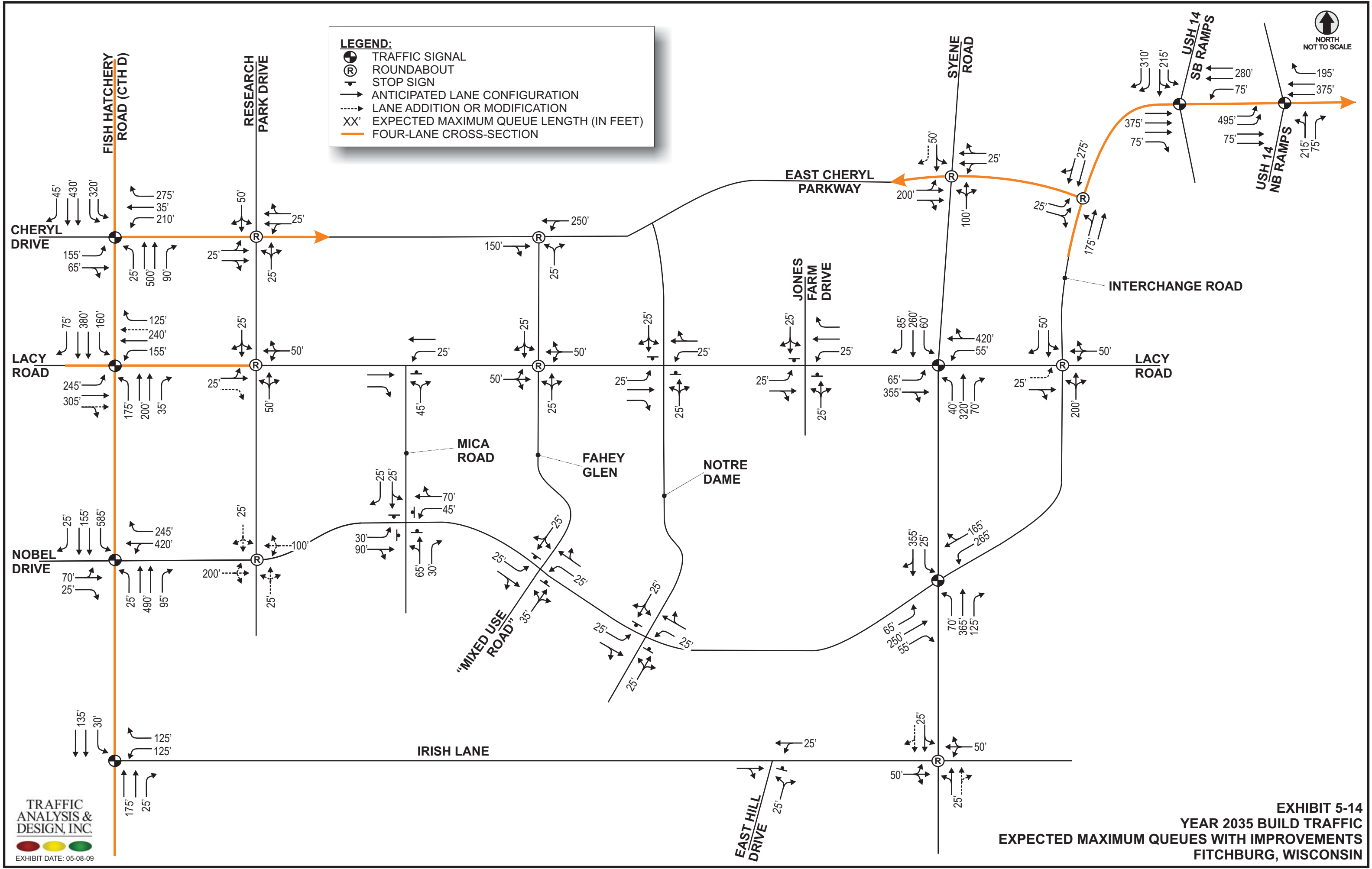
LEGEND:

- TRAFFIC SIGNAL
- Ⓜ ROUNDABOUT
- ⊥ STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR MODIFICATION
- XX' EXPECTED MAXIMUM QUEUE LENGTH (IN FEET)
- FOUR-LANE CROSS-SECTION



LEGEND:

- TRAFFIC SIGNAL
- Ⓜ ROUNDABOUT
- Ⓢ STOP SIGN
- ANTICIPATED LANE CONFIGURATION
- LANE ADDITION OR MODIFICATION
- XX' EXPECTED MAXIMUM QUEUE LENGTH (IN FEET)
- FOUR-LANE CROSS-SECTION



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 2035 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-foot 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	↓				←				↑				→				Total Vehicle Volumes
Friday, May 30, 2008	Fish Hatchery From North				Irish Lane From East				Fish Hatchery From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	0	28	3	0	15	0	7	0	6	105	0	0	0	0	0	0	164
7:00 AM	0	25	2	0	19	0	1	0	10	134	0	0	0	0	0	0	191
7:15 AM	0	43	8	0	23	0	4	0	10	153	0	0	0	0	0	0	241
7:30 AM	0	24	13	0	32	0	4	0	12	167	0	0	0	0	0	0	252
7:45 AM	0	120	26	0	89	0	16	0	38	559	0	0	0	0	0	0	848
Peak Hour Volume																	
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	↓				←				↑				→				Total Vehicle Volumes
Monday, June 09, 2008	Fish Hatchery From North				Irish Lane From East				Fish Hatchery From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
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
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.

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N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Irish

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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

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N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Irish

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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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File Name : FishHatchery-Irish

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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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N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Irish

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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	↓				←				↑				→				Total Vehicle Volumes
Thursday, May 29, 2008	Fish Hatchrey From North				Lacy Road From East				Fish Hatchrey From South				Lacy Road From West				
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	
7:15 AM	13	32	16	0	34	18	2	0	14	171	7	1	4	28	49	1	
7:30 AM	14	43	17	0	40	25	6	0	20	204	14	0	8	64	63	0	
7:45 AM	15	59	25	0	39	31	7	0	13	186	11	1	6	68	44	0	
Peak Hour Volume	52	184	73	1	132	92	20	0	55	695	42	2	24	193	190	1	
U-Turn Hourly Volume				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	
By Approach	310				240				790				410			1,750	

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Wednesday, May 28, 2008	Fish Hatchrey From North				Lacy Road From East				Fish Hatchrey From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	31	106	55	0	19	38	11	0	7	65	11	0	7	22	14	0	
4:30 PM	35	159	36	1	33	57	14	0	8	67	12	0	11	29	16	0	
4:45 PM	43	197	49	2	22	63	29	0	7	74	14	1	11	36	14	2	
5:00 PM	39	139	50	1	22	65	25	0	7	80	21	0	13	27	22	0	
Peak Hour Volume	148	601	190	4	96	223	79	0	29	286	58	1	42	114	66	2	
U-Turn Hourly Volume																	
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	
By Approach	940				400				375				220				1,935

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

Page No : 1

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

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Lacy

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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

Start Date : 5/29/2008

Page No : 1

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	↓				←				↑				→				Total Vehicle Volumes
Thursday, May 29, 2008	Fish Hatchery From North				Nobel Drive From East				Fish Hatchery From South				Nobel Drive From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	4	42	10	1	1	1	0	0	5	139	1	0	1	0	10	0	
7:00 AM	3	28	5	1	4	1	1	0	6	164	2	1	3	0	8	1	
7:15 AM	3	36	12	1	2	0	1	0	5	214	0	0	3	1	11	0	
7:30 AM	4	39	21	0	1	0	3	0	14	183	0	1	1	1	8	0	
7:45 AM	14	145	48	3	8	2	5	0	30	700	3	2	8	2	37	1	
Peak Hour Volume																	
U-Turn Hourly Volume				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%		
% 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%		
% 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%		
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		
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	
By Approach	210				15				735				45				1,005

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Monday, June 02, 2008	Fish Hatchery From North				Nobel Drive From East				Fish Hatchery From South				Nobel Drive From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
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

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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
Cedarburg, WI 53012

File Name : FishHatchery-Nobel

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Nobel

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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.

N36 W7505 Buchanan Street
Cedarburg, WI 53012

File Name : FishHatchery-Nobel

Site Code : 00000000

Start Date : 5/29/2008

Page No : 1

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	↓				←				↑				→				Total Vehicle Volumes
Thursday, May 29, 2008	Fish Hatchery From North				Cheryl From East				Fish Hatchery From South				Cheryl From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	6	68	25	0	9	1	2	2	10	167	2	0	3	1	24	0	
7:00 AM	7	65	54	1	21	1	0	0	13	237	0	4	7	6	32	1	
7:15 AM	5	67	66	0	30	1	1	0	25	300	5	1	4	2	23	2	
7:30 AM	2	111	91	0	56	1	10	3	31	252	2	1	5	4	21	0	
7:45 AM	20	311	236	1	116	4	13	5	79	956	9	6	19	13	100	3	
Peak Hour Volume																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	
By Approach	565				135				1,045				135				1,880

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Wednesday, June 18, 2008	Fish Hatchery From North				Cheryl From East				Fish Hatchery From South				Cheryl From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	12	190	40	0	58	5	9	0	0	109	0	1	1	1	6	4	
4:30 PM	16	225	26	0	63	6	4	0	4	129	1	3	4	0	14	2	
4:45 PM	24	193	36	2	69	8	10	0	1	108	3	2	3	4	10	5	
5:00 PM	22	255	49	0	89	3	13	0	1	117	0	7	4	1	6	6	
Peak Hour Volume	74	863	151	2	279	22	36	0	6	463	4	13	12	6	36	17	
U-Turn Hourly Volume																	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%		
By Approach	2.0%				1.8%				3.8%				3.7%				2.4%
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		
By Approach	0.83				0.80				0.88				0.75				0.87
HOURLY VOLUME-ROUNDED	75	865	150	2	280	20	35	0	5	465	5	13	10	5	35	17	
By Approach	1,090				335				475				50				1,950

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

Page No : 1

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

Page No : 1

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

Start Date : 5/29/2008

Page No : 1

Groups Printed- Bus Light Med Trucks

Start Time	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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

Start Date : 5/29/2008

Page No : 1

Groups Printed- Heavy Trucks

Start Time	FISH HATCHERY From North				CHERYL From East				FISH HATCHERY From South				CHERYL From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Wednesday, June 11, 2008	East Hill Drive From North				Irish Lane From East				East Hill Drive From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
7:00 AM	0	0	0	0	0	17	0	0	4	0	2	0	0	18	0	0	
7:15 AM	0	0	0	0	0	17	0	0	1	0	1	0	0	18	0	0	
7:30 AM	0	0	0	0	0	25	0	0	4	0	1	0	0	35	0	0	
7:45 AM	0	0	0	0	0	20	1	0	2	0	0	0	1	29	0	0	
Peak Hour Volume	0	0	0	0	0	79	1	0	11	0	4	0	1	100	0	0	
U-Turn Hourly Volume																	
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	
By Approach	0				80				15				100				195

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Wednesday, June 04, 2008	East Hill Drive From North				Irish Lane From East				East Hill Drive From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
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
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

Page No : 1

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

Page No : 1

Groups Printed- cars

Start Time	E HILL DR From North				IRISH LN From East				E HILL DR From South				IRISH LN From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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

Page No : 1

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

Page No : 1

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	↓				←				↑				→				Total Vehicle Volumes
Friday, June 06, 2008	Syene Road From North				Irish Lane From East				Syene Road From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
7:00 AM	6	3	1	0	3	10	0	0	0	17	1	0	1	5	12	0	
7:15 AM	1	3	6	0	3	10	0	0	0	29	2	0	1	11	18	0	
7:30 AM	5	7	3	0	5	9	1	0	0	25	1	0	0	9	17	0	
7:45 AM	6	8	0	0	5	14	1	0	1	30	5	0	0	10	29	0	
Peak Hour Volume	18	21	10	0	16	43	2	0	1	101	9	0	2	35	76	0	
U-Turn Hourly Volume																	
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%		
% 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%		
% 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%		
By Approach	14.3%				4.9%				3.6%				2.6%				5.1%
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		
By Approach	0.82				0.76				0.77				0.72				0.77
HOURLY VOLUME-ROUNDED	20	20	10	0	15	45	0	0	0	100	10	0	0	35	75	0	
By Approach	50				60				110				110				330

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Thursday, June 05, 2008	Syene Road From North				Irish Lane From East				Syene Road From South				Irish Lane From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	14	13	5	0	0	7	2	0	0	6	2	0	2	7	1	0	
4:30 PM	26	24	4	0	1	8	1	0	0	5	1	0	3	6	4	0	
4:45 PM	24	26	4	0	4	11	0	0	0	6	1	0	2	10	6	0	
5:00 PM	20	40	9	0	2	7	0	0	0	9	0	0	6	15	1	0	
Peak Hour Volume	84	103	22	0	7	33	3	0	0	26	4	0	13	38	12	0	
U-Turn Hourly Volume																	
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	
By Approach	210				45				30				65				350

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

Page No : 1

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

Start Time	SYENE RD From North				IRISH LN From East				SYENE RD From South				IRISH LN From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Tuesday, June 10, 2008	Fahey Glen From North				Lacy Road From East				Fahey Glen From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
7:00 AM	0	0	0	0	0	36	0	0	2	0	1	0	2	40	0	0	
7:15 AM	0	0	0	0	0	55	0	0	0	0	2	0	1	47	0	0	
7:30 AM	0	0	0	0	0	77	2	0	3	0	1	0	0	47	0	0	
7:45 AM	0	0	0	0	0	78	3	0	3	0	1	0	2	51	0	0	
Peak Hour Volume	0	0	0	0	0	246	5	0	8	0	5	0	5	185	0	0	
U-Turn Hourly Volume				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%		
% 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%		
% 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%		
By Approach	0.0%				5.2%				7.7%				0.5%			3.3%	
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		
By Approach	0				0.77				0.81				0.90			0.82	
HOURLY VOLUME-ROUNDED	0	0	0	0	0	245	5	0	10	0	5	0	5	185	0	0	
By Approach	0				250				15				190			455	

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Thursday, June 05, 2008	Fahey Glen From North				Lacy Road From East				Fahey Glen From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	0	0	0	0	0	37	4	0	1	0	1	0	1	54	0	0	
4:30 PM	0	0	0	0	0	43	0	0	0	0	0	0	1	64	0	0	
4:45 PM	0	0	0	0	0	74	1	0	2	0	1	0	1	60	0	0	
5:00 PM	0	0	0	0	0	74	0	0	1	0	3	0	4	84	0	0	
Peak Hour Volume	0	0	0	0	0	228	5	0	4	0	5	0	7	262	0	0	
U-Turn Hourly Volume																	
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	
By Approach	0				235				10				265				510

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

Page No : 1

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

Start Time	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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

Page No : 1

Groups Printed- Bus Light Med Trucks

Start Time	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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

Page No : 1

Groups Printed- Heavy Trucks

Start Time	FAHEY GLEN From North				LACY ROAD From East				FAHEY GLEN From South				LACY ROAD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Tuesday, June 10, 2008	Mica Road From North				Lacy Road From East				Mica Road From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
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																	
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	↓				←				↑				→				Total Vehicle Volumes
Tuesday, June 10, 2008	Mica Road From North				Lacy Road From East				Mica Road From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	0	0	0	0	0	44	3	0	4	0	1	0	3	59	0	0	
4:30 PM	0	0	0	0	0	62	1	0	3	0	3	0	5	58	0	0	
4:45 PM	0	0	0	0	0	56	7	0	0	0	1	1	4	53	0	0	
5:00 PM	0	0	0	0	0	68	5	0	1	0	3	1	6	85	0	0	
Peak Hour Volume	0	0	0	0	0	230	16	0	8	0	8	2	18	255	0	0	
U-Turn Hourly Volume																	
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		
By Approach	0				0.84				0.67				0.75				0.80
HOURLY VOLUME-ROUNDED	0	0	0	0	0	230	15	0	10	0	10	2	20	255	0	0	
By Volume	0				245				20				275				540

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

Start Time	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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

Start Time	MICA ROAD From North				LACY ROAD From East				MICA ROAD From South				LACY ROAD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Wednesday, June 04, 2008	Syene Road From North				Lacy Road From East				Syene Road From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	9	7	2	0	7	24	0	0	1	42	3	0	1	15	30	0	
7:00 AM	17	6	3	1	14	32	0	0	0	51	2	0	0	9	43	0	
7:15 AM	18	12	3	0	15	35	2	0	1	51	2	0	0	17	50	0	
7:30 AM	21	8	4	0	17	52	0	0	1	62	0	0	0	13	44	0	
7:45 AM	65	33	12	1	53	143	2	0	3	206	7	0	1	54	167	0	
Peak Hour Volume																	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	
By Approach	110				200				215				220				745

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Thursday, June 12, 2008	Syene Road From North				Lacy Road From East				Syene Road From South				Lacy Road From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	34	41	9	0	8	16	0	0	0	5	3	0	2	25	16	0	
4:30 PM	52	43	15	0	1	14	0	1	0	13	1	0	7	38	16	1	
4:45 PM	47	61	17	0	8	18	1	0	0	11	2	0	7	24	13	0	
5:00 PM	65	74	20	0	6	17	2	0	1	12	1	2	2	55	19	4	
Peak Hour Volume	198	219	61	0	23	65	3	1	1	41	7	2	18	142	64	5	
U-Turn Hourly Volume																	
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	
By Approach	480				95				45				225				845

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

Start Time	SYENE RD From North				LACY RD From East				SYENE RD From South				LACY RD From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Friday, May 30, 2008	Research Park From North				Cheryl From East				Research Park From South				Cheryl From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	1	1	1	0	1	14	2	0	6	1	2	1	2	28	4	0	
7:00 AM	0	1	0	0	3	19	2	0	3	4	0	1	4	41	9	0	
7:15 AM	5	2	1	1	3	25	5	0	3	1	1	1	1	43	16	0	
7:30 AM	6	0	0	0	2	24	1	0	10	7	2	1	2	70	27	0	
7:45 AM	12	4	2	1	9	82	10	0	22	13	5	4	9	182	56	0	
Peak Hour Volume																	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	
By Approach	15				100				40				245				400

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Tuesday, May 27, 2008	Research Park From North				Cheryl From East				Research Park From South				Cheryl From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	10	4	3	0	1	44	4	0	3	2	2	1	3	25	8	0	
4:30 PM	17	13	2	2	0	42	14	0	3	0	5	5	0	28	7	0	
4:45 PM	15	6	6	0	0	58	10	0	2	1	7	0	2	28	13	0	
5:00 PM	21	11	7	0	1	74	15	1	5	0	6	0	2	27	11	1	
Peak Hour Volume	63	34	18	2	2	218	43	1	13	3	20	6	7	108	39	1	
U-Turn Hourly Volume																	
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	
By Approach	120				265				40				155				580

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

Start Date : 5/30/2008

Page No : 1

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	0	1	0	1	0	0	4
07:15 AM	0	0	0	0	0	1	0	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	0	1	0	2	0	0	7
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2
Total	0	2	1	1	0	3	1	0	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	0	2	0	0	4
08:15 AM	0	0	0	0	1	0	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	0	1	1	0	0	4
Total	0	1	0	0	1	2	1	0	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	0	1	0	0	3
04:15 PM	0	0	1	0	0	0	0	0	0	0	1	0	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	0	5
04:45 PM	1	0	1	0	0	1	0	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	0	13
05:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	3
05:15 PM	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	3
05:30 PM	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	0	4
05:45 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Total	0	0	2	1	0	2	0	0	0	0	2	4	0	1	0	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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Start Date : 5/30/2008

Page No : 1

Groups Printed- Heavy Trucks

Start Time	RESEARCH PARK From North				CHERYL From East				RESEARCH PARK From South				CHERYL From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
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	↓				←				↑				→				Total Vehicle Volumes
Friday, May 30, 2008	Research Park From North				Lacy From East				Research Park From South				Lacy From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	1	2	0	0	2	36	9	0	3	1	6	2	14	34	6	0	
7:00 AM	1	0	0	0	1	29	13	0	3	1	8	3	17	46	6	0	
7:15 AM	2	2	0	0	4	41	17	0	5	3	8	0	16	52	6	0	
7:30 AM	2	0	3	1	5	48	15	0	4	14	10	2	20	79	11	0	
7:45 AM	6	4	3	1	12	154	54	0	15	19	32	7	67	211	29	0	
Peak Hour Volume	13				220				66				307				
U-Turn Hourly Volume	0				0				0				0				
By Approach																	
TRUCK PERCENTAGES	0.0%	25.0%	0.0%		8.3%	1.9%	5.6%		0.0%	0.0%	0.0%		1.5%	1.4%	0.0%		
% Single Unit 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%		
% Heavy Trucks	0.0%	25.0%	0.0%		8.3%	1.9%	5.6%		0.0%	5.3%	0.0%		1.5%	2.8%	0.0%		
% Trucks (Total)	7.7%				3.2%				1.5%				2.3%				
By Approach																	
PEAK HOUR FACTORS	0.75	0.50	0.25		0.60	0.80	0.79		0.75	0.34	0.80		0.84	0.67	0.66		
Peak Hour Factor (PHF)	0.65				0.81				0.59				0.70				
By Approach																	
HOURLY VOLUME-ROUNDED	5	5	5	1	10	155	55	0	15	20	30	7	65	210	30	0	
By Approach	15				220				65				305				

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Monday, June 09, 2008	Research Park From North				Lacy From East				Research Park From South				Lacy From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
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																	
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
Cedarburg, WI 53012

File Name : ResearchPk-Lacy

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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
Cedarburg, WI 53012

File Name : ResearchPk-Lacy

Site Code : 00000000

Start Date : 5/30/2008

Page No : 1

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	↓				←				↑				→				Total Vehicle Volumes
Tuesday, June 10, 2008	Research Park From North				Nobel From East				Research Park From South				Nobel From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time	1	0	0	0	0	1	0	1	0	0	0	5	4	5	4	0	
7:00 AM	1	4	2	1	0	0	2	1	1	0	2	1	1	5	5	0	
7:15 AM	2	0	1	0	0	1	0	1	6	0	0	0	3	6	7	0	
7:30 AM	1	0	2	0	0	2	2	2	4	1	1	1	9	13	5	0	
7:45 AM	5	4	5	1	0	4	4	5	11	1	3	7	17	29	21	0	
Peak Hour Volume																	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	
By Approach	15				10				15				65				105

P.M. PEAK	↓				←				↑				→				Total Vehicle Volumes
Tuesday, June 10, 2008	Research Park From North				Nobel From East				Research Park From South				Nobel From West				
TRAFFIC VOLUMES	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
Start Time																	
4:15 PM	3	0	0	0	0	10	0	0	0	1	2	0	0	2	1	0	
4:30 PM	3	0	0	0	0	15	0	2	0	0	0	0	0	1	3	0	
4:45 PM	2	0	2	1	4	14	0	2	0	0	0	0	0	0	2	0	
5:00 PM	11	0	0	2	0	20	0	2	0	0	1	1	0	1	3	1	
Peak Hour Volume	19	0	2	3	4	59	0	6	0	1	3	1	0	4	9	1	
U-Turn Hourly Volume																	
By Approach	21				63				4				13				
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%		
% 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%		
% 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%		
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		
By Approach	0.48				0.79				0.33				0.81				
HOURLY VOLUME-ROUNDED																	
By Approach	20	0	0	3	5	60	0	6	0	0	5	1	0	5	10	1	
	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

Page No : 1

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

Page No : 1

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
Cedarburg, WI 53012

File Name : ResearchPk-Nobel

Site Code : 00000000

Start Date : 6/10/2008

Page No : 1

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

Direction	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
	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.	.	.	.	.	.

[illegible][illegible]

Detector Type/Timers

Det.	Locking Memory	Log Enable	Timers Extend	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

Detector Phase Assignment

[illegible]

Detector Cross Switching

[illegible]

TOD Weekly/Yearly

	Week of Year																	
Prog	1 1	2 1	3 1	4 1	5 1	6 1	7 1	8 1	9 1	10 1	11 1	12 1	13 1	14 1	15 1	16 1	17 1	18 1
Prog	19 1	20 1	21 1	22 1	23 1	24 1	25 1	26 1	27 1	28 1	29 1	30 1	31 1	32 1	33 1	34 1	35 1	36 1
Prog	37 1	38 1	39 1	40 1	41 1	42 1	43 1	44 1	45 1	46 1	47 1	48 1	49 1	50 1	51 1	52 1	53 1	

TOD Program Steps

Step 1 Program 1 Step Begins 0600

Flash.
 Red Rest
 Spare 5.
 Spare 3.
 Type 0 Dly Enable. . . .
 Det Diag Plan. . . . 0

Dimming Enable.
 Alt Veh Extension
 Det Log Enable.
 Spare 4
 Spare 2

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
 Red Rest
 Spare 5.
 Spare 3.
 Type 0 Dly Enable. . . .
 Det Diag Plan. . . . 0

Dimming Enable.
 Alt Veh Extension
 Det Log Enable.
 Spare 4
 Spare 2

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

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

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

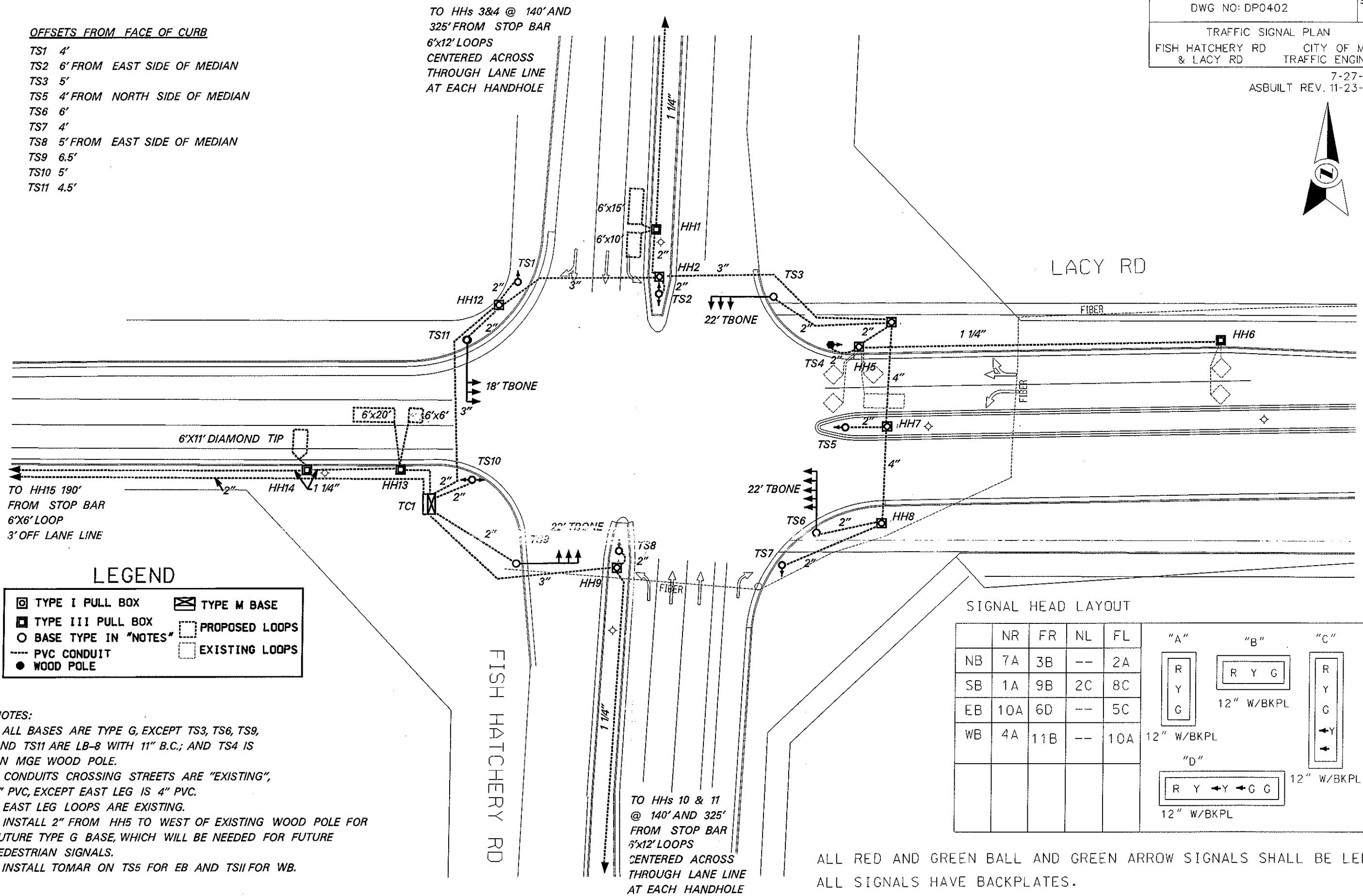
Loop Assignments:

- #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 Right
- #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



- 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



LEGEND

TYPE I PULL BOX	TYPE M BASE
TYPE III PULL BOX	PROPOSED LOOPS
BASE TYPE IN "NOTES"	EXISTING LOOPS
PVC CONDUIT	
WOOD POLE	

- NOTES:
- 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.
 - CONDUITS CROSSING STREETS ARE "EXISTING", 3" PVC, EXCEPT EAST LEG IS 4" PVC.
 - EAST LEG LOOPS ARE EXISTING.
 - INSTALL 2" FROM HH5 TO WEST OF EXISTING WOOD POLE FOR FUTURE TYPE G BASE, WHICH WILL BE NEEDED FOR FUTURE PEDESTRIAN SIGNALS.
 - INSTALL TOMAR ON TS5 FOR EB AND TS11 FOR WB.

SIGNAL HEAD LAYOUT

	NR	FR	NL	FL	"A"	"B"	"C"
NB	7A	3B	--	2A			
SB	1A	9B	2C	8C			
EB	10A	6D	--	5C			
WB	4A	11B	--	10A			

ALL RED AND GREEN BALL AND GREEN ARROW SIGNALS SHALL BE LED.
ALL SIGNALS HAVE BACKPLATES.

ORIGINATOR: CITY OF MADISON, STREETS ENGINEERING

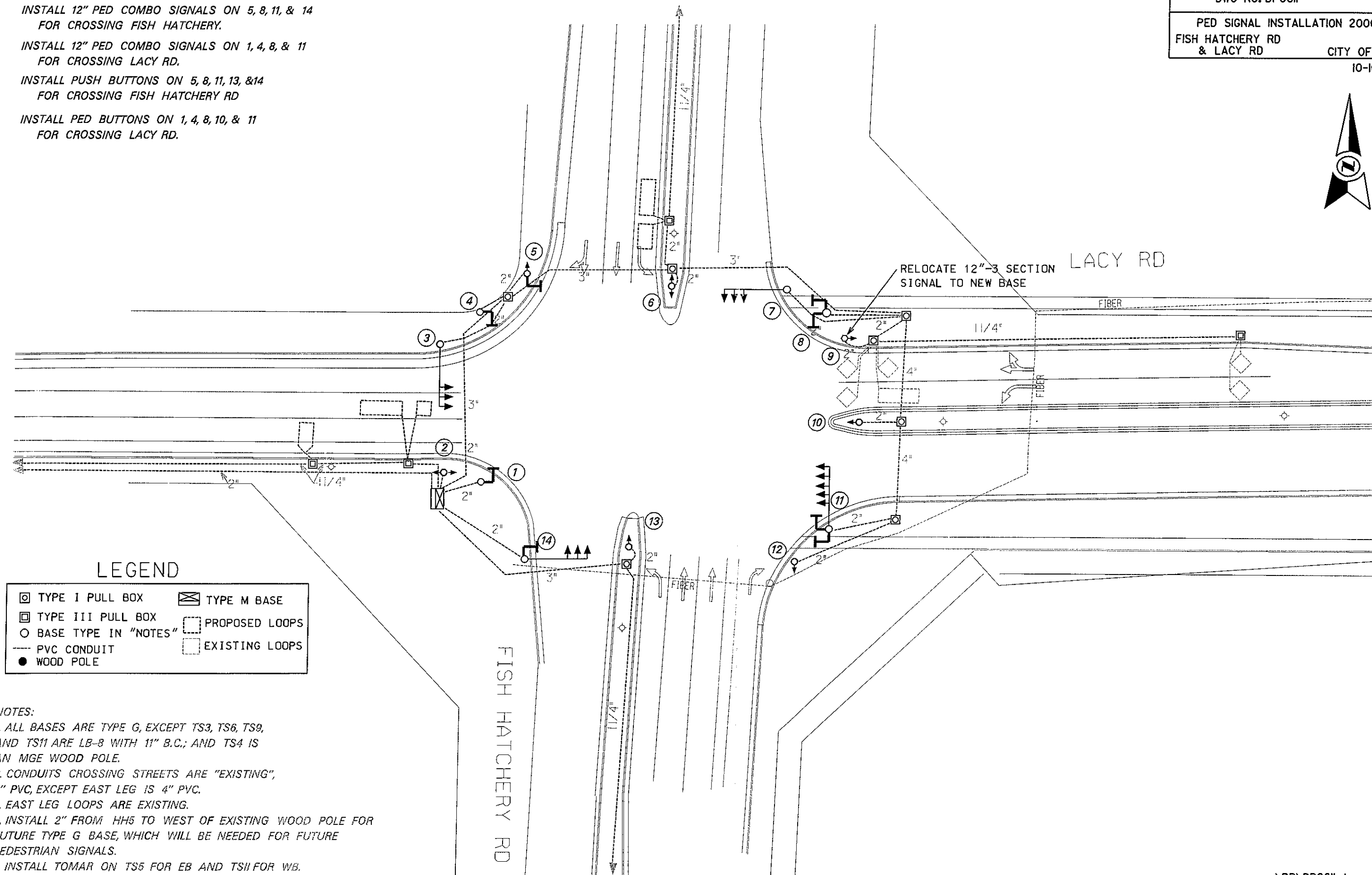


INSTALL 12" PED COMBO SIGNALS ON 5, 8, 11, & 14
 FOR CROSSING FISH HATCHERY.

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.



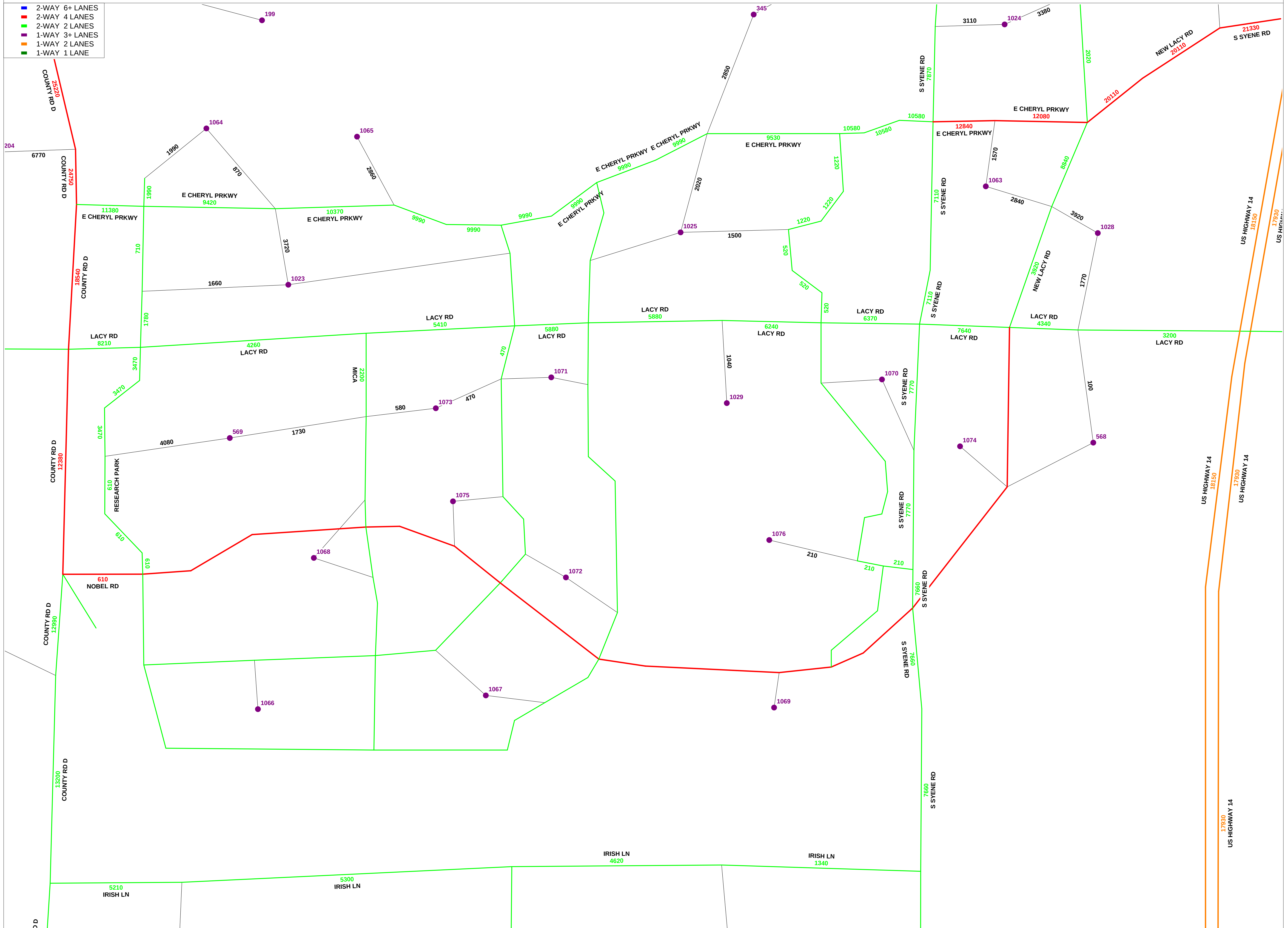
By-Phase Timing Data

Direction	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
	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

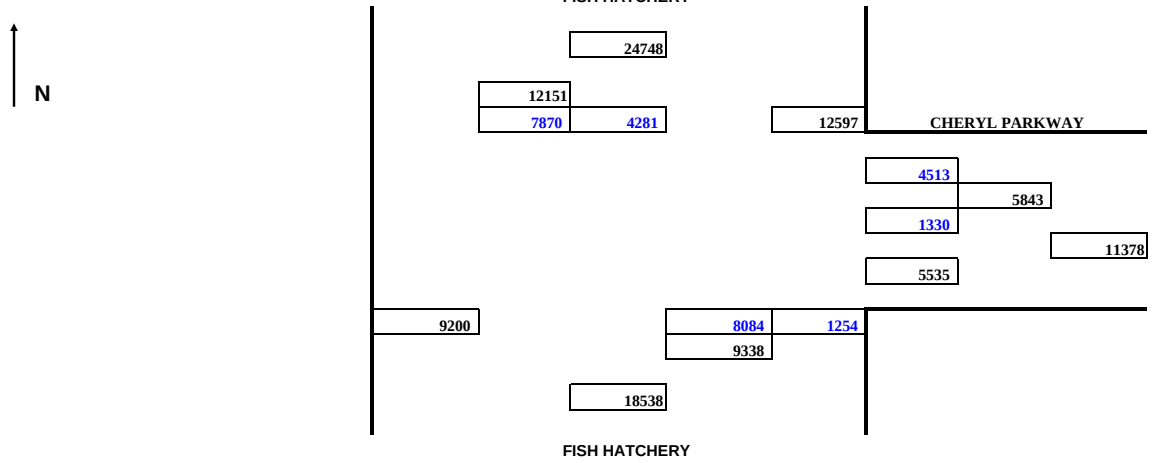
APPENDIX A

MPO Year 2025 Background Traffic ADT Forecasts

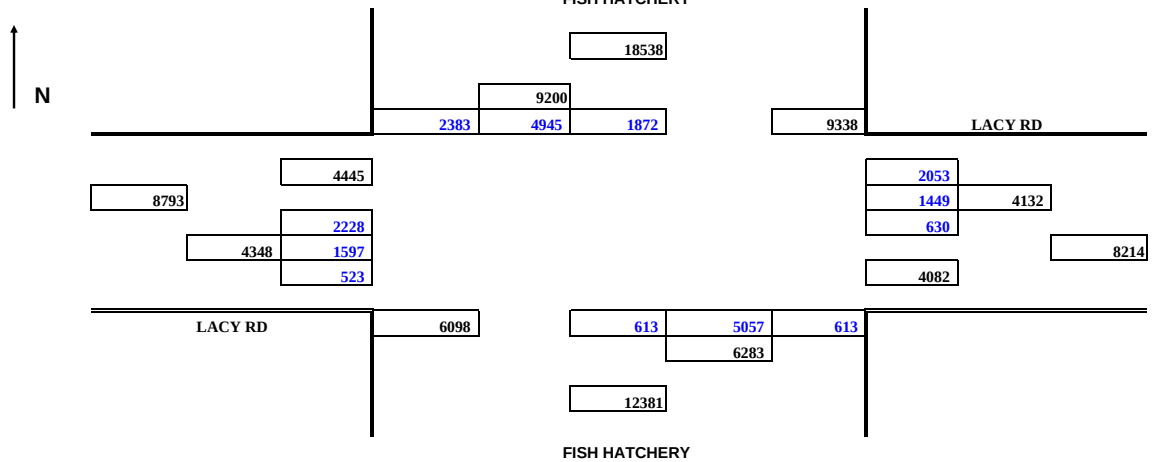
DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT A: 2025 BACKGROUND AADT VOLUMES REVISED 12/18/08
12/18/08



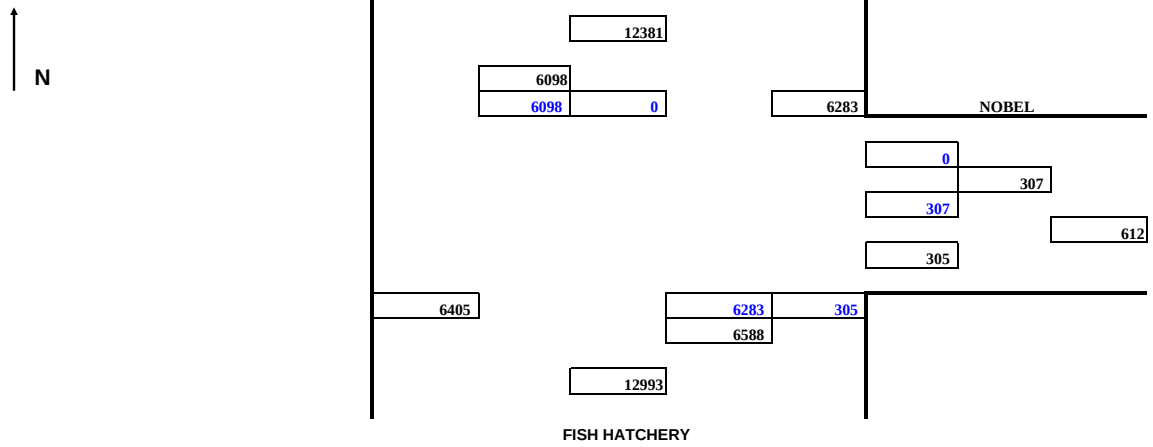
ALT A: 2025 BACKGROUND
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



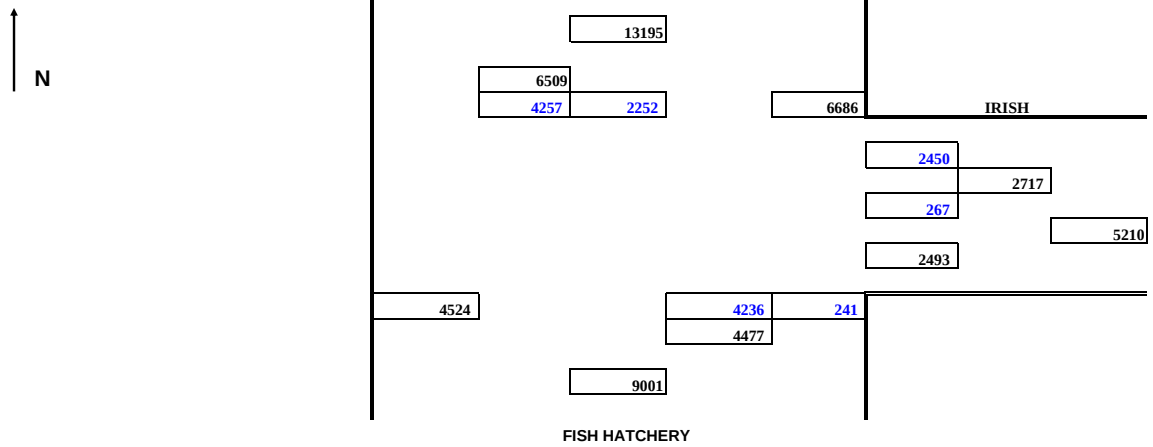
ALT A: 2025 BACKGROUND
LOCATION 2: FISH HATCHERY - LACY



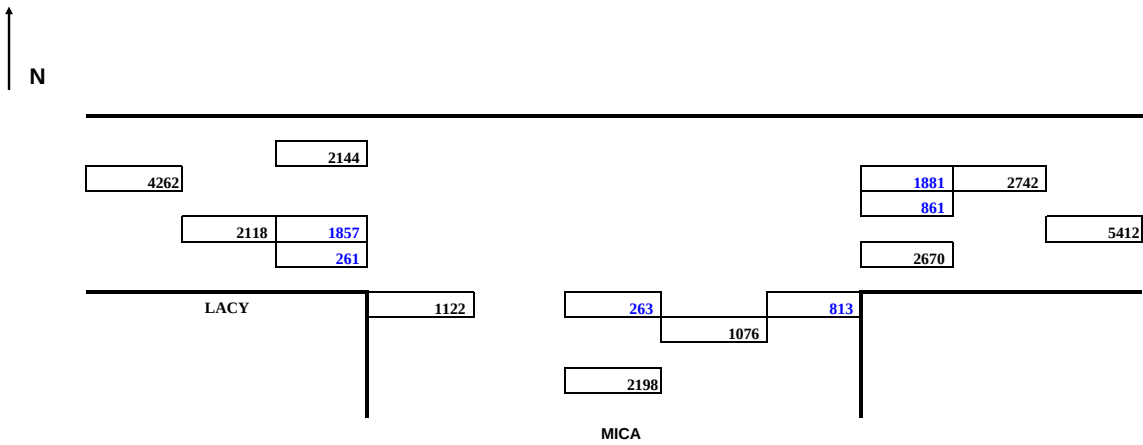
ALT A: 2025 BACKGROUND
LOCATION 3: FISH HATCHERY - NOBEL



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

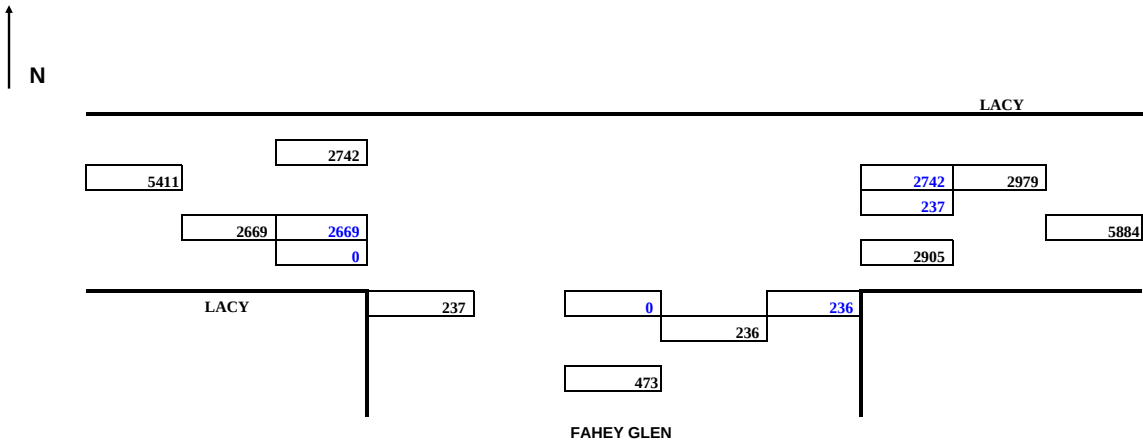
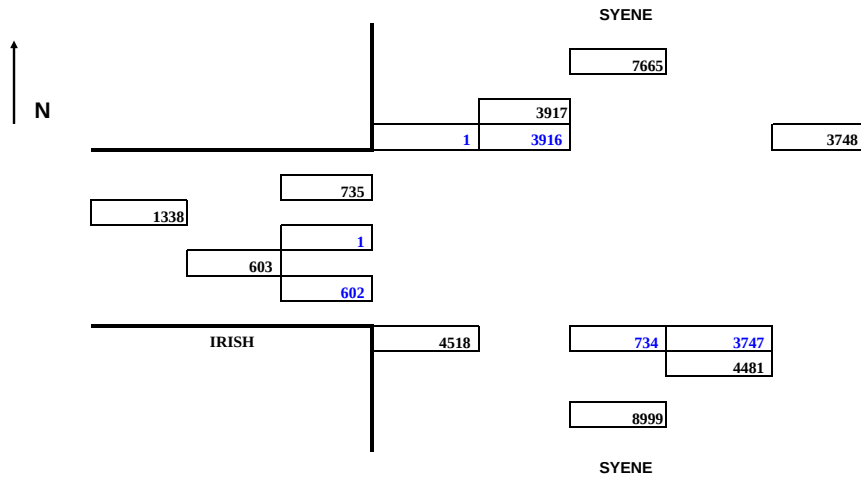


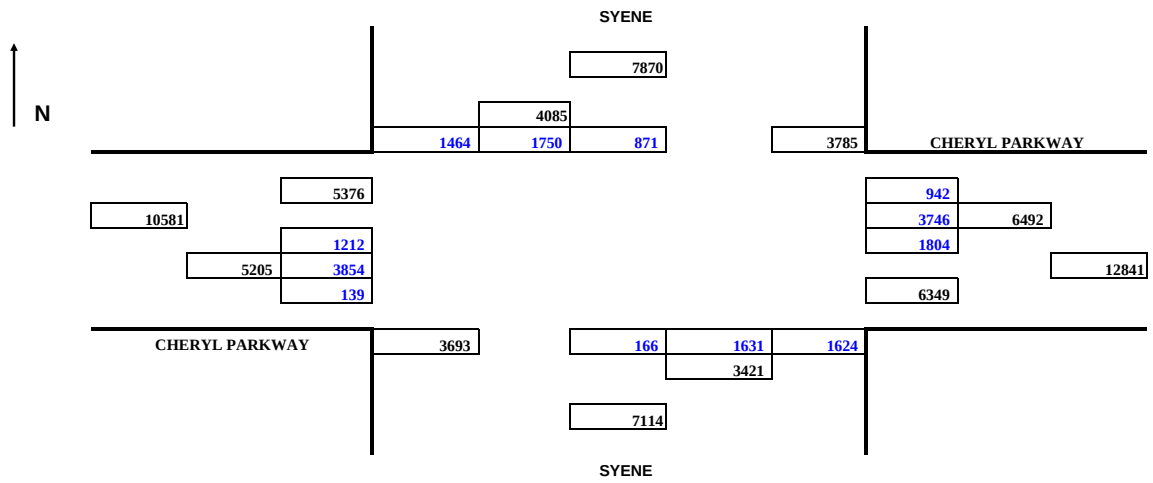
Figure 1: Schematic representation of the LACY and SYENE systems. The diagram shows two systems, LACY and SYENE, with their respective components and connections. A north arrow is present in the top left. The LACY system includes components 6370, 3197, 3173, 971, 2044, 158, 3421, 314, 2034, 1432, 3780, 3857, and 7637. The SYENE system includes components 7114, 3693, 1008, 2382, 303, 155, 2136, 3801, 1510, and 7773. The systems are connected by a central horizontal line.

Figure 1: Schematic representation of the LACY and NOBEL datasets. The figure shows two sets of buildings represented by rectangles with numbers inside. The NOBEL dataset is on the left, and the LACY dataset is on the right. A north arrow points upwards. Buildings are connected by lines, indicating relationships or paths. The NOBEL dataset includes buildings with numbers 7636, 3779, 1845, 3857, 2012, 1763, 1915, 152, 3922, and 2007. The LACY dataset includes buildings with numbers 162, 2016, 2178, 2164, and 4342. The LACY dataset is labeled 'LACY' and the NOBEL dataset is labeled 'NOBEL'.

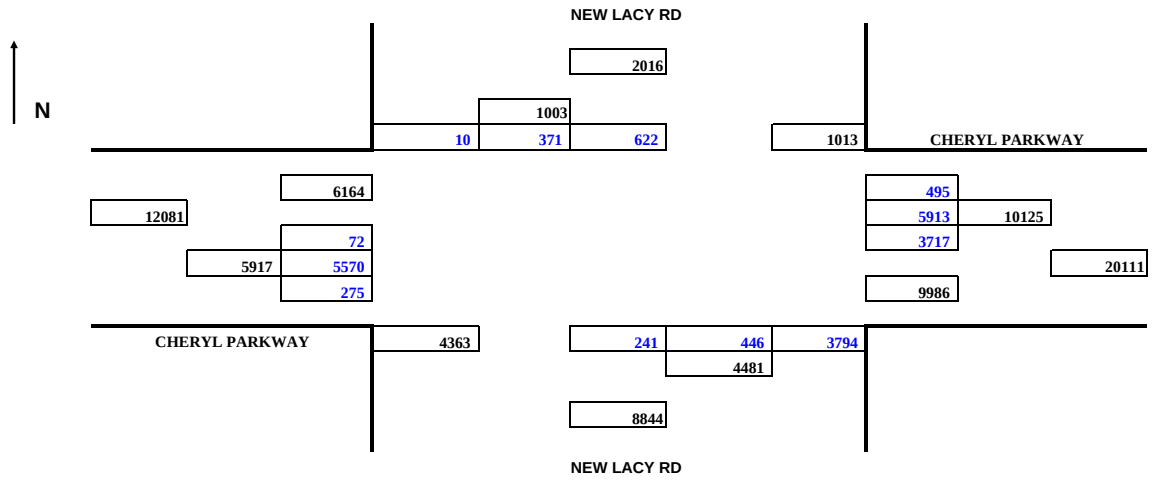
ALT A: 2025 BACKGROUND
LOCATION 14: IRISH - SYENE



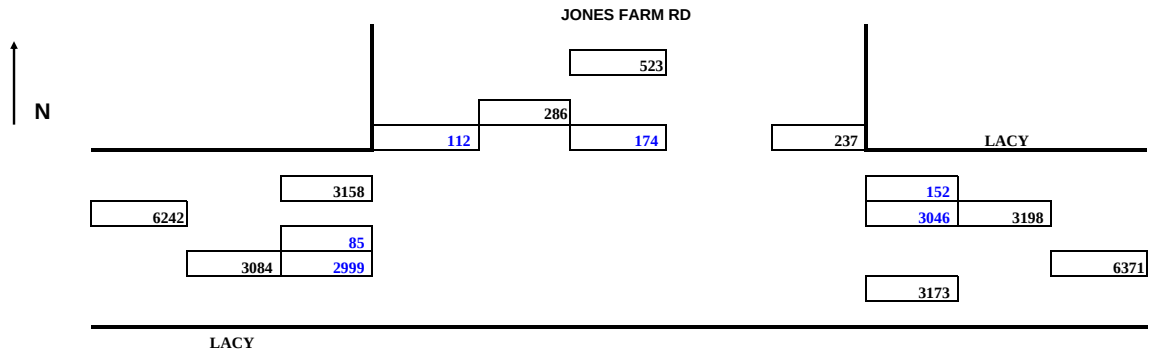
ALT A: 2025 BACKGROUND
LOCATION 15: CHERYL PARKWAY - SYENE



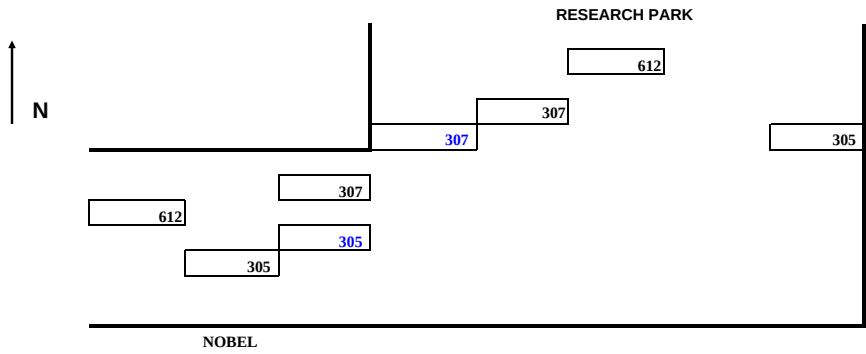
ALT A: 2025 BACKGROUND
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



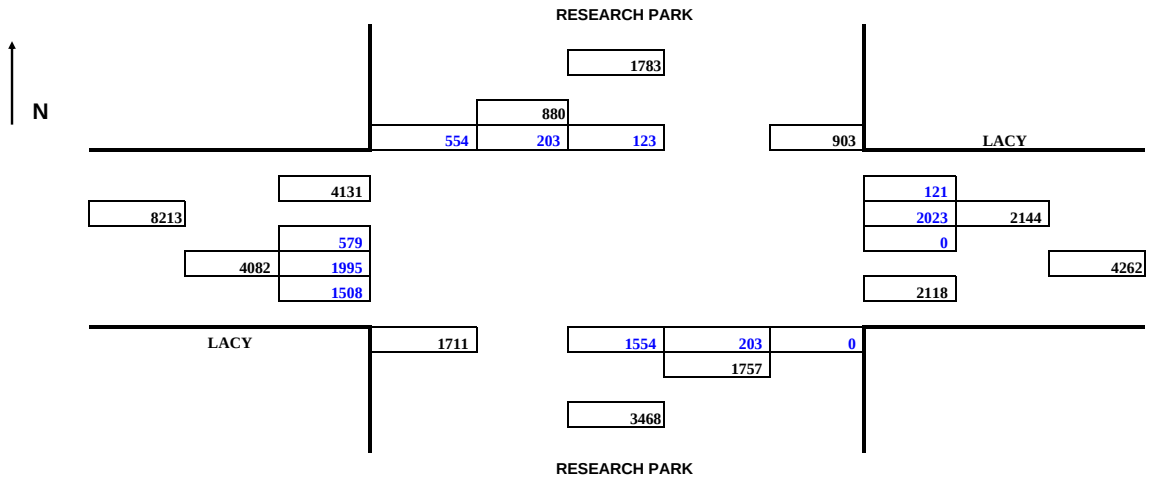
ALT A: 2025 BACKGROUND
LOCATION 17: LACY - JONES FARM RD



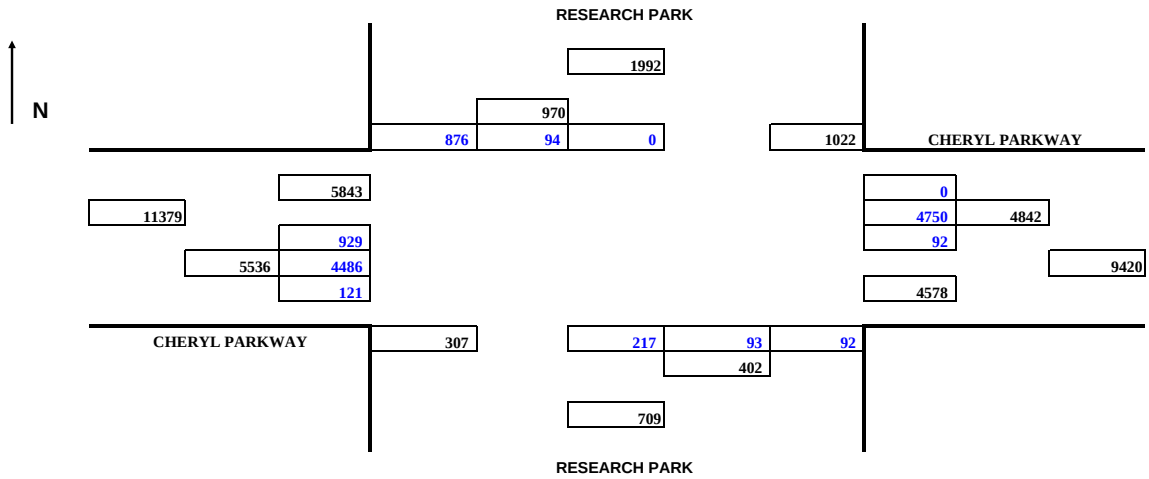
ALT A: 2025 BACKGROUND
LOCATION 19: NOBEL - RESEARCH PARK



ALT A: 2025 BACKGROUND
LOCATION 20: LACY - RESEARCH PARK

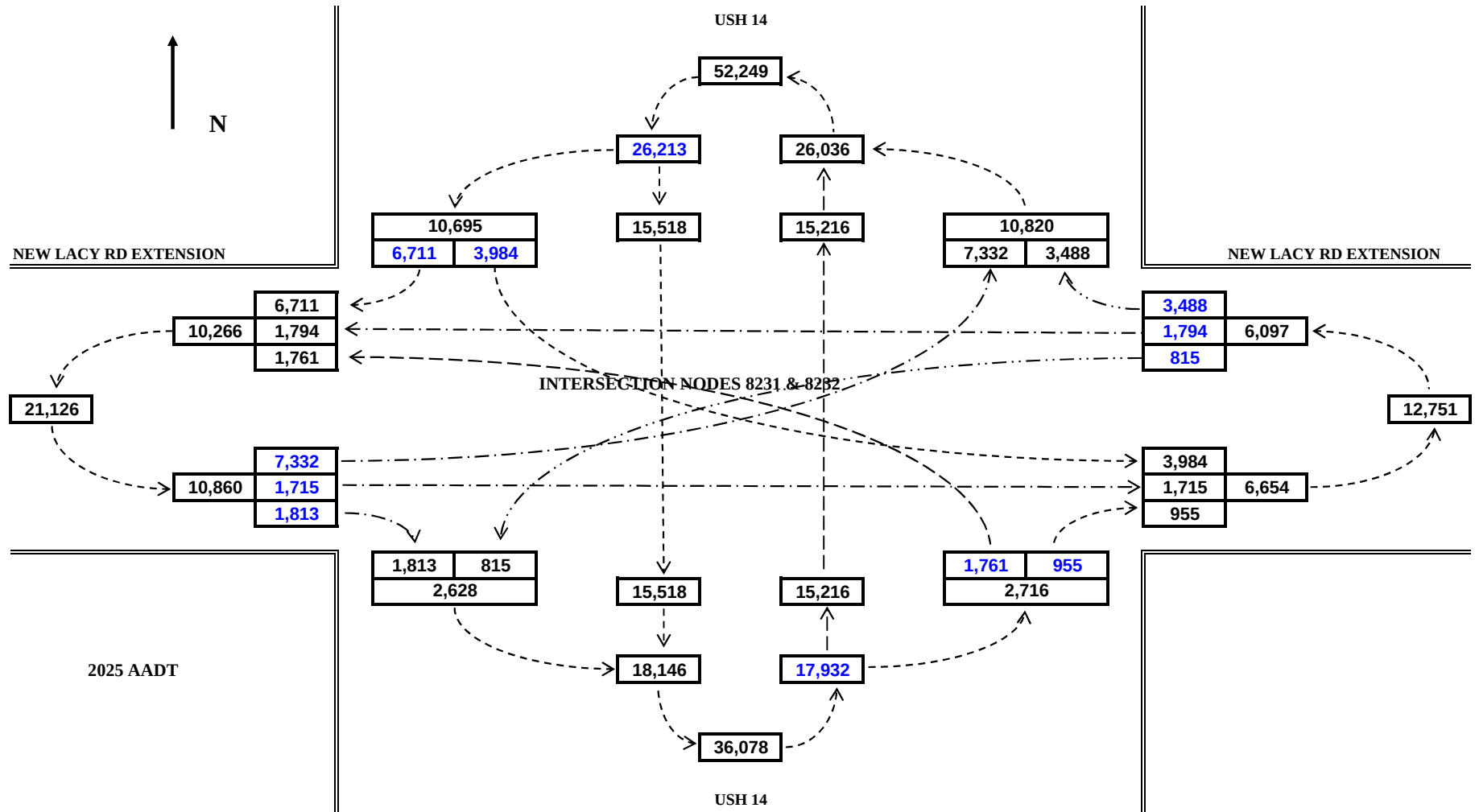


ALT A: 2025 BACKGROUND
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT A: 2025 BACKGROUND

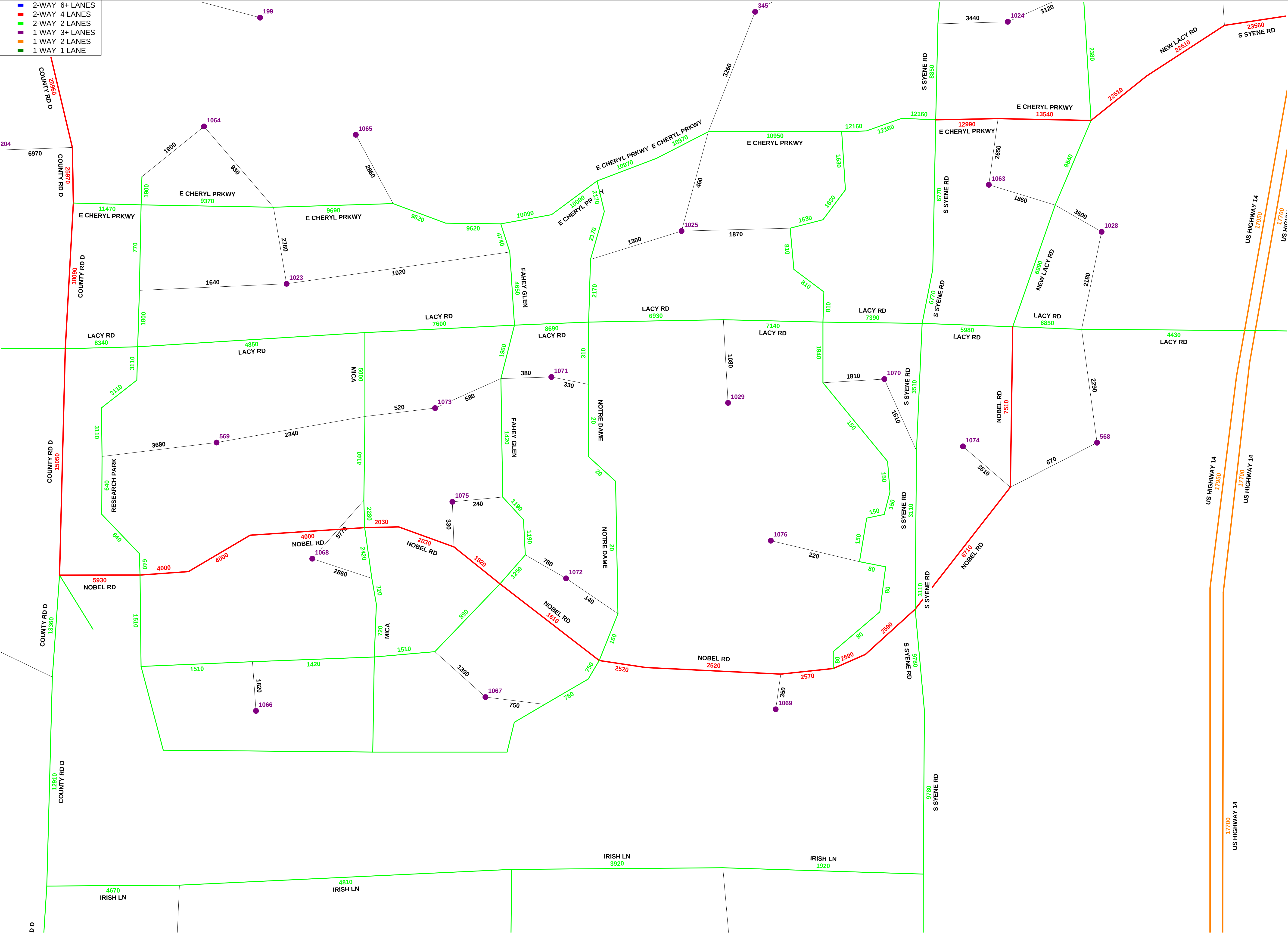
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



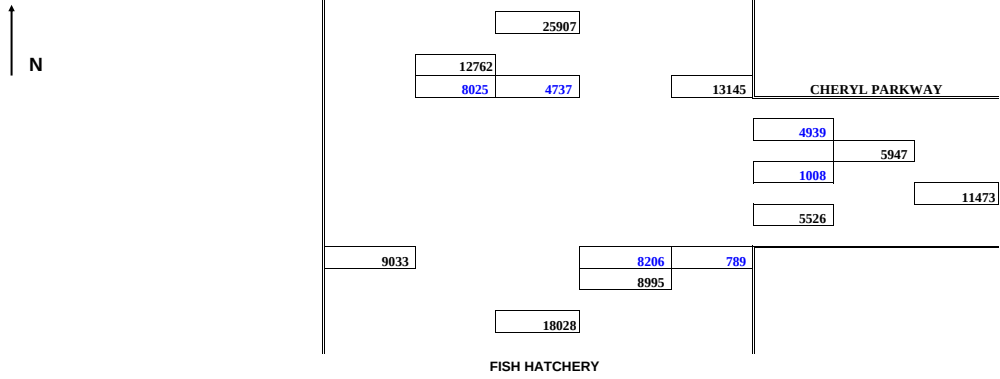
APPENDIX A

MPO Year 2035 Background Traffic ADT Forecasts

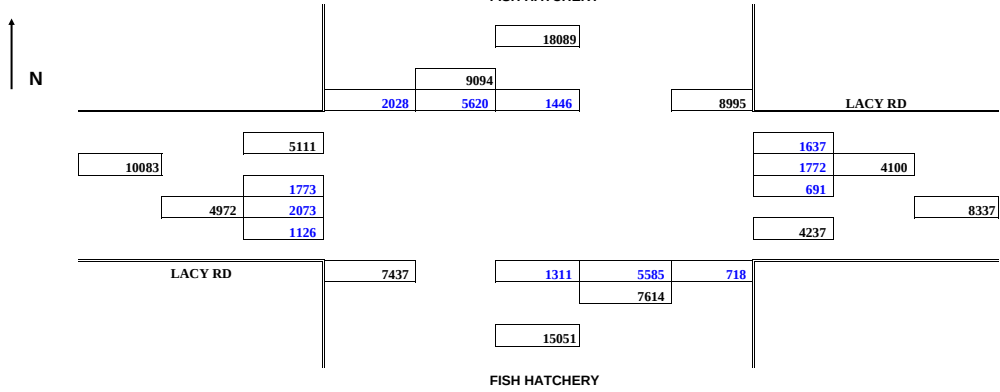
DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCBURG)
ALT B: 2025 BUILD AADT VOLUMES
12/18/08



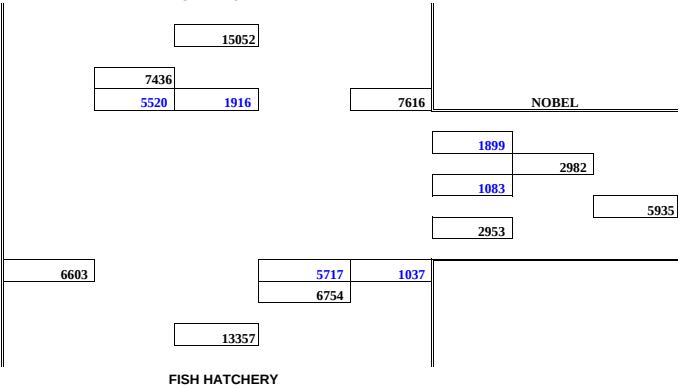
ALT B: 2025 BUILD
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY
FISH HATCHERY



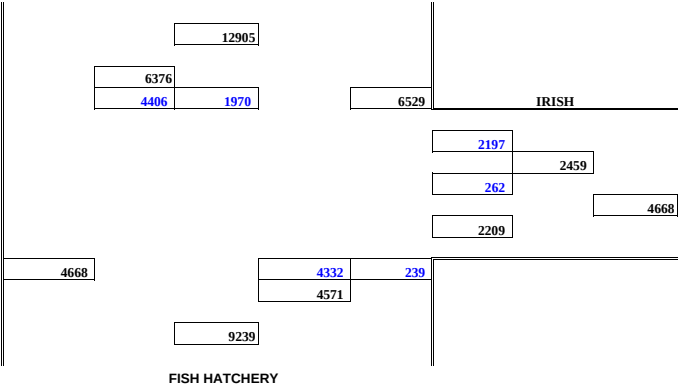
ALT B: 2025 BUILD
LOCATION 2: FISH HATCHERY - LACY
FISH HATCHERY



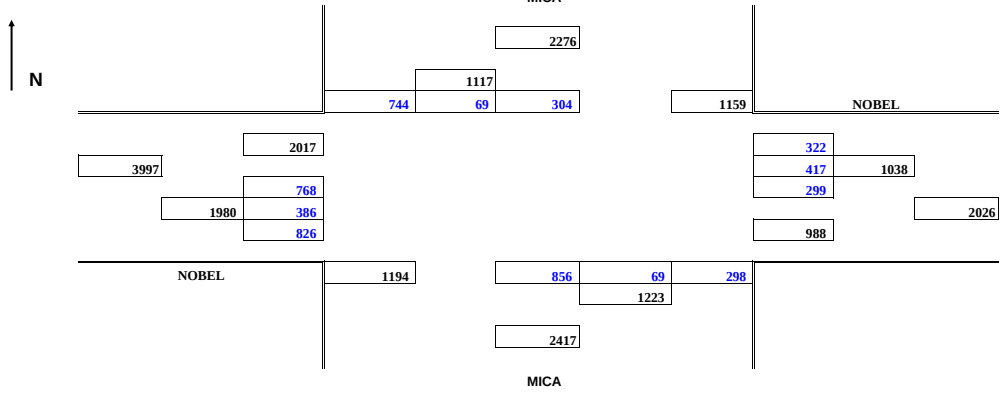
ALT B: 2025 BUILD
LOCATION 3: FISH HATCHERY - NOBEL



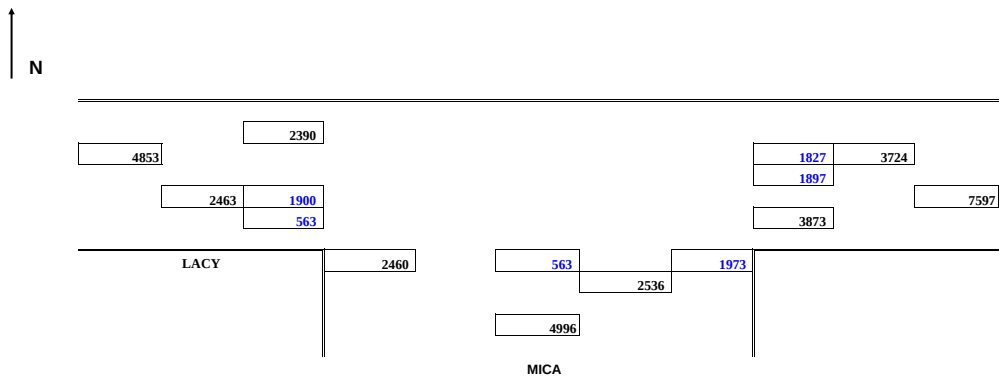
ALT B: 2025 BUILD
LOCATION 4: FISH HATCHERY - IRISH



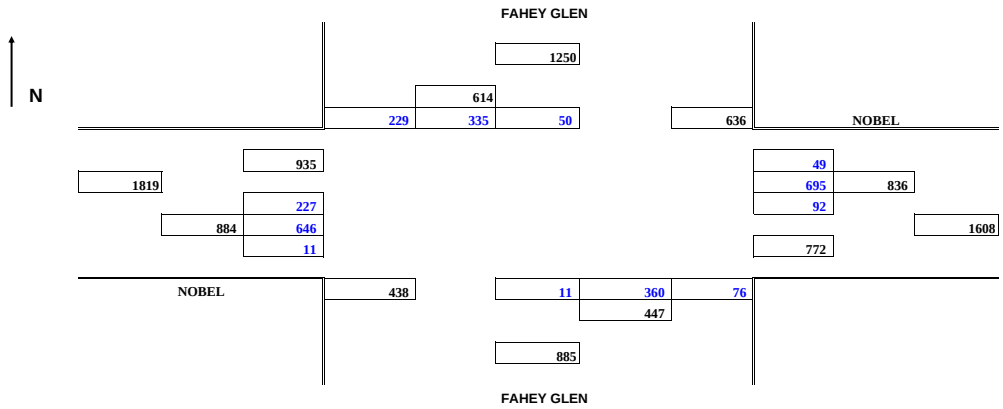
ALT B: 2025 BUILD
LOCATION 5: NOBEL - MICA



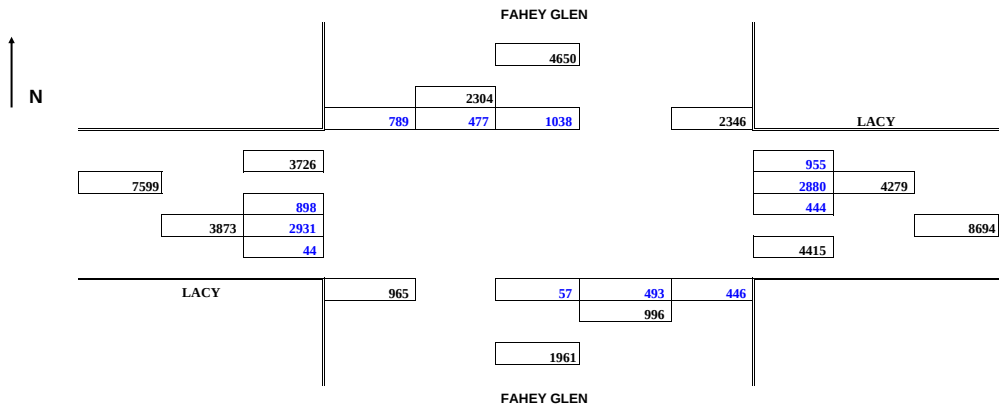
ALT B: 2025 BUILD
LOCATION 6: LACY - MICA



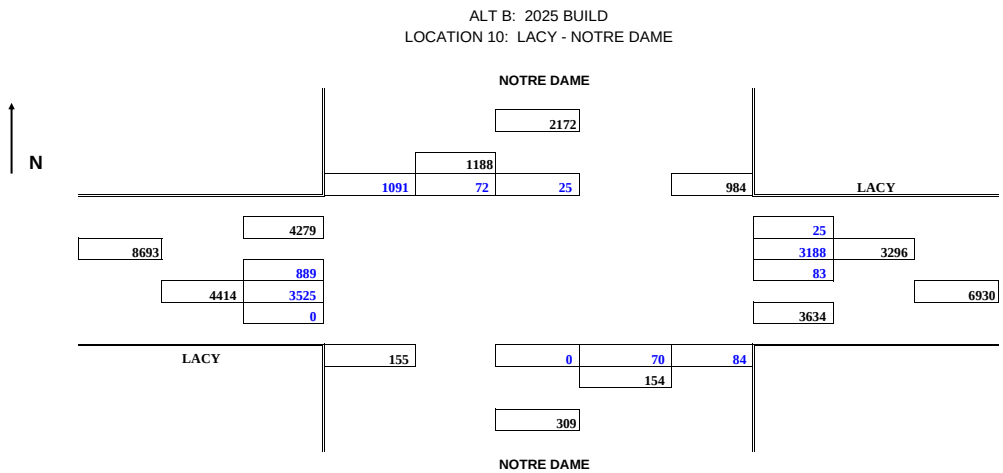
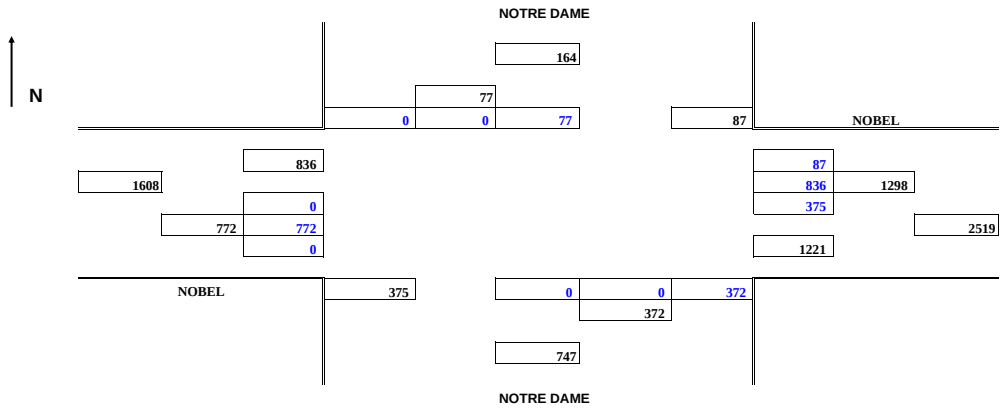
ALT B: 2025 BUILD
LOCATION 7: NOBEL - FAHEY GLEN



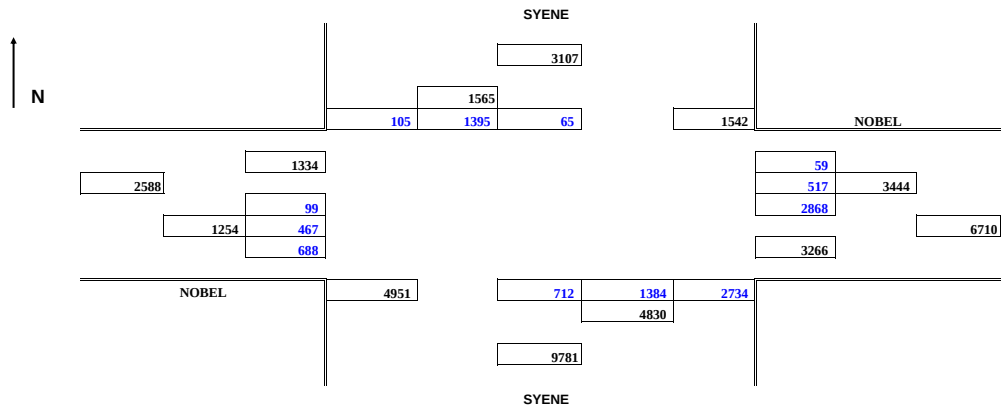
ALT B: 2025 BUILD
LOCATION 8: LACY - FAHEY GLEN



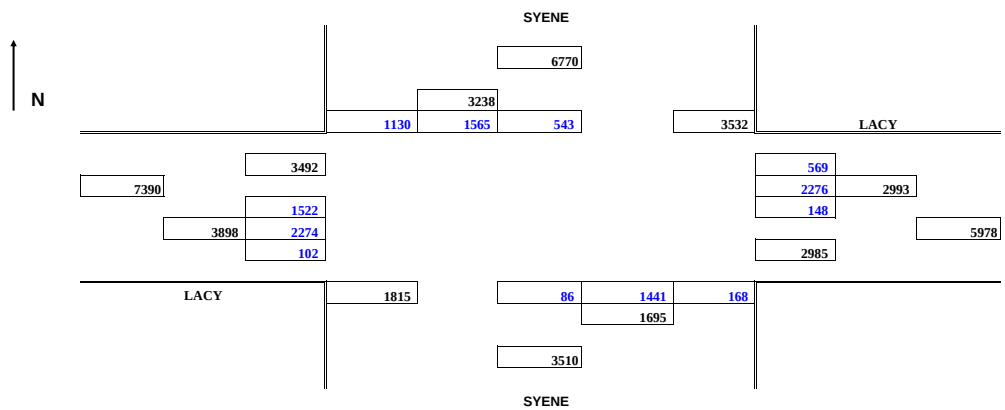
ALT A: 2025 BACKGROUND
LOCATION 9: NOBEL - NOTRE DAME



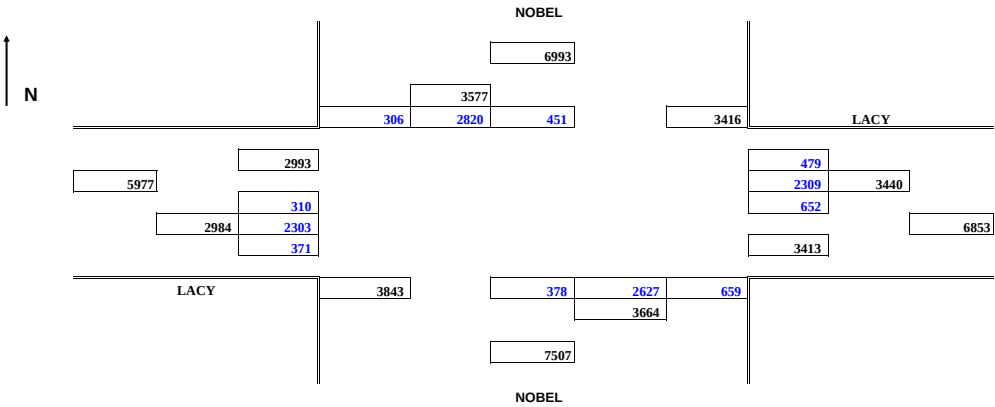
ALT B: 2025 BUILD
LOCATION 11: NOBEL - SYENE



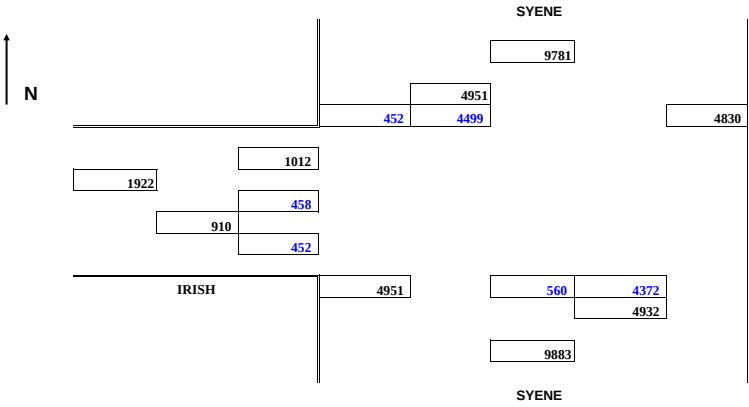
ALT B: 2025 BUILD
LOCATION 12: LACY - SYENE



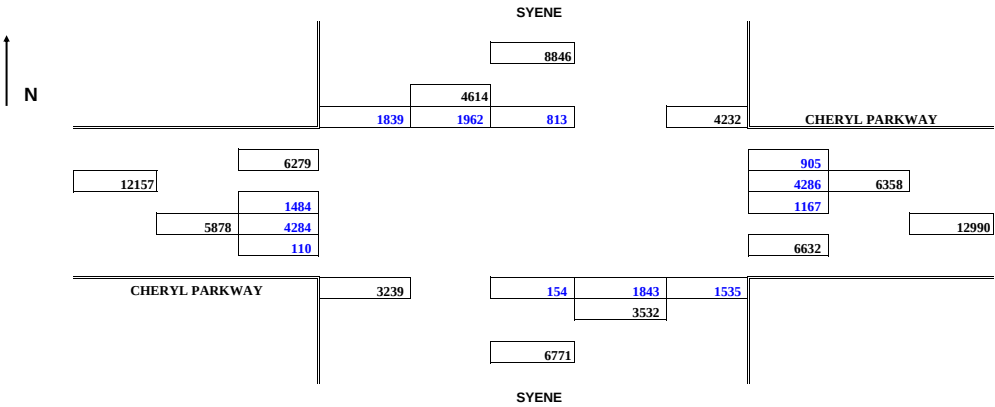
ALT B: 2025 BUILD
LOCATION 13: NOBEL - LACY



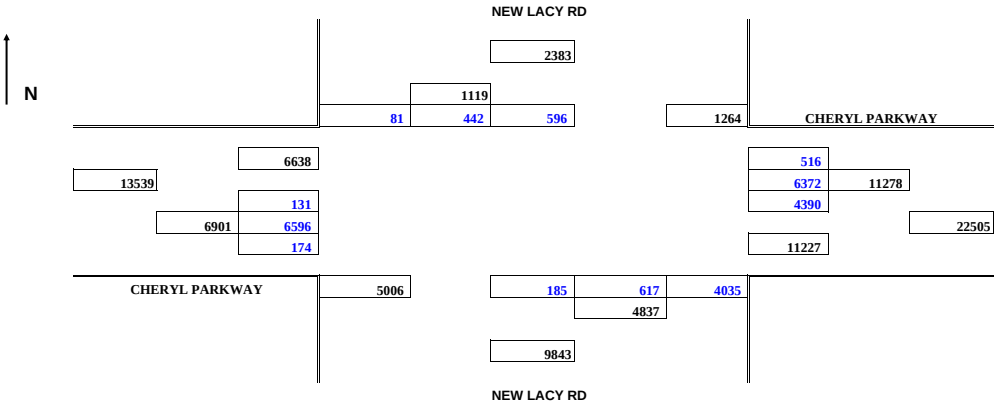
ALT B: 2025 BUILD
LOCATION 14: IRISH - SYENE



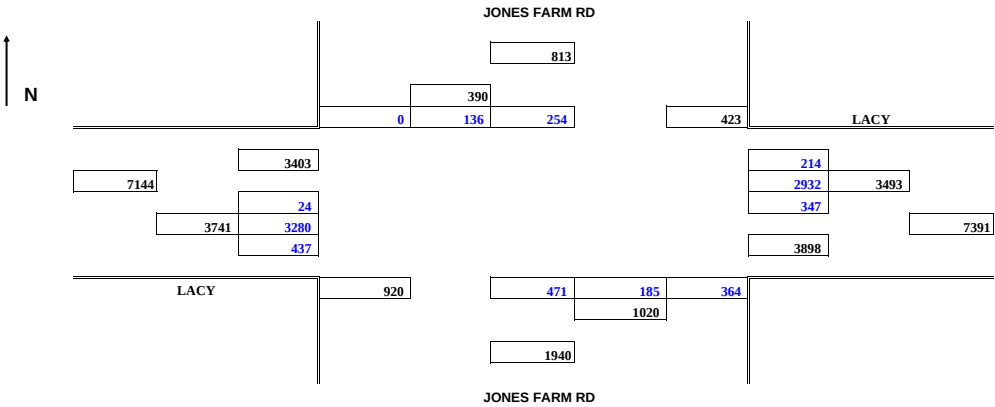
ALT B: 2025 BUILD
LOCATION 15: CHERYL PARKWAY - SYENE



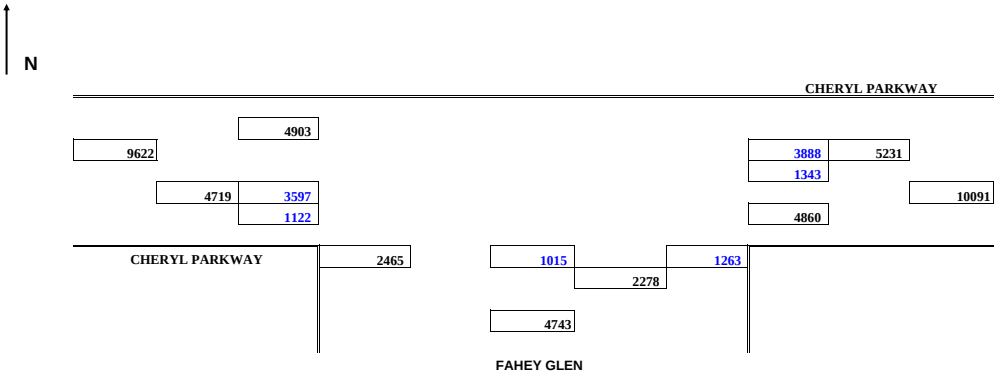
ALT B: 2025 BUILD
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



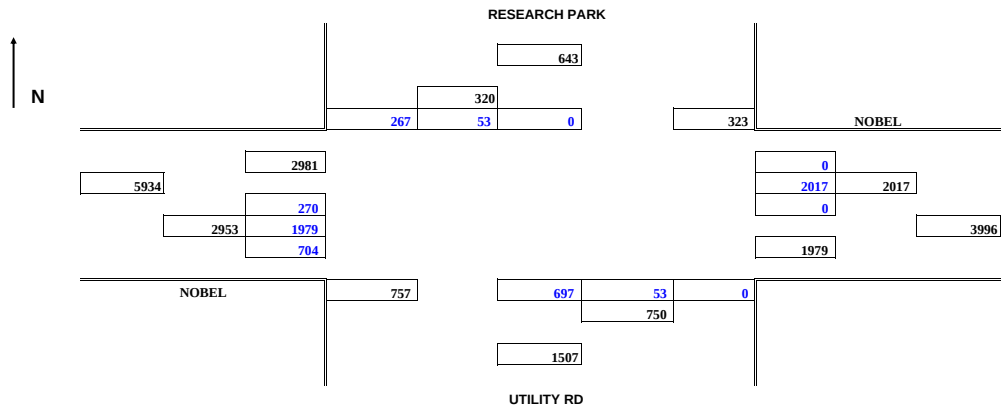
ALT B: 2025 BUILD
LOCATION 17: LACY - JONES FARM RD



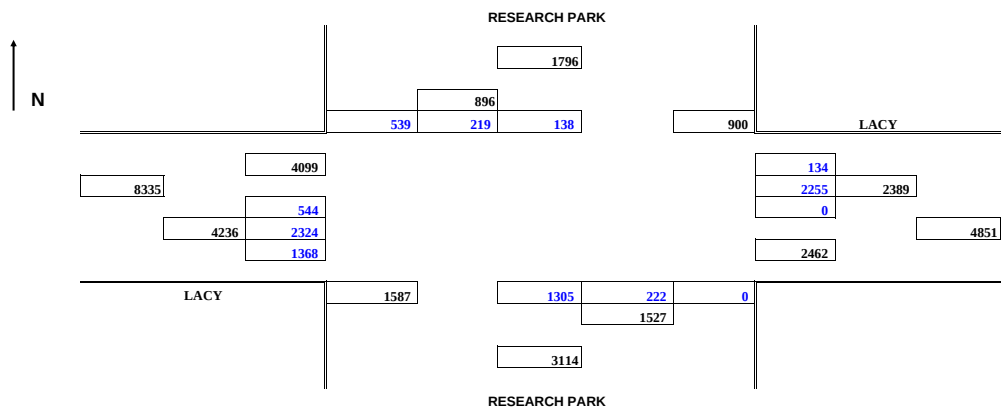
ALT B: 2025 BUILD
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



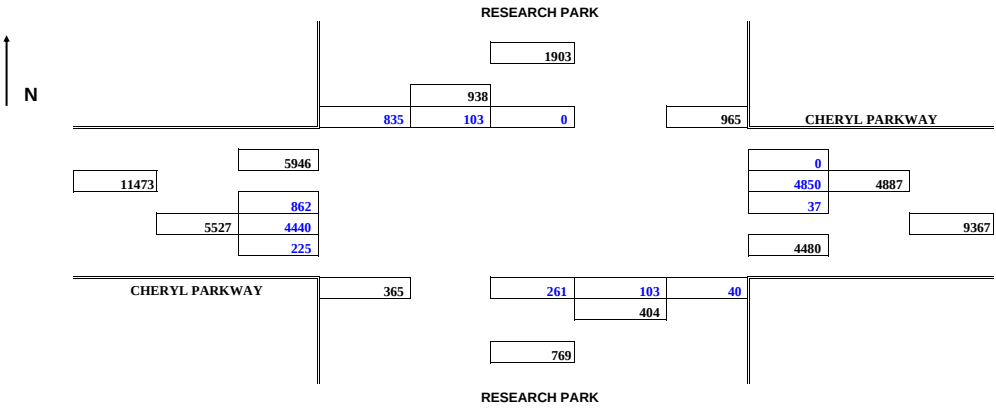
ALT B: 2025 BUILD
LOCATION 19: NOBEL - RESEARCH PARK



ALT B: 2025 BUILD
LOCATION 20: LACY - RESEARCH PARK

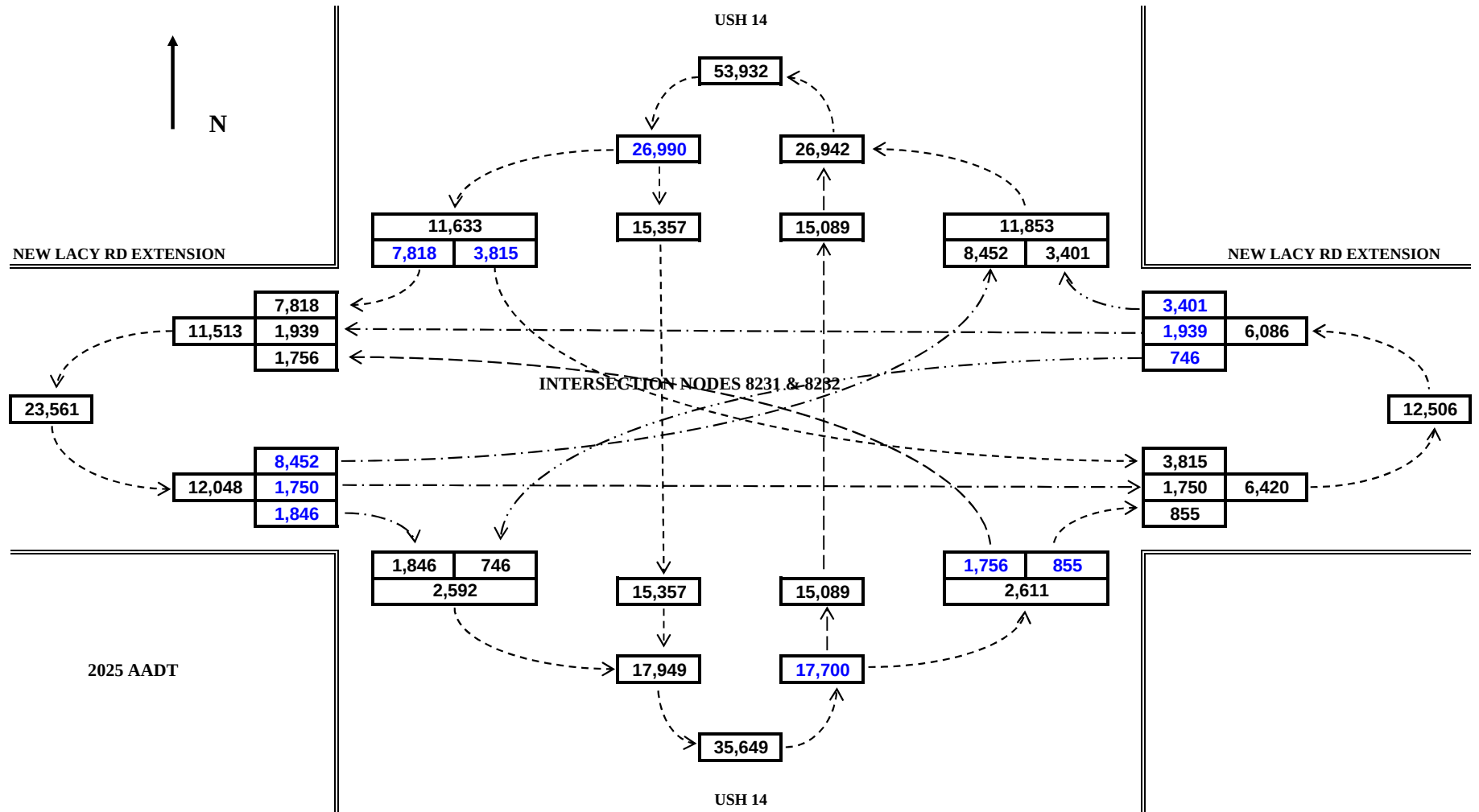


ALT B: 2025 BUILD
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT B: 2025 BUILD

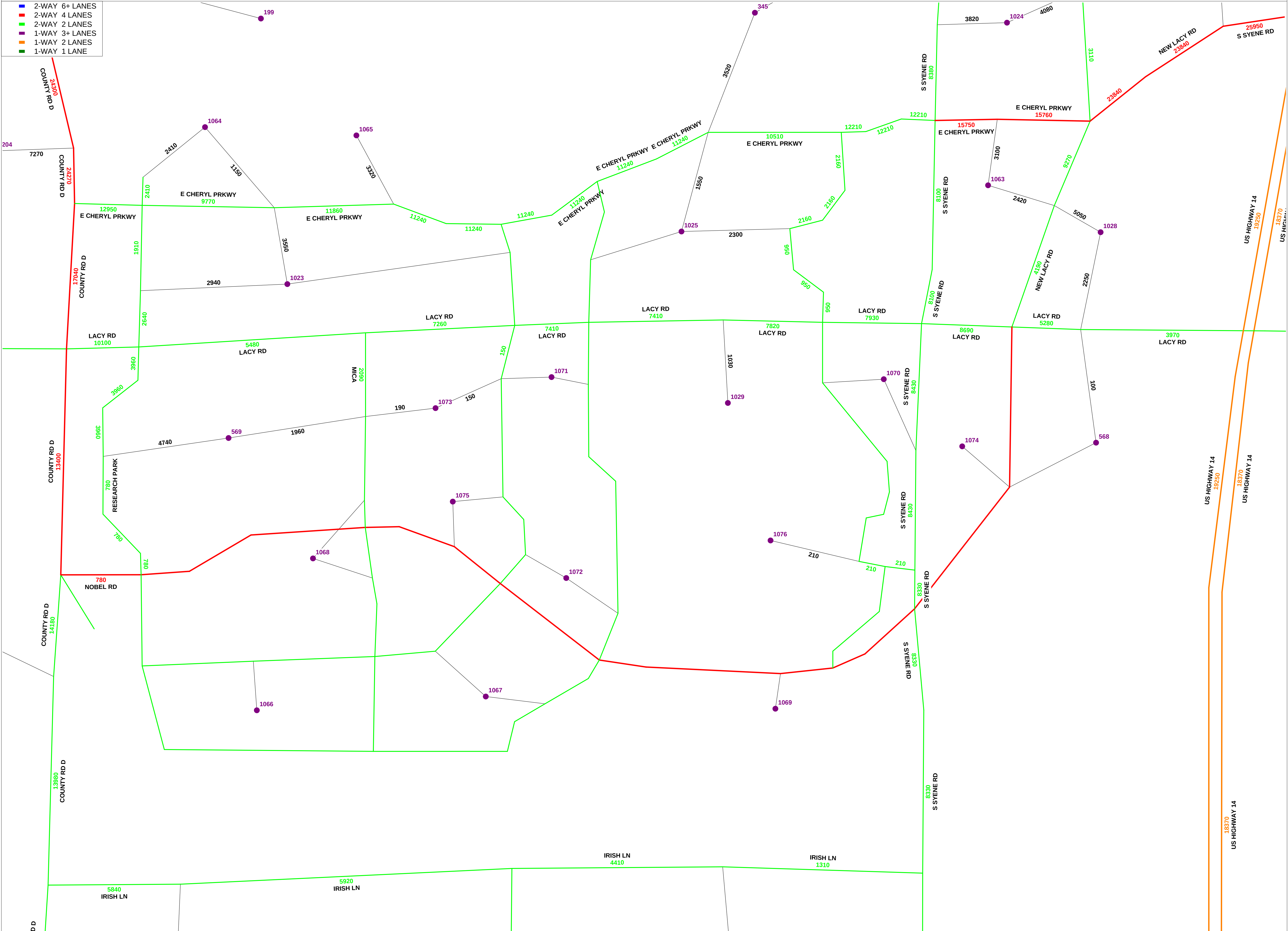
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



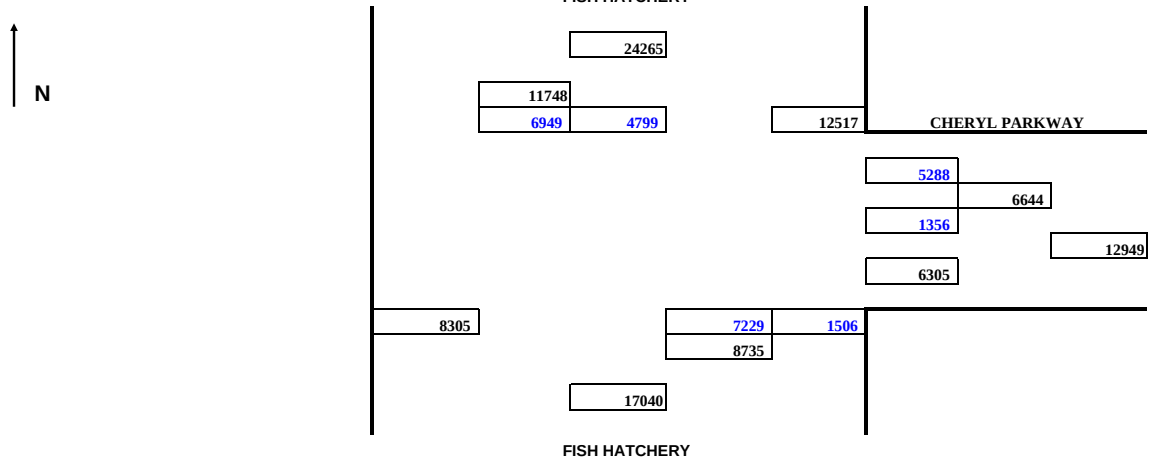
APPENDIX A

MPO Year 2025 Build Traffic ADT Forecasts

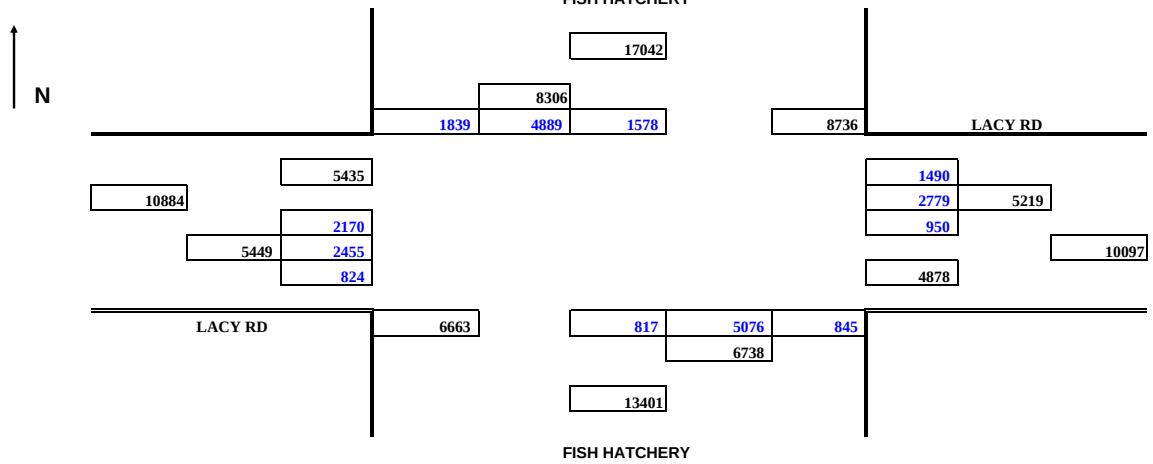
DANE COUNTY 2004 FUNCTIONAL CLASS NETWORK TP+ MODEL - CS VERSION 4
2008 MCGAW NEIGHBORHOOD DEVELOPMENT PLAN (FITCHBURG)
ALT C: 2035 BACKGROUND AADT VOLUMES REVISED 12/18/08
12/18/08



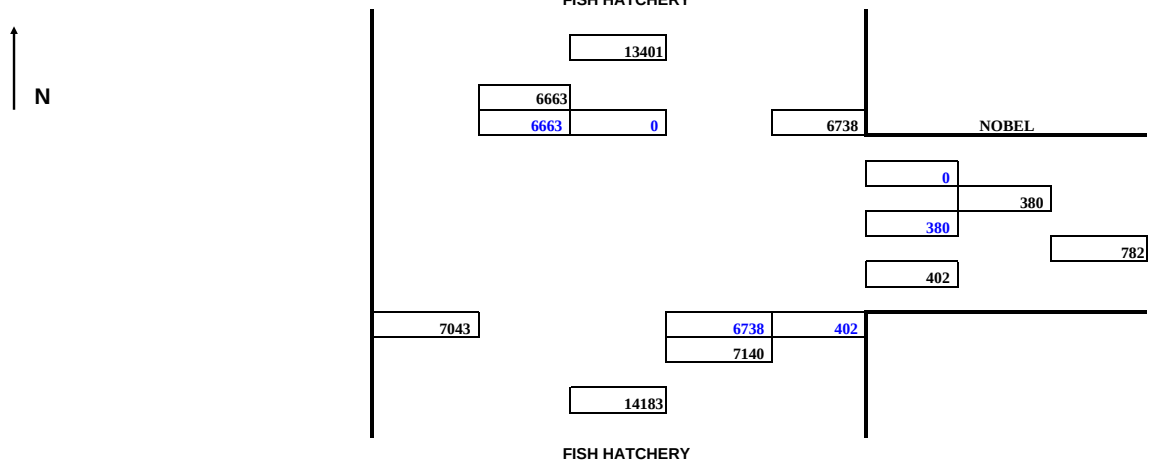
ALT C: 2035 BACKGROUND
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



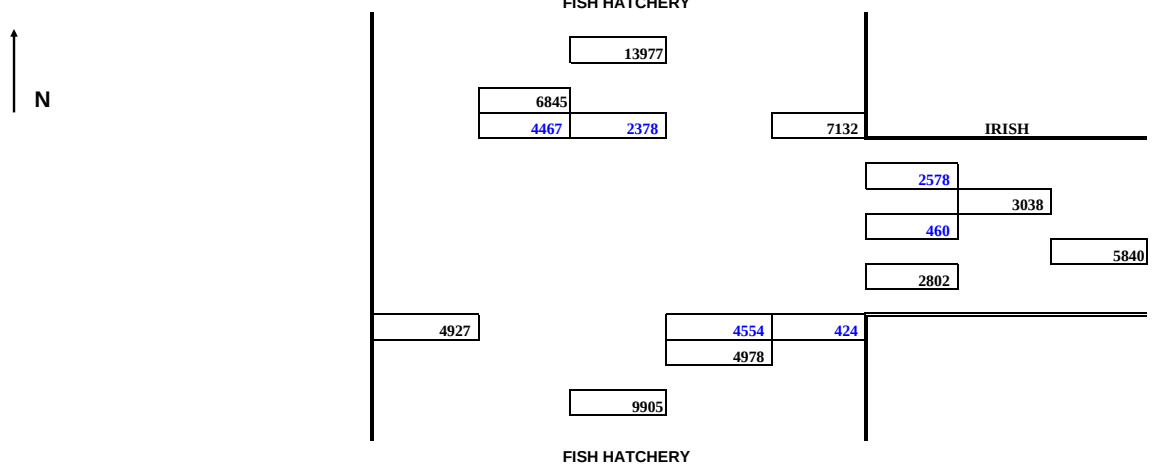
ALT C: 2035 BACKGROUND
LOCATION 2: FISH HATCHERY - LACY



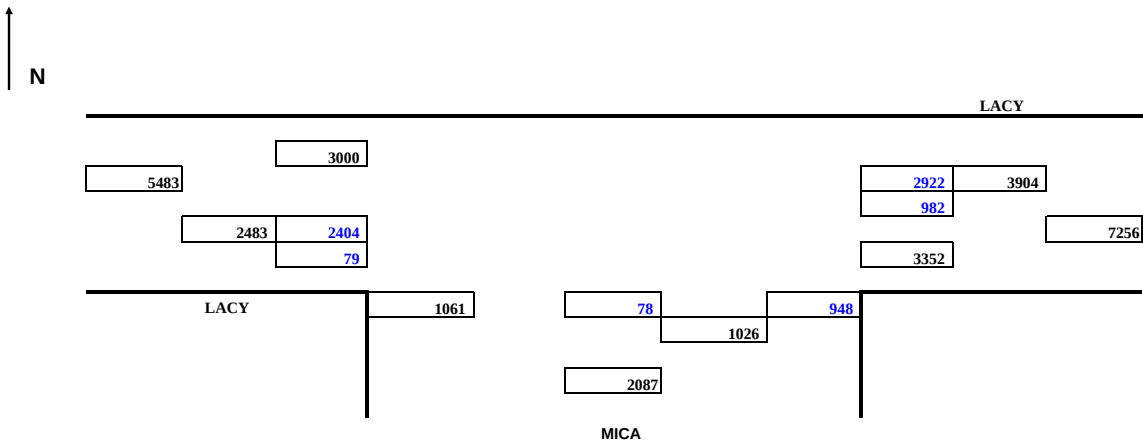
ALT C: 2035 BACKGROUND
LOCATION 3: FISH HATCHERY - NOBEL



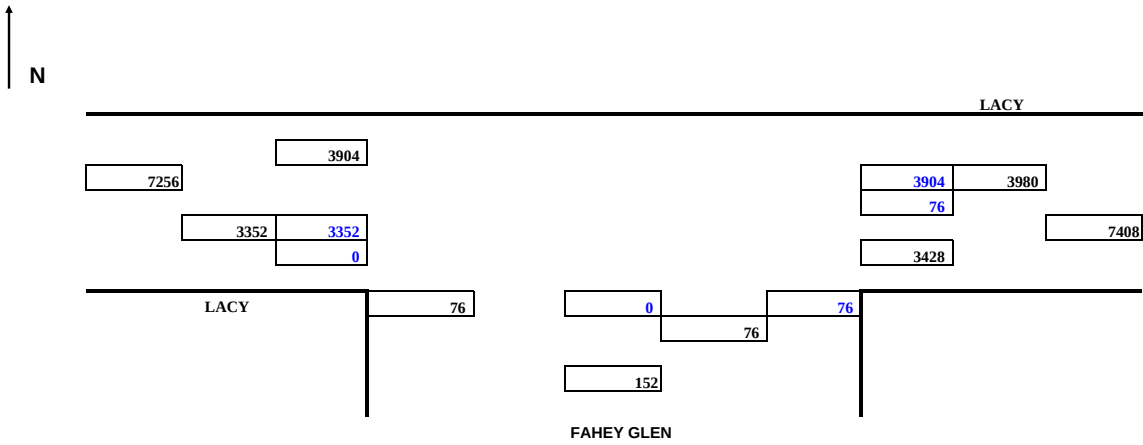
ALT C: 2035 BACKGROUND
LOCATION 4: FISH HATCHERY - IRISH



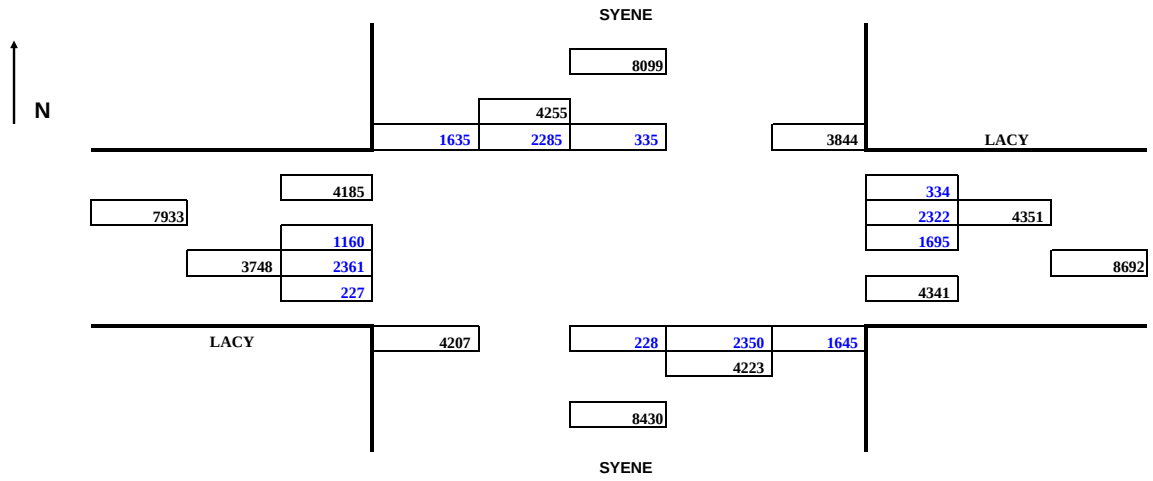
ALT C: 2035 BACKGROUND
LOCATION 6: LACY - MICA



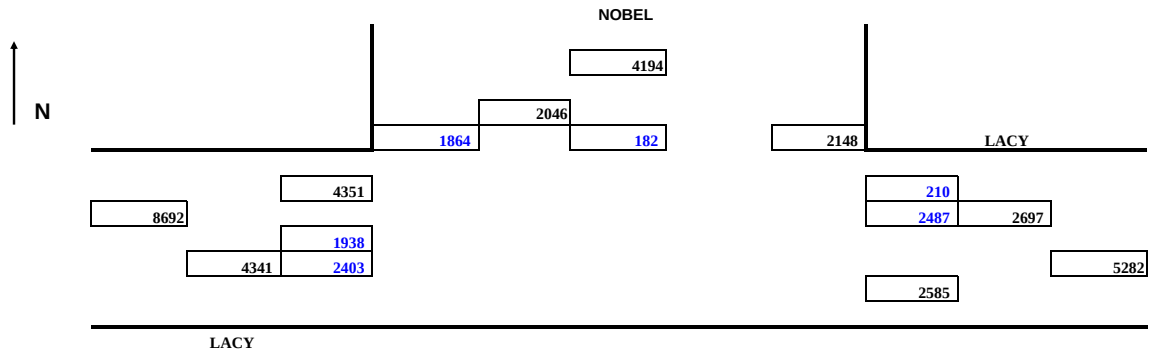
ALT C: 2035 BACKGROUND
LOCATION 8: LACY - FAHEY GLEN



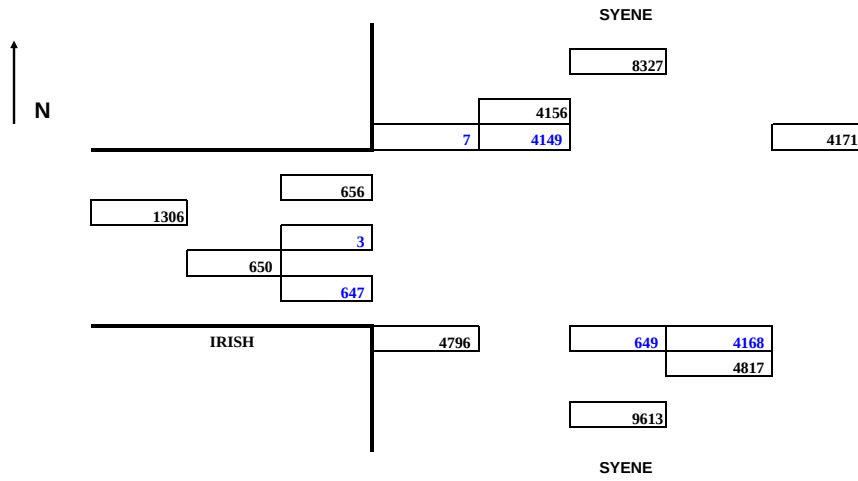
ALT C: 2035 BACKGROUND
LOCATION 12: LACY - SYENE



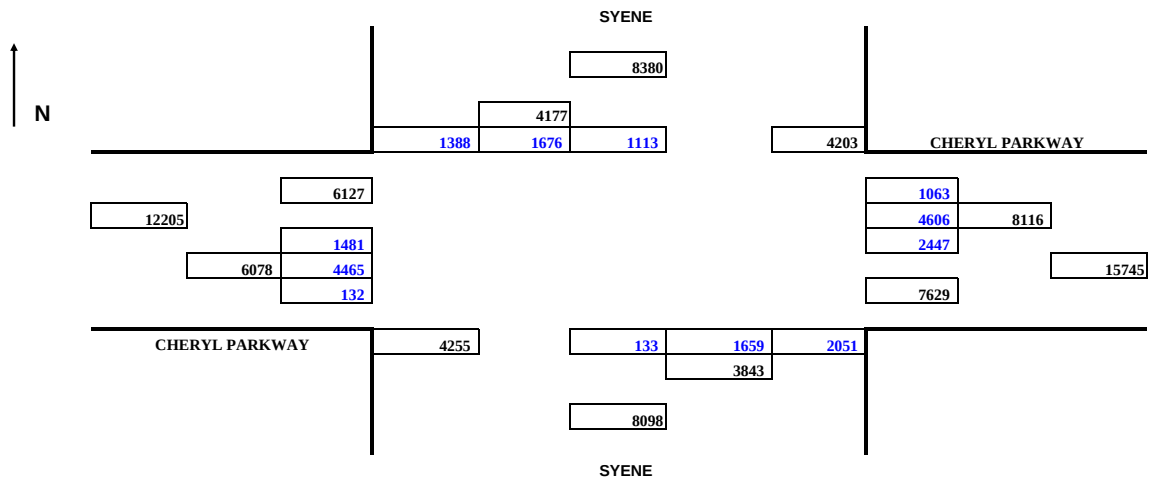
ALT C: 2035 BACKGROUND
LOCATION 13: NOBEL - LACY



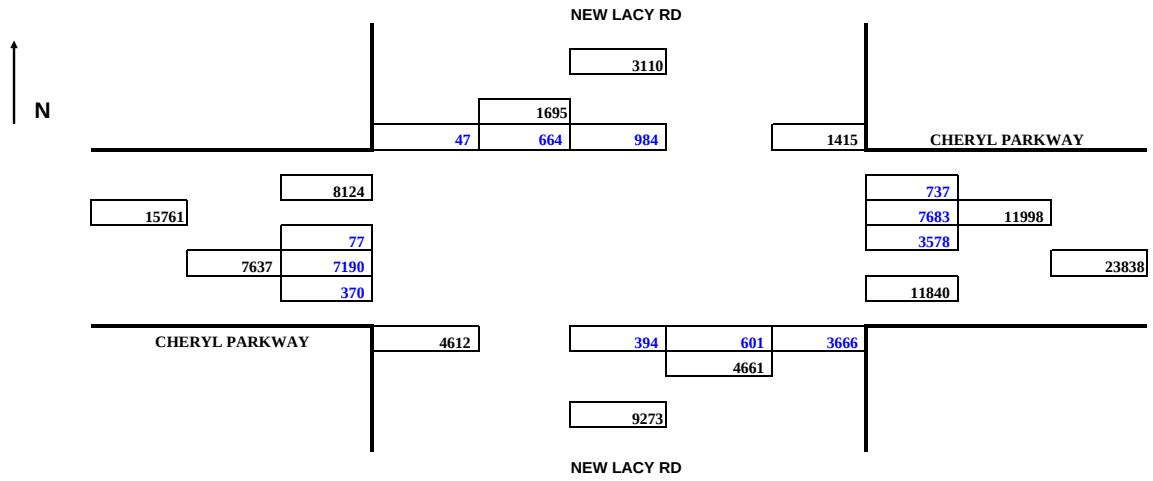
ALT C: 2035 BACKGROUND
LOCATION 14: IRISH - SYENE



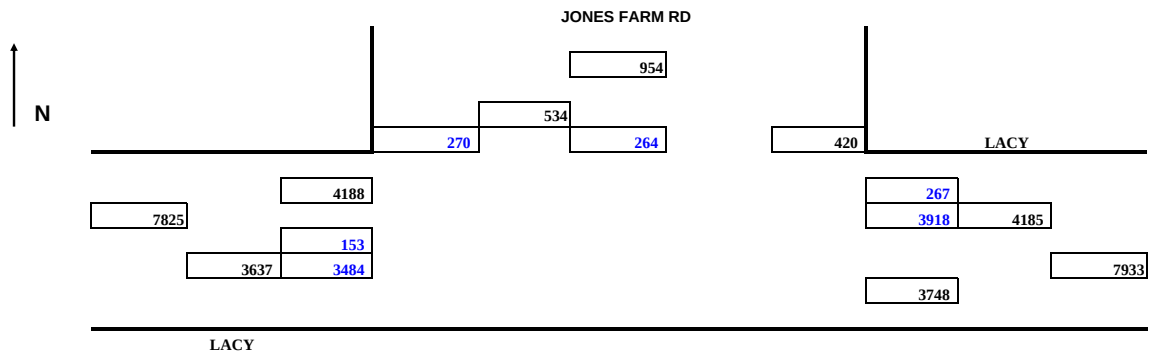
ALT C: 2035 BACKGROUND
LOCATION 15: CHERYL PARKWAY - SYENE



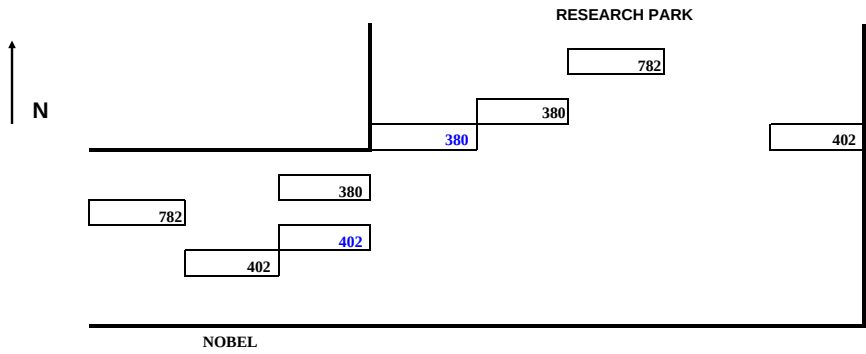
ALT C: 2035 BACKGROUND
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



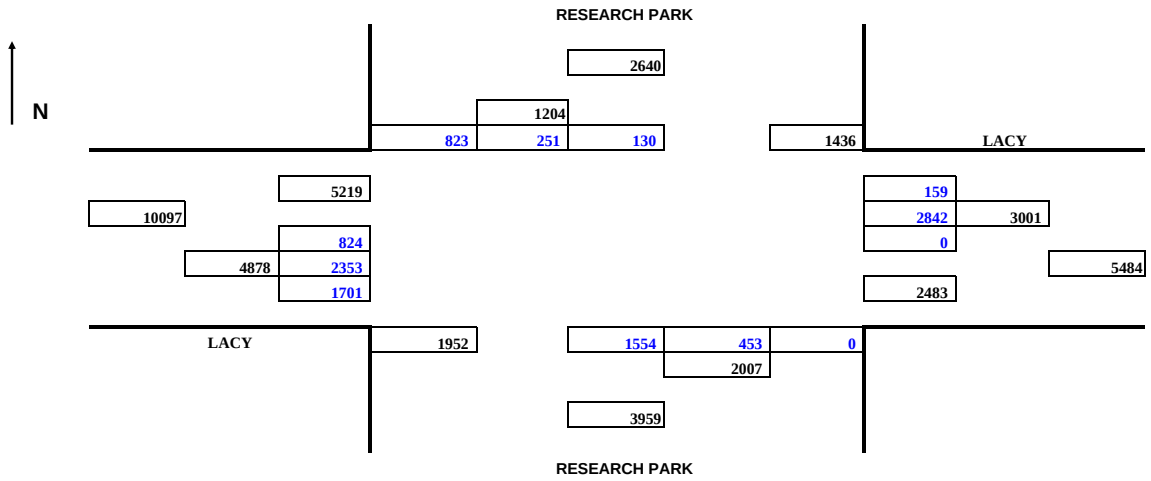
ALT C: 2035 BACKGROUND
LOCATION 17: LACY - JONES FARM RD



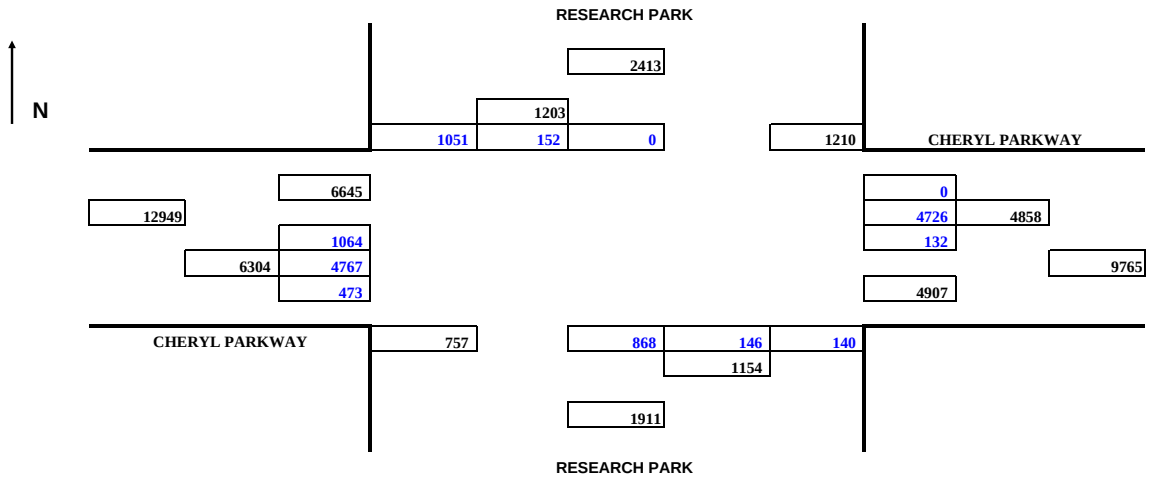
ALT C: 2035 BACKGROUND
LOCATION 19: NOBEL - RESEARCH PARK



ALT C: 2035 BACKGROUND
LOCATION 20: LACY - RESEARCH PARK

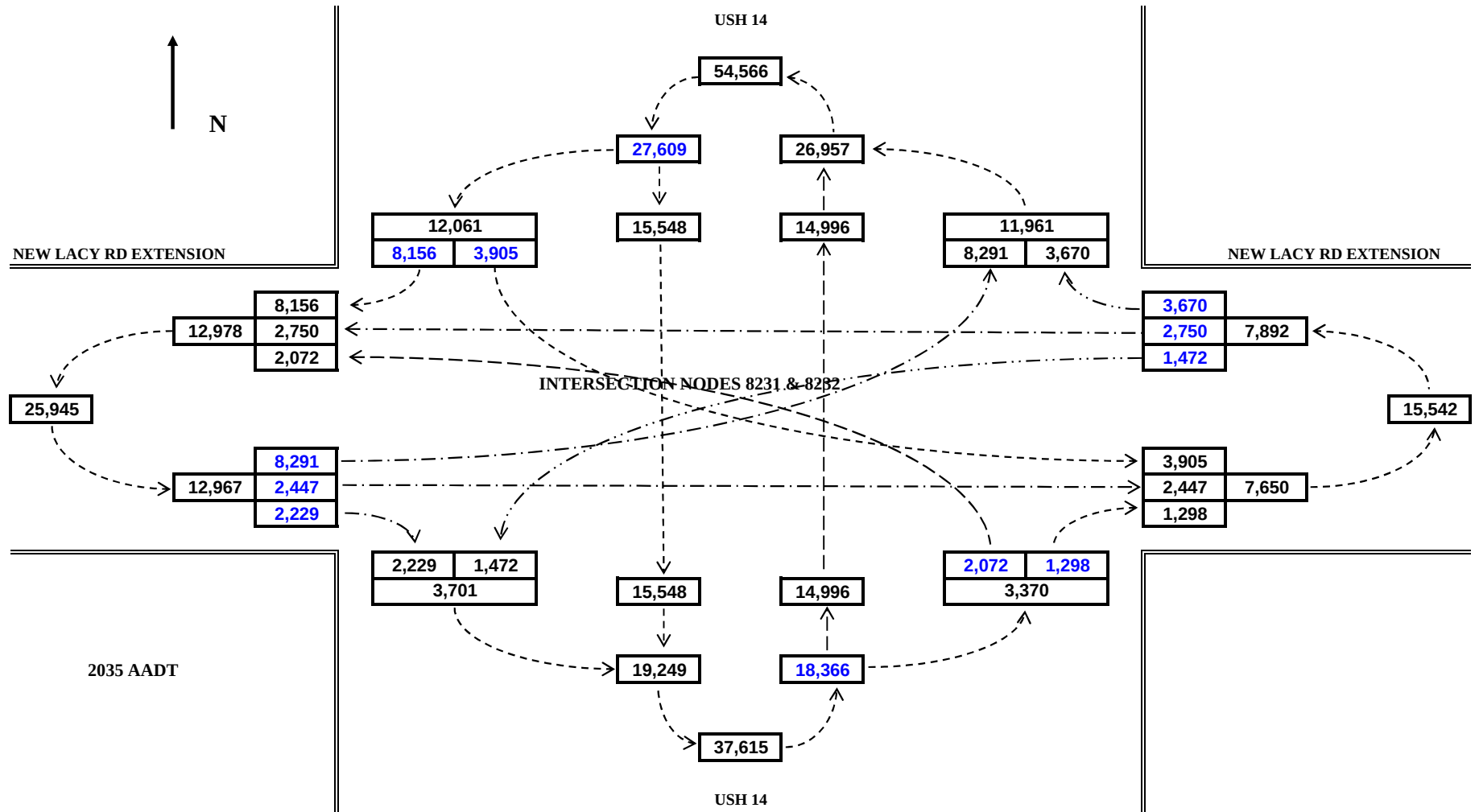


ALT C: 2035 BACKGROUND
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT C: 2035 BACKGROUND

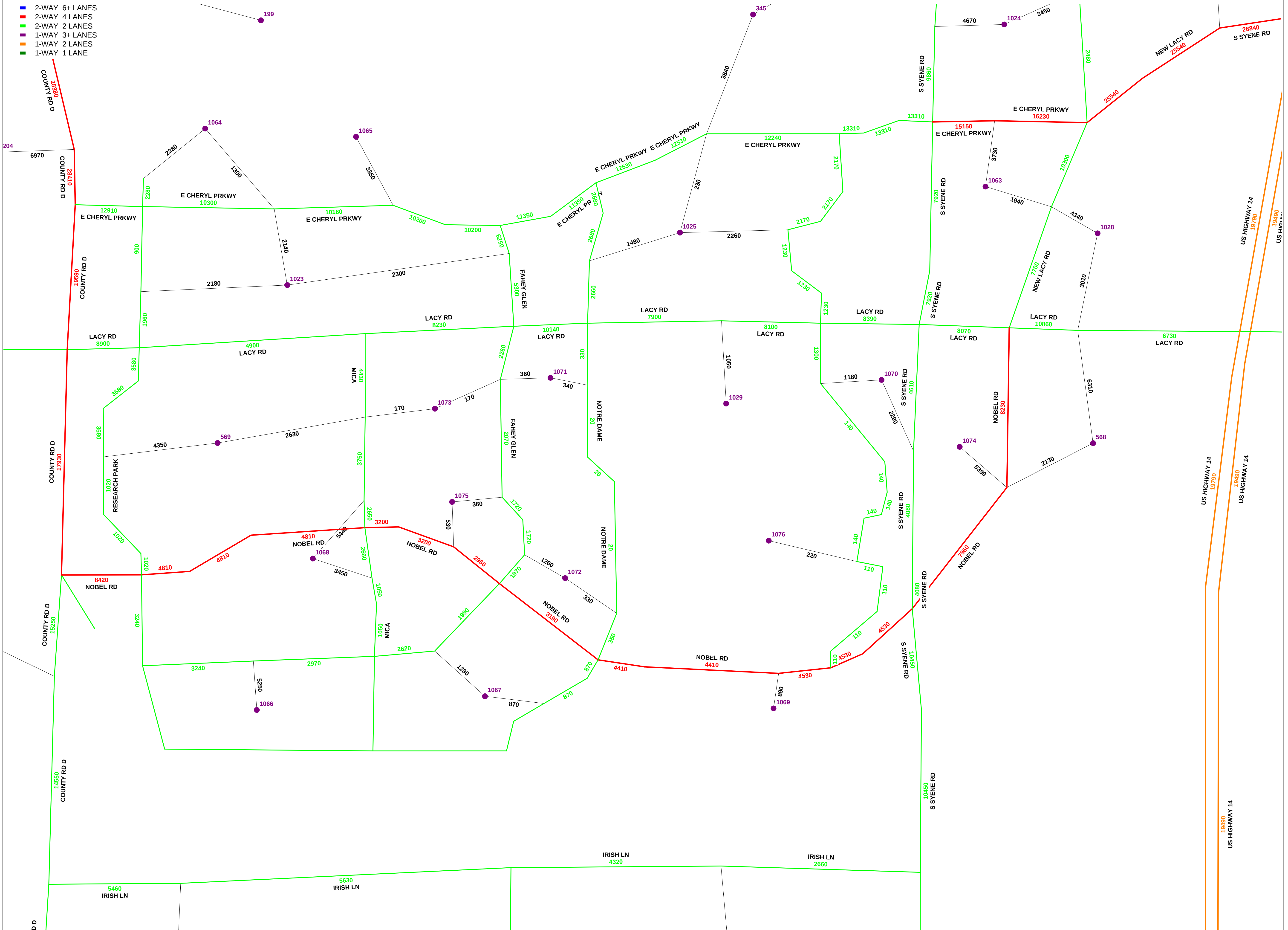
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



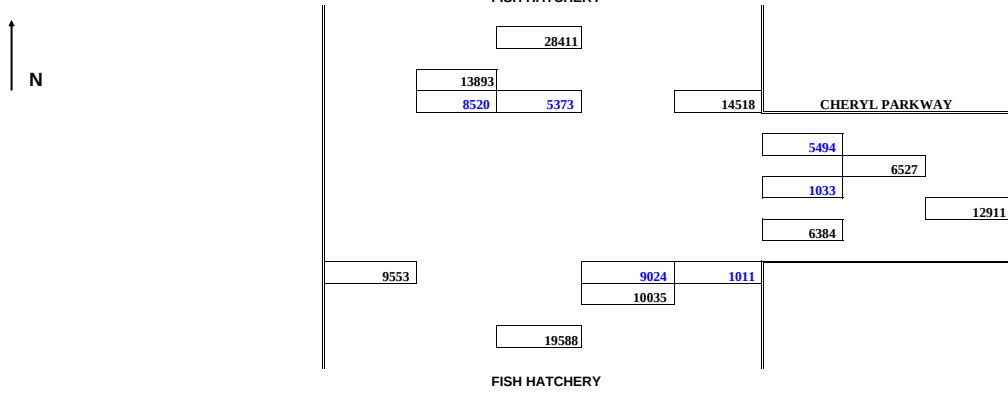
APPENDIX A

MPO Year 2035 Build Traffic ADT Forecasts

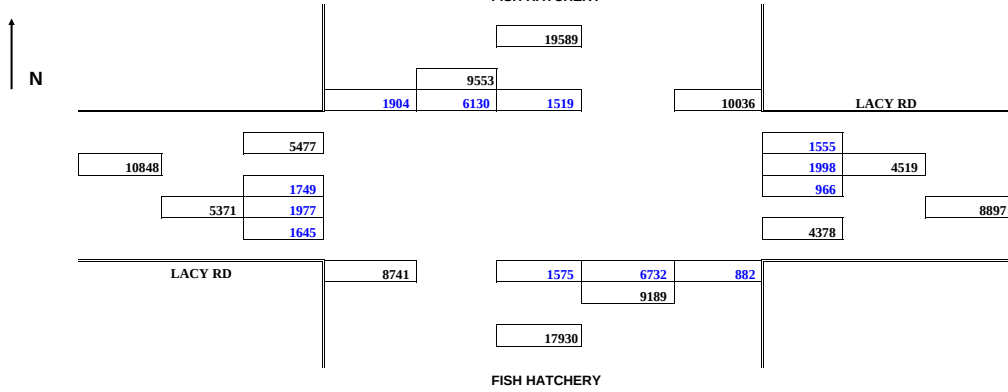
12/18/08



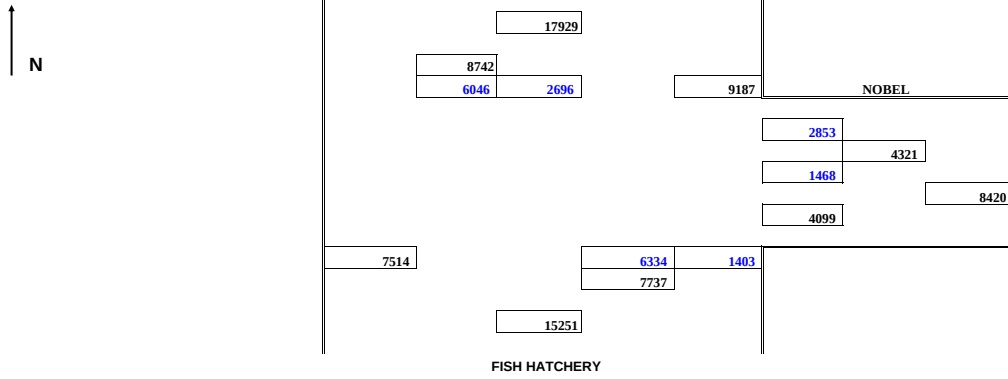
ALT D: 2035 BUILDOUT
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



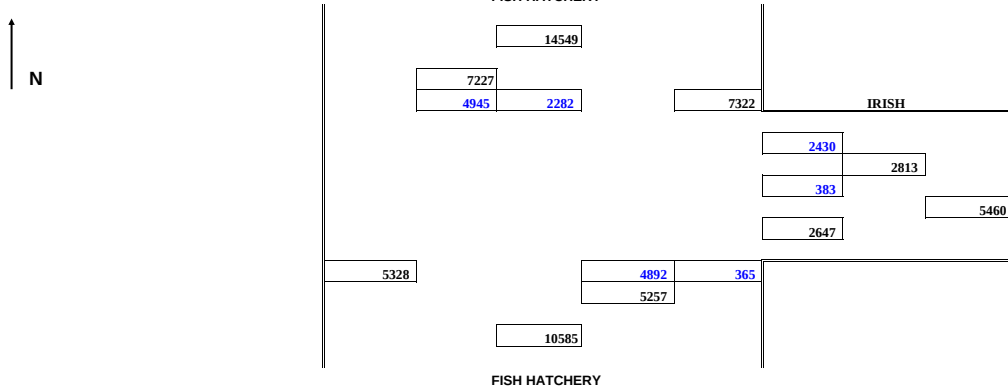
ALT D: 2035 BUILDOUT
LOCATION 2: FISH HATCHERY - LACY



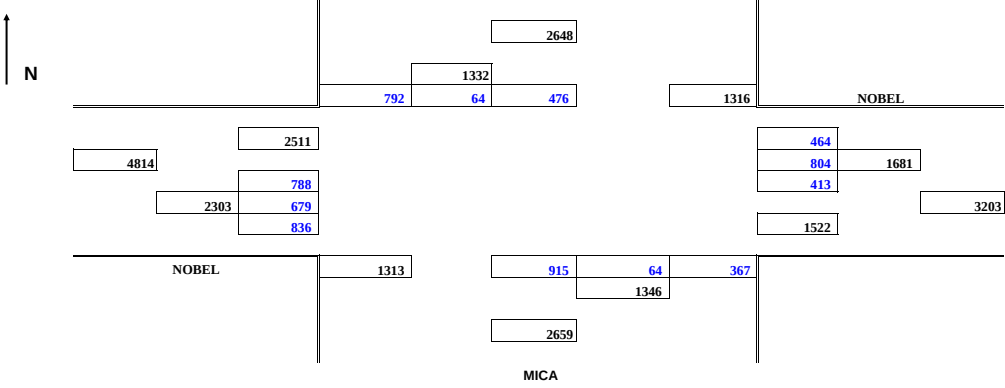
ALT D: 2035 BUILDOUT
LOCATION 3: FISH HATCHERY - NOBEL



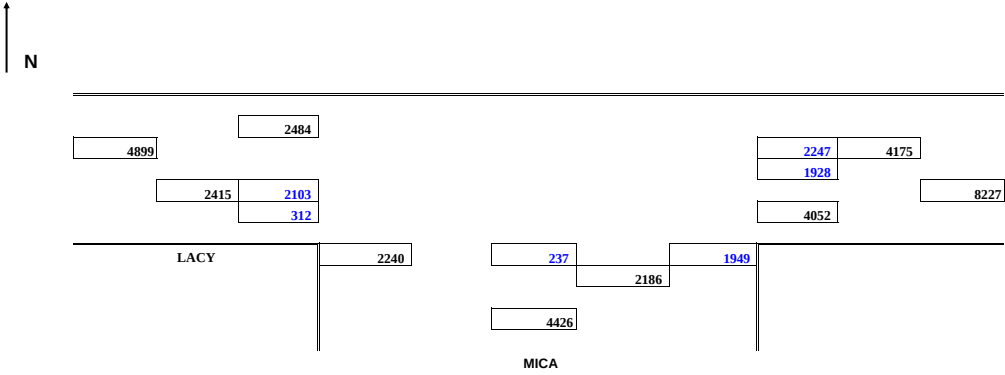
ALT D: 2035 BUILDOUT
LOCATION 4: FISH HATCHERY - IRISH



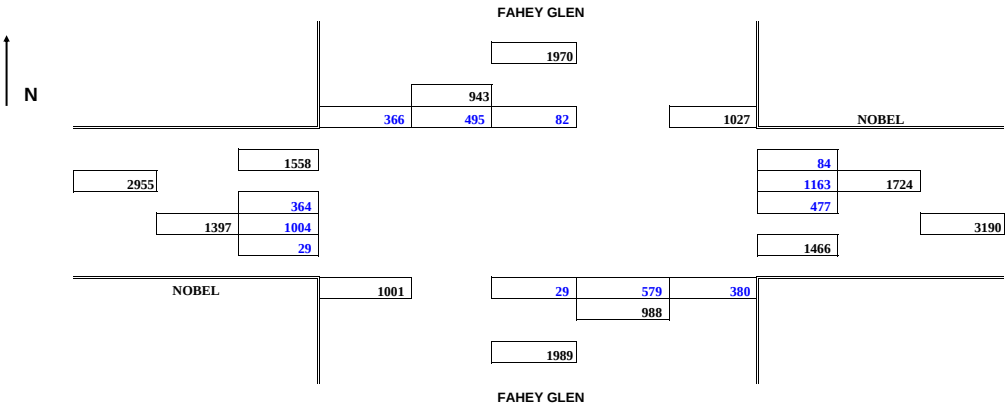
ALT D: 2035 BUILDOUT
LOCATION 5: NOBEL - MICA



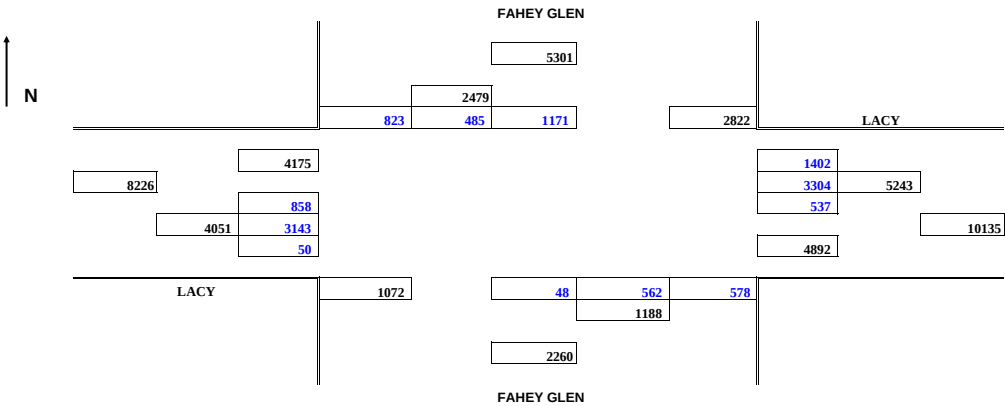
ALT D: 2035 BUILDOUT
LOCATION 6: LACY - MICA



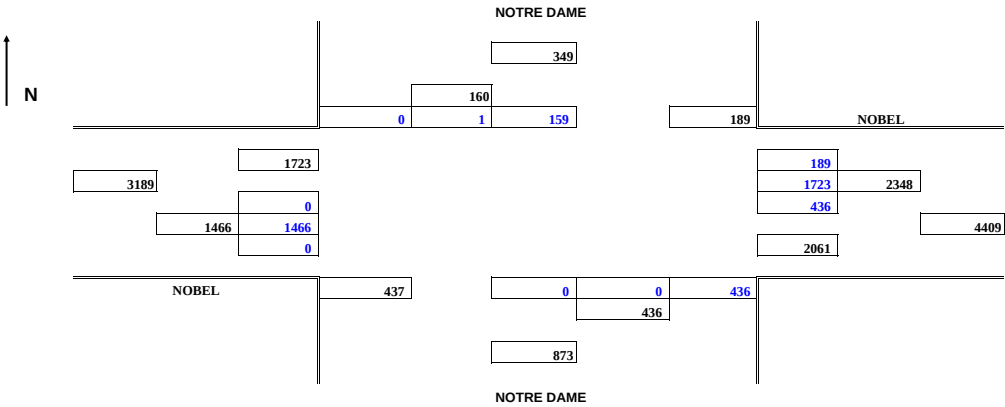
ALT D: 2035 BUILDOUT
LOCATION 7: NOBEL - FAHEY GLEN



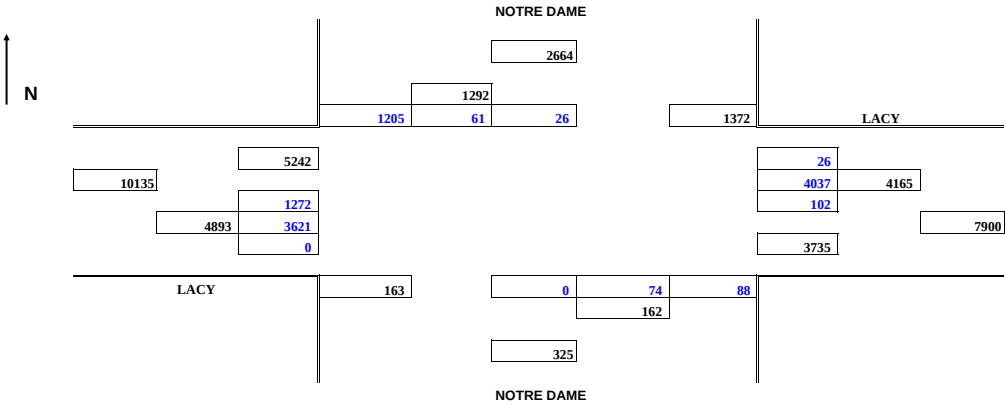
ALT D: 2035 BUILDOUT
LOCATION 8: LACY - FAHEY GLEN



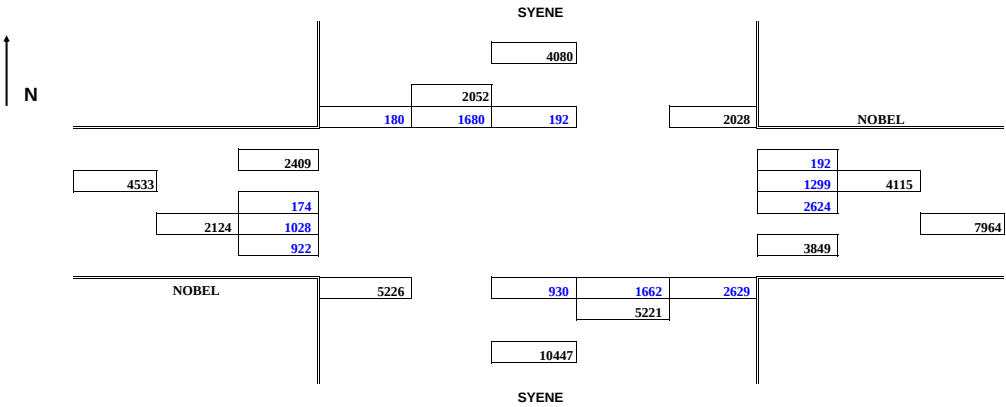
ALT D: 2035 BUILDOUT
LOCATION 9: NOBEL - NOTRE DAME



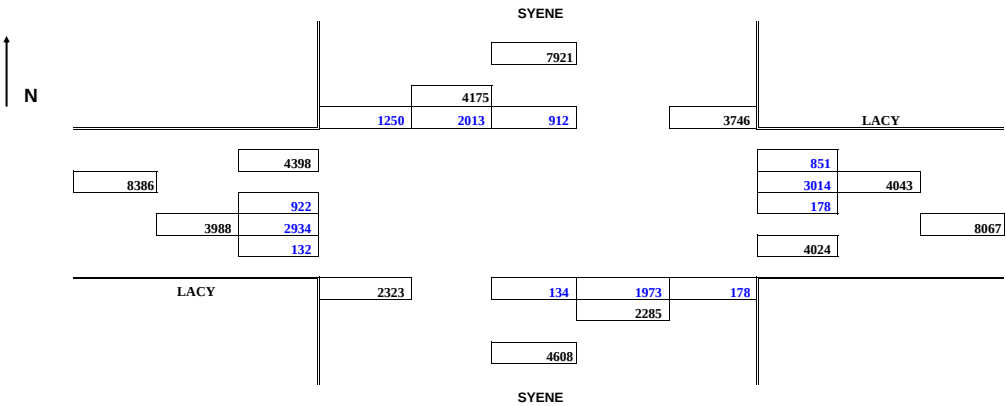
ALT D: 2035 BUILDOUT
LOCATION 10: LACY - NOTRE DAME



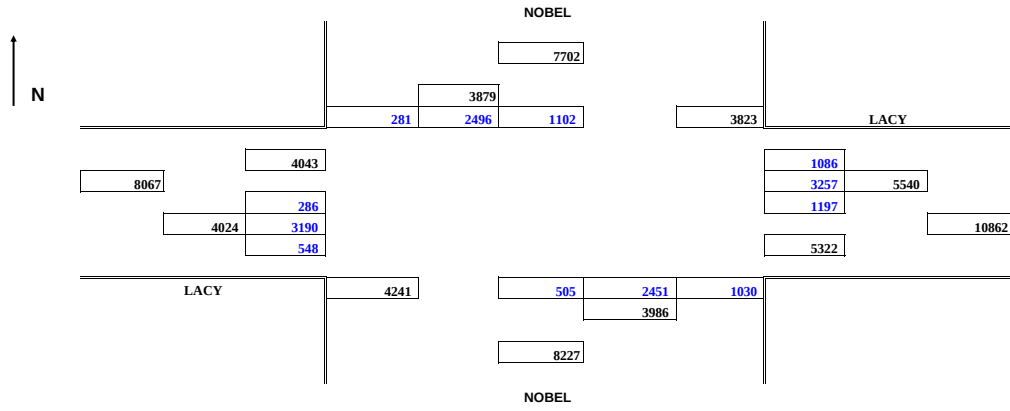
ALT D: 2035 BUILDOUT
LOCATION 11: NOBEL - SYENE



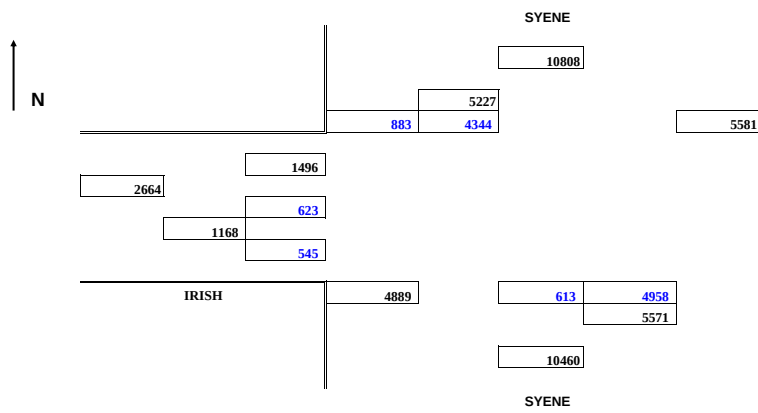
ALT D: 2035 BUILDOUT
LOCATION 12: LACY - SYENE



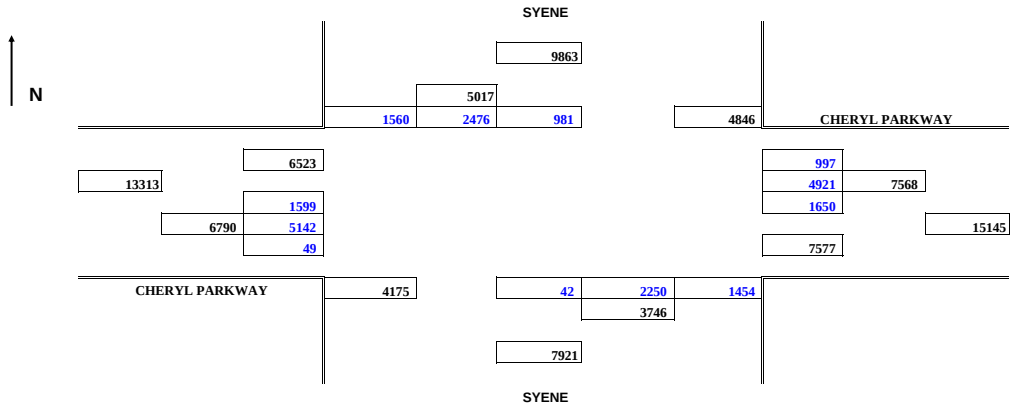
ALT D: 2035 BUILDOUT
LOCATION 13: NOBEL - LACY



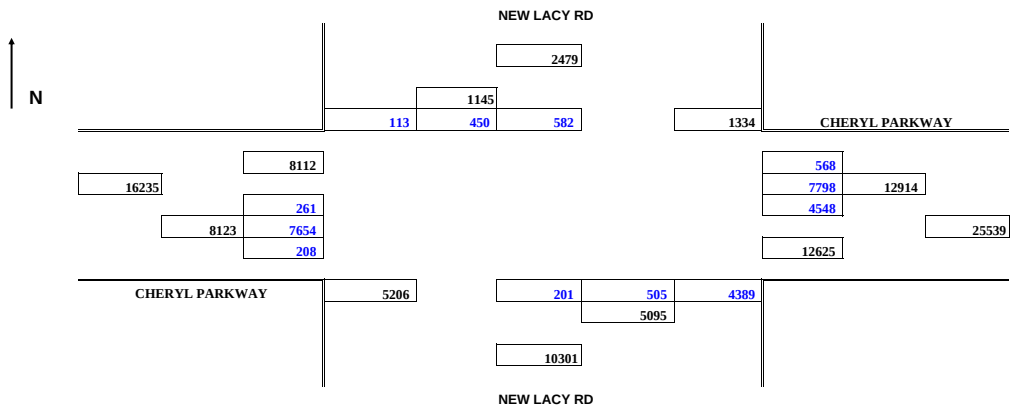
ALT D: 2035 BUILDOUT
LOCATION 14: IRISH - SYENE



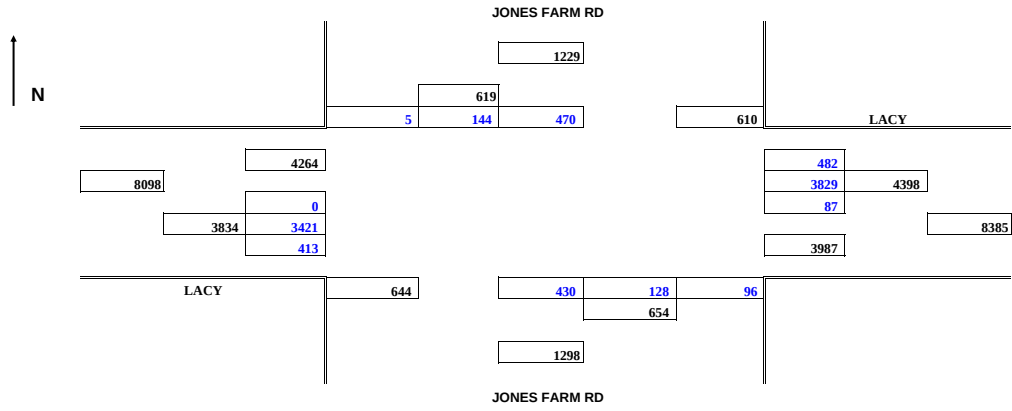
ALT D: 2035 BUILDOUT
LOCATION 15: CHERYL PARKWAY - SYENE



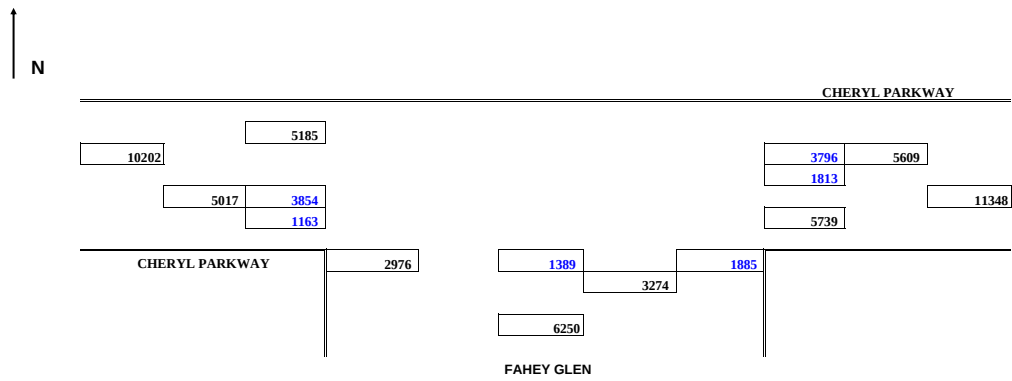
ALT D: 2035 BUILDOUT
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



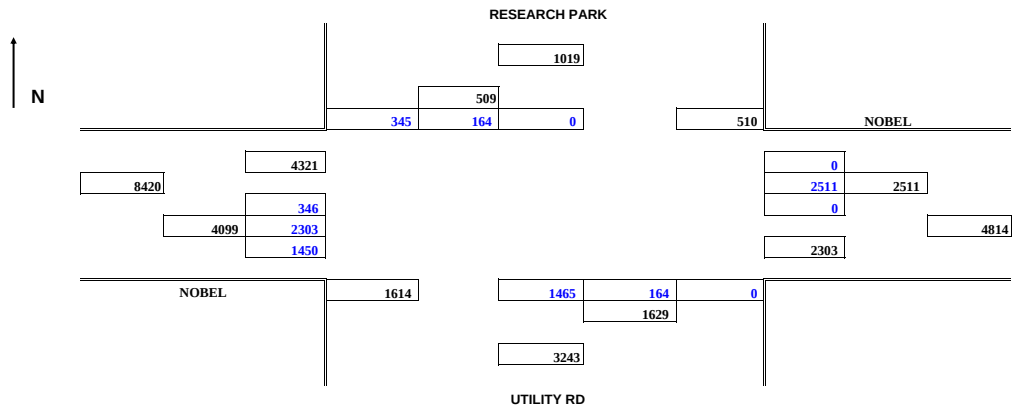
ALT D: 2035 BUILDOUT
LOCATION 17: LACY - JONES FARM RD



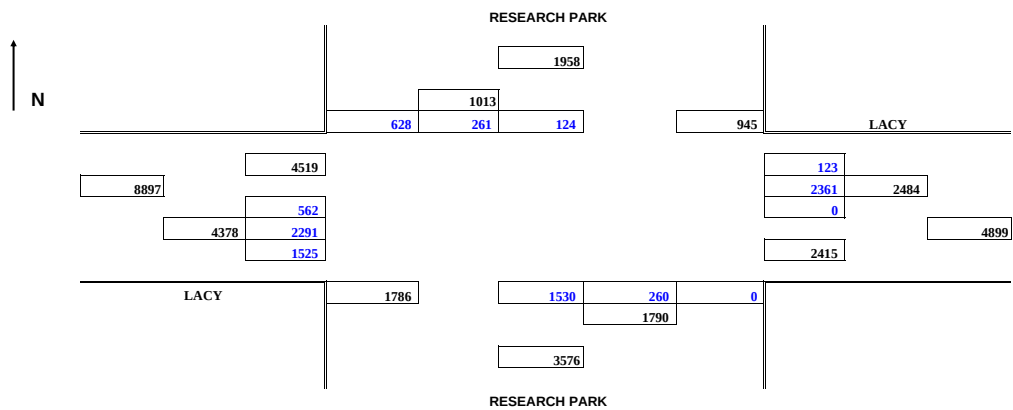
ALT D: 2035 BUILDOUT
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



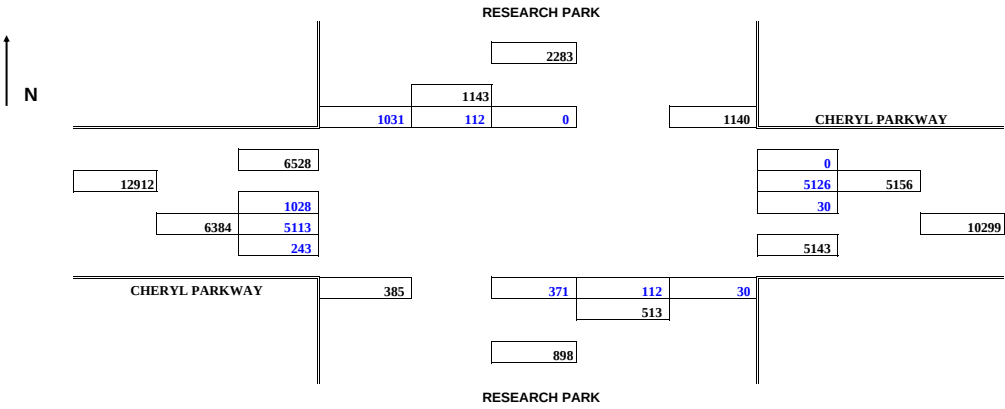
ALT D: 2035 BUILDOUT
LOCATION 19: NOBEL - RESEARCH PARK



ALT D: 2035 BUILDOUT
LOCATION 20: LACY - RESEARCH PARK

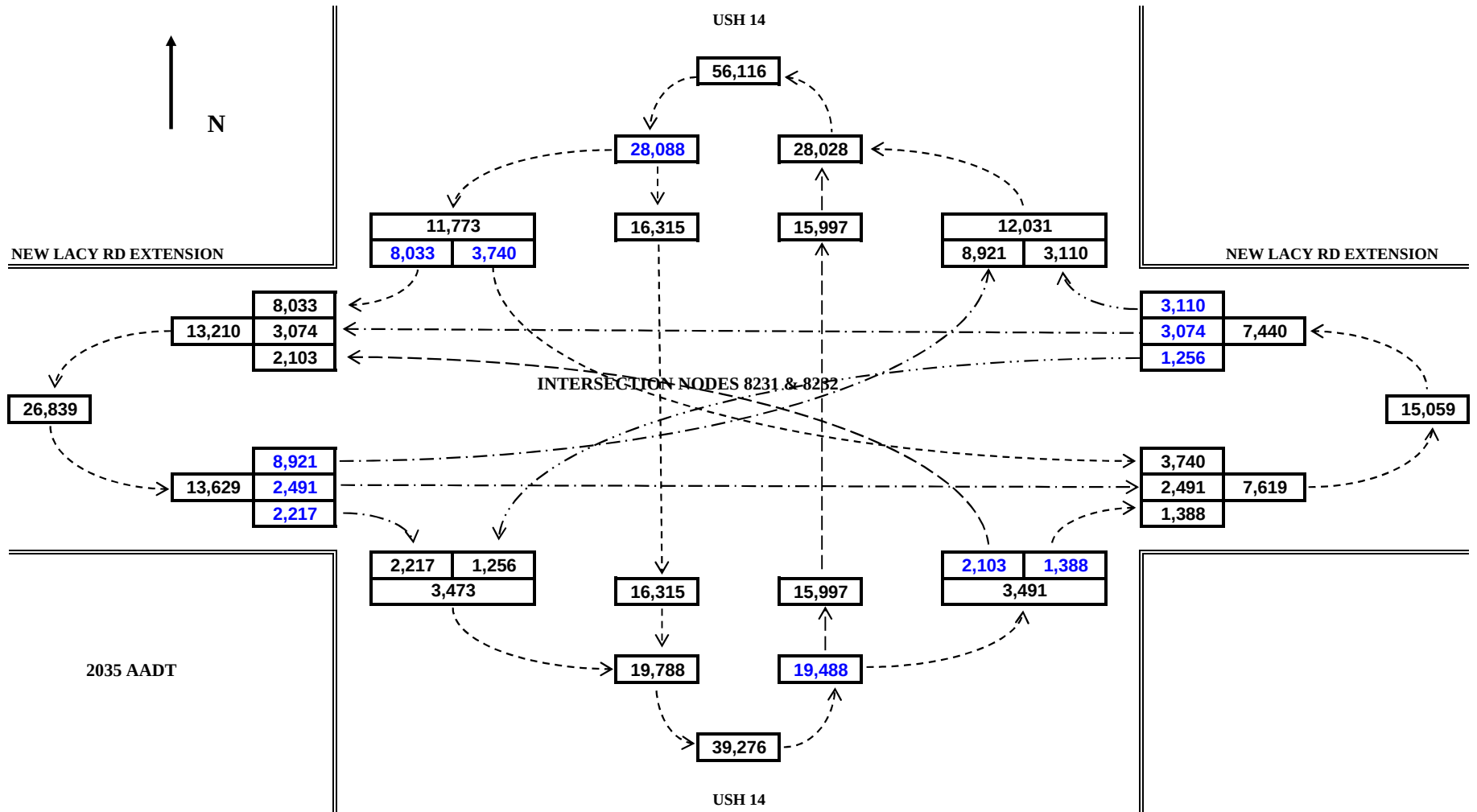


ALT D: 2035 BUILDOUT
LOCATION 21: CHERYL PARKWAY - RESEARCH PARK



ALT D: 2035 BUILDOUT

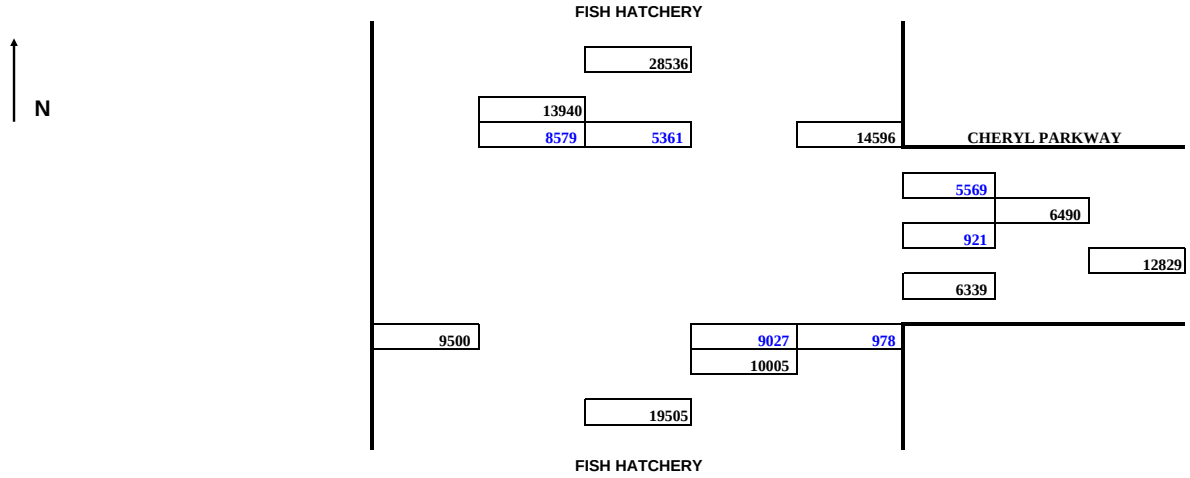
LOCATION 22: USH 14 - NEW LACY RD INTERCHANGE



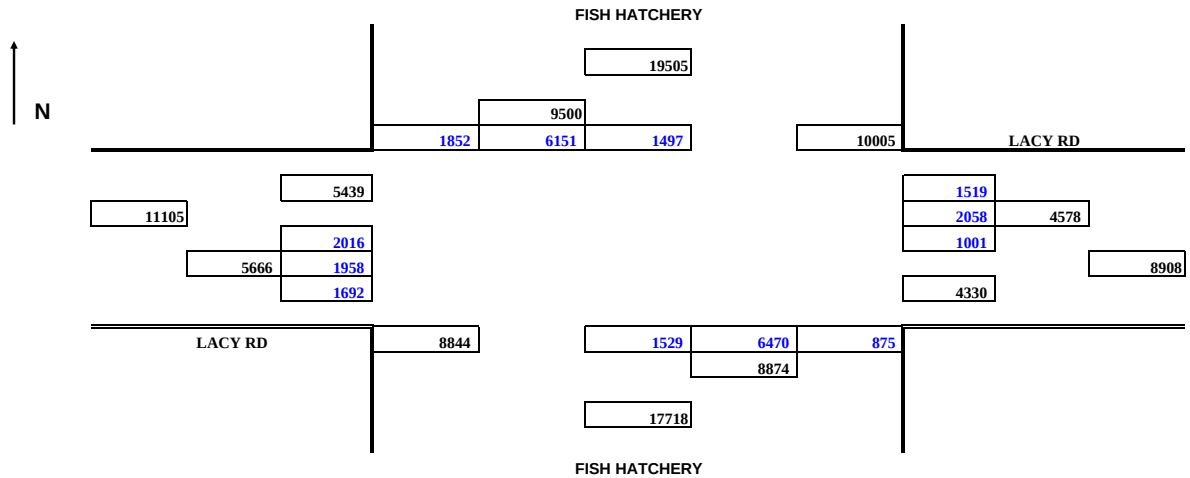
12/18/08

Licensed to Wisconsin Department of Transportation

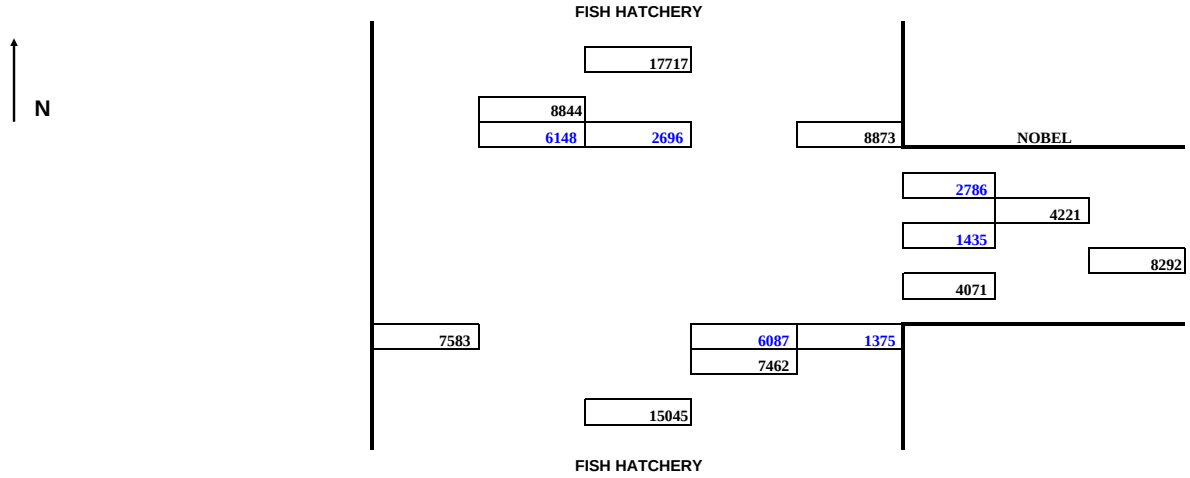
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 1: FISH HATCHERY-CHERYL PARKWAY



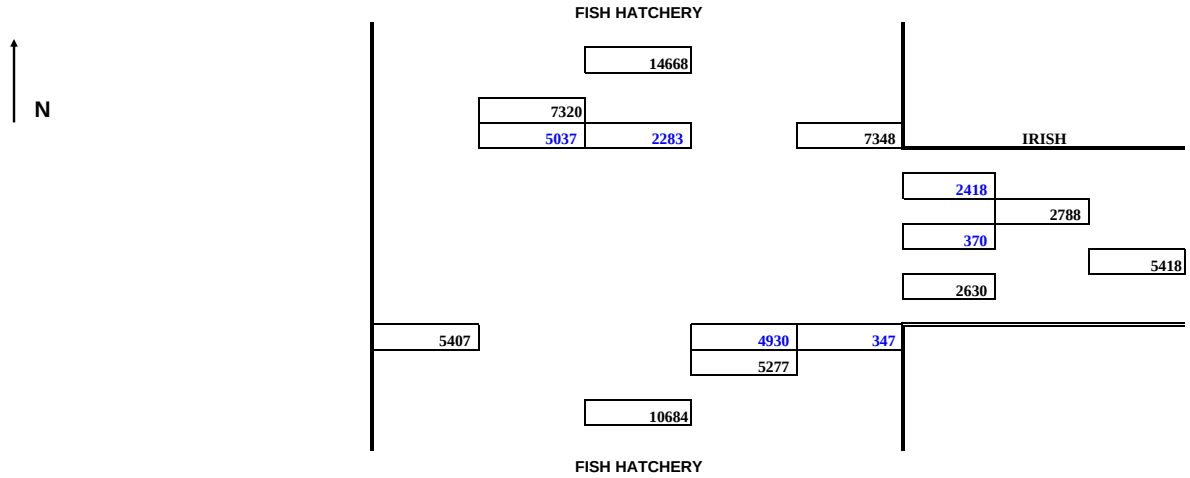
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 2: FISH HATCHERY - LACY



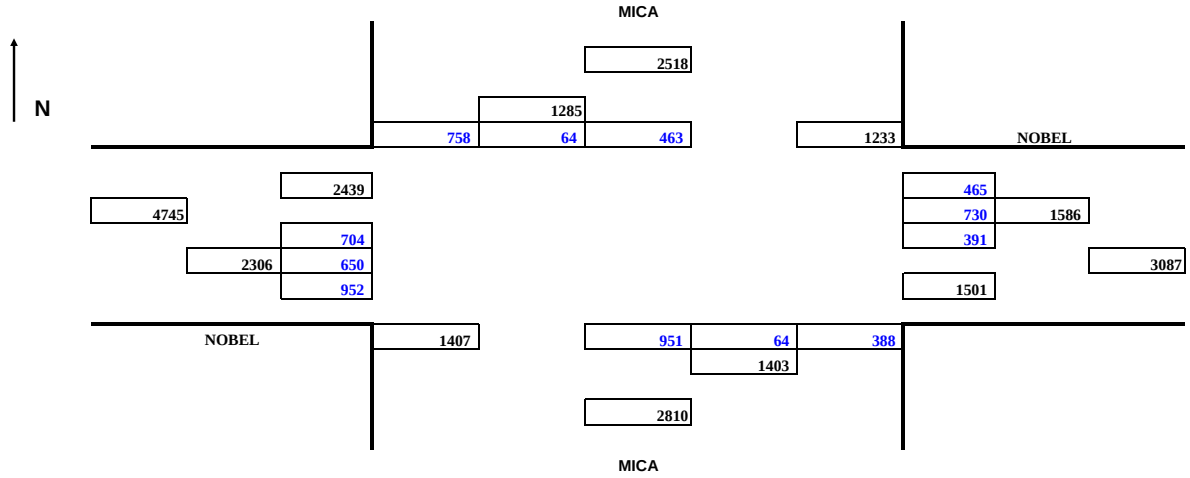
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 3: FISH HATCHERY - NOBEL



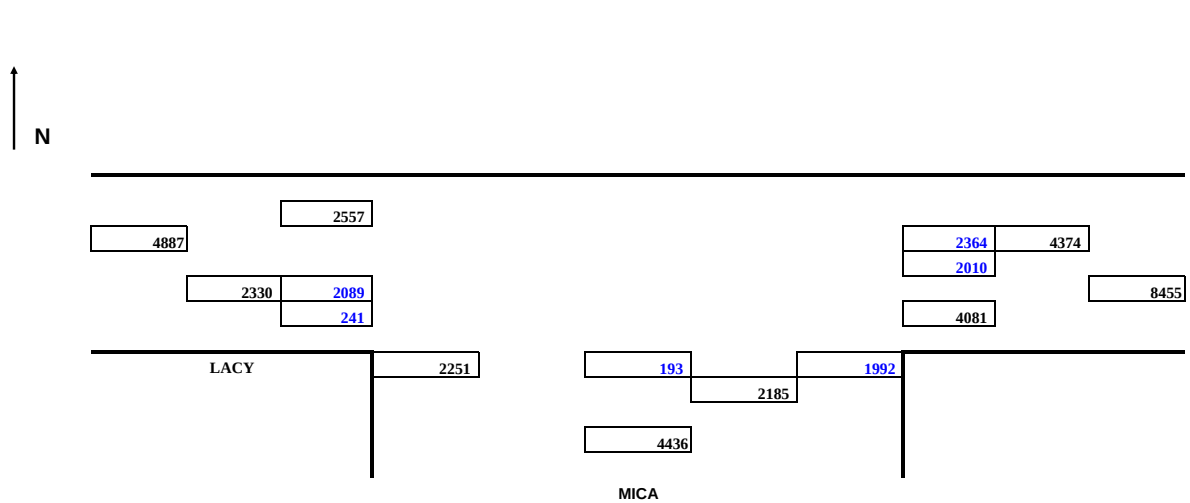
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 4: FISH HATCHERY - IRISH



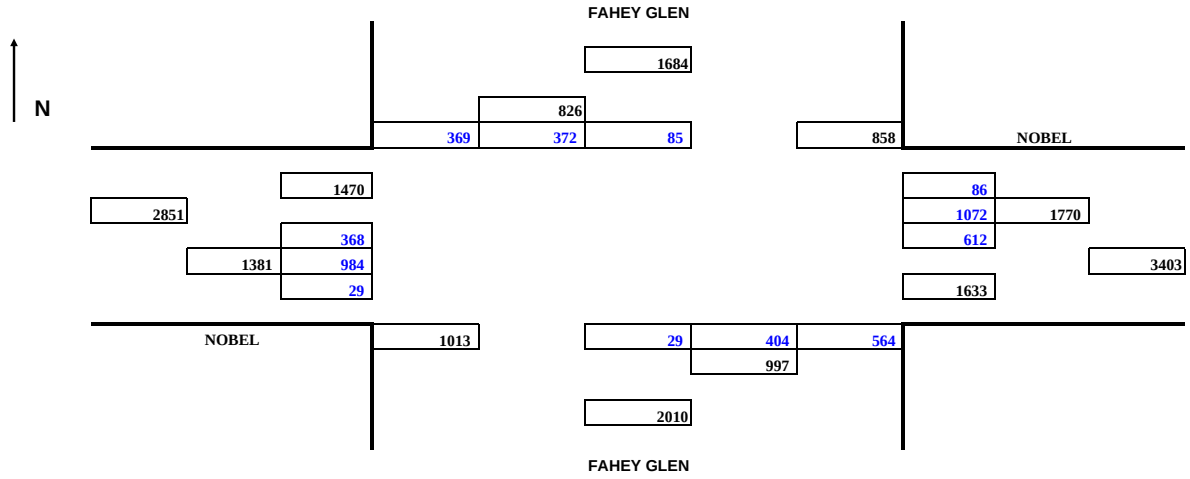
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 5: NOBEL - MICA



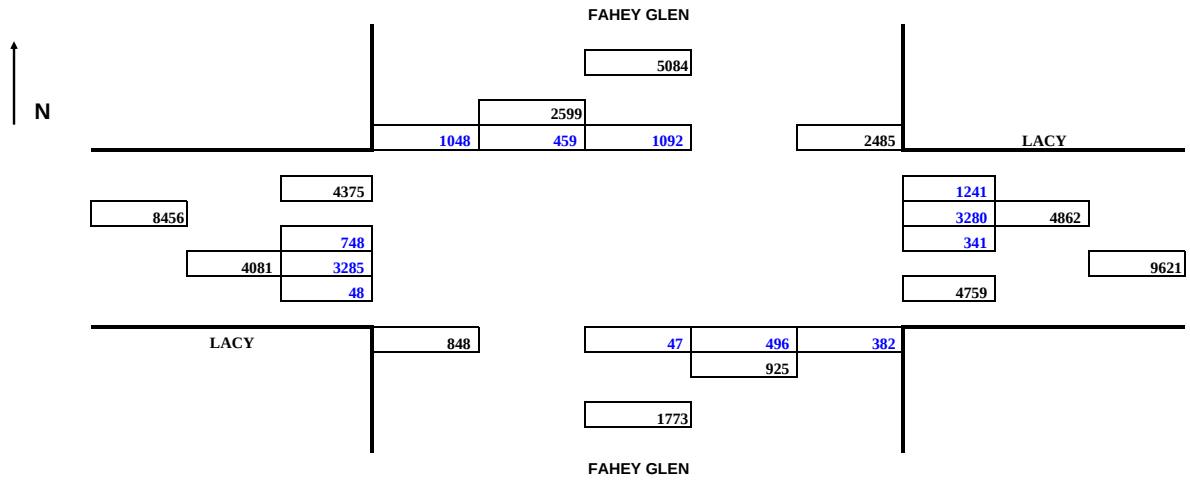
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 6: LACY - MICA



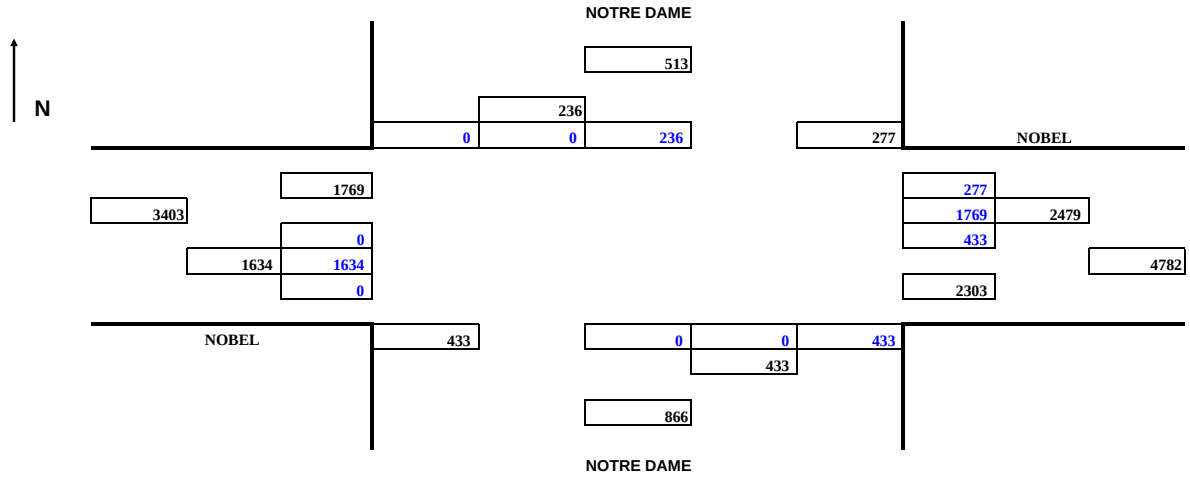
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 7: NOBEL - FAHEY GLEN



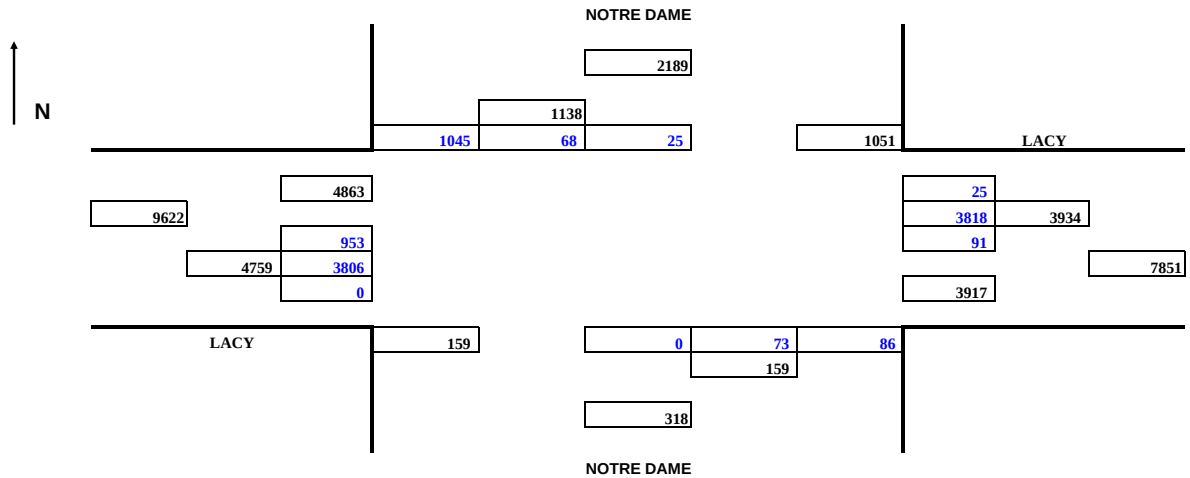
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 8: LACY - FAHEY GLEN



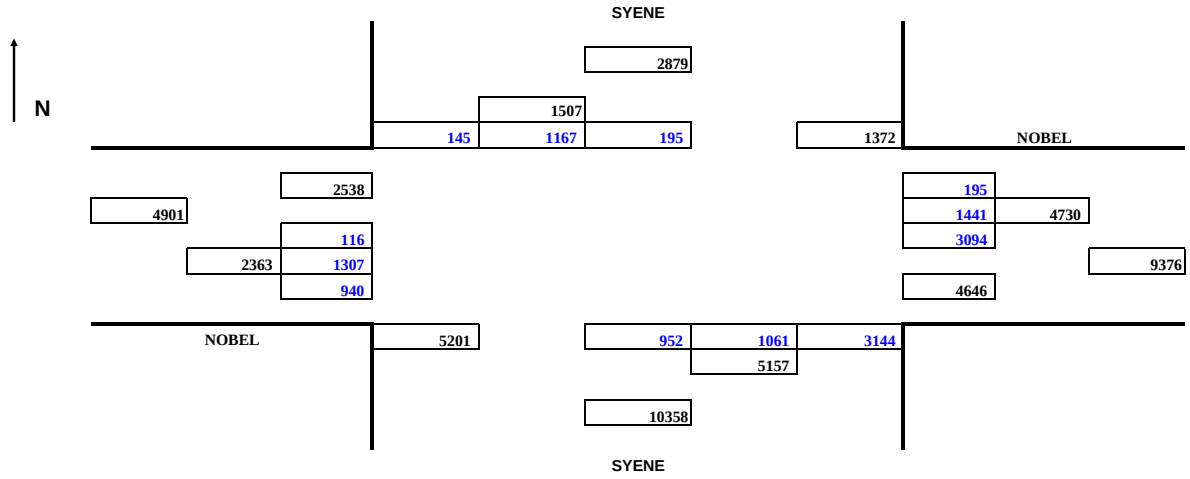
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 9: NOBEL - NOTRE DAME



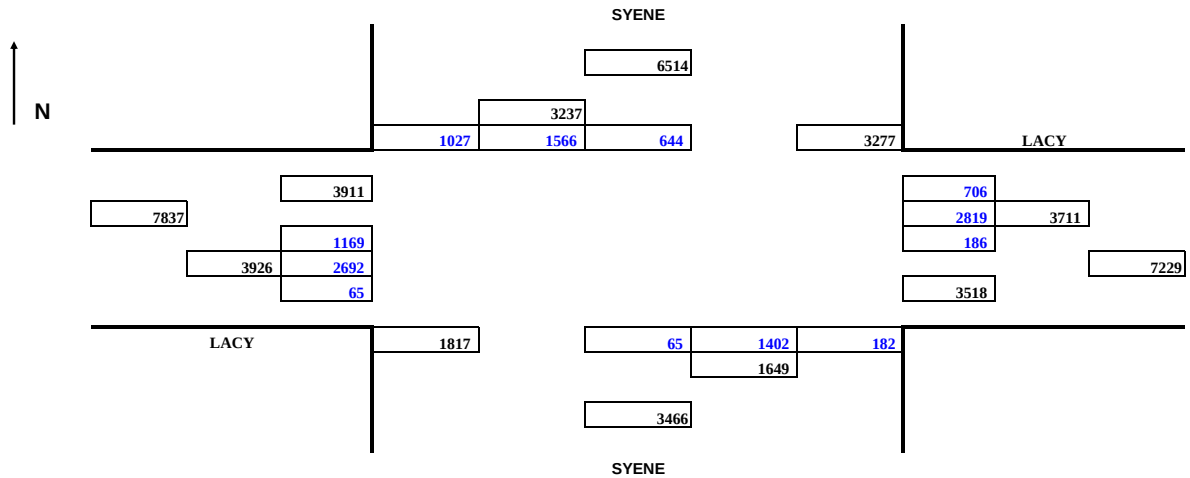
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 10: LACY - NOTRE DAME



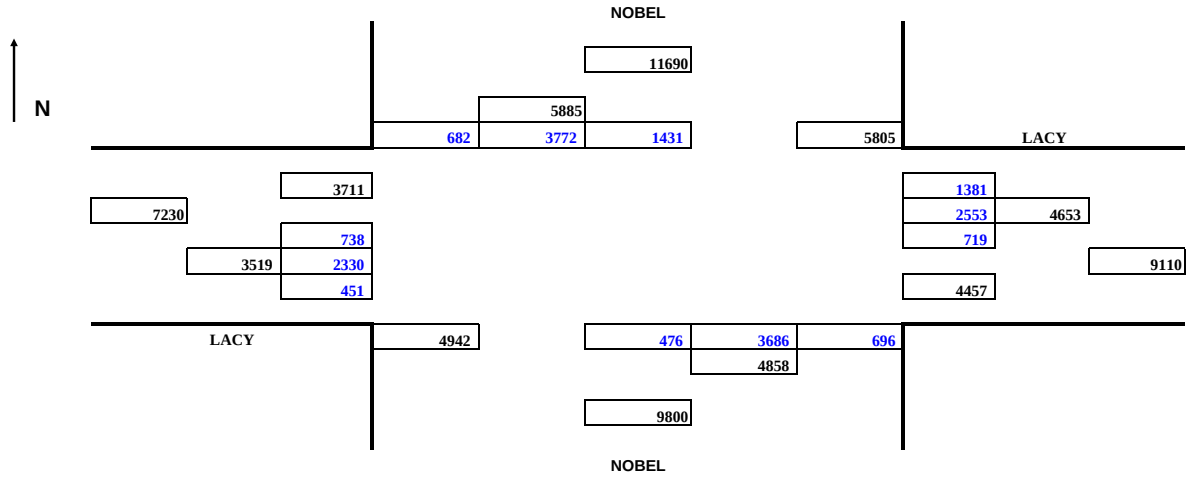
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 11: NOBEL - SYENE



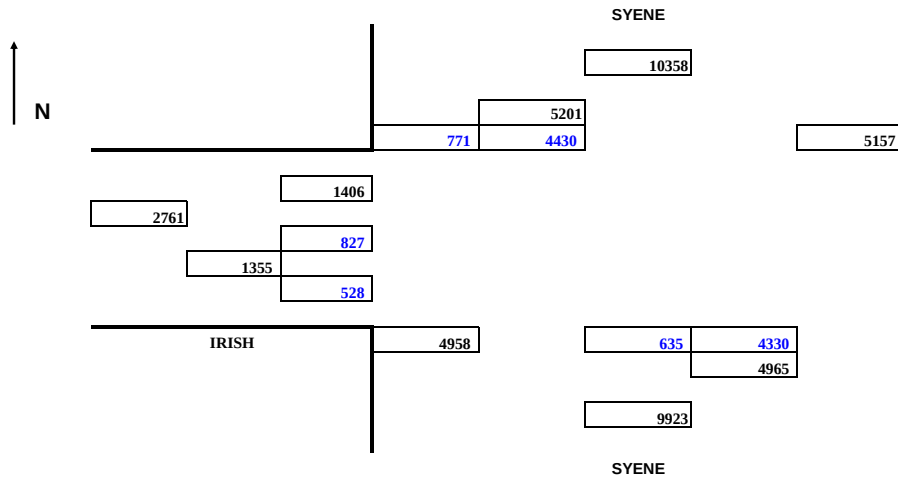
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 12: LACY - SYENE



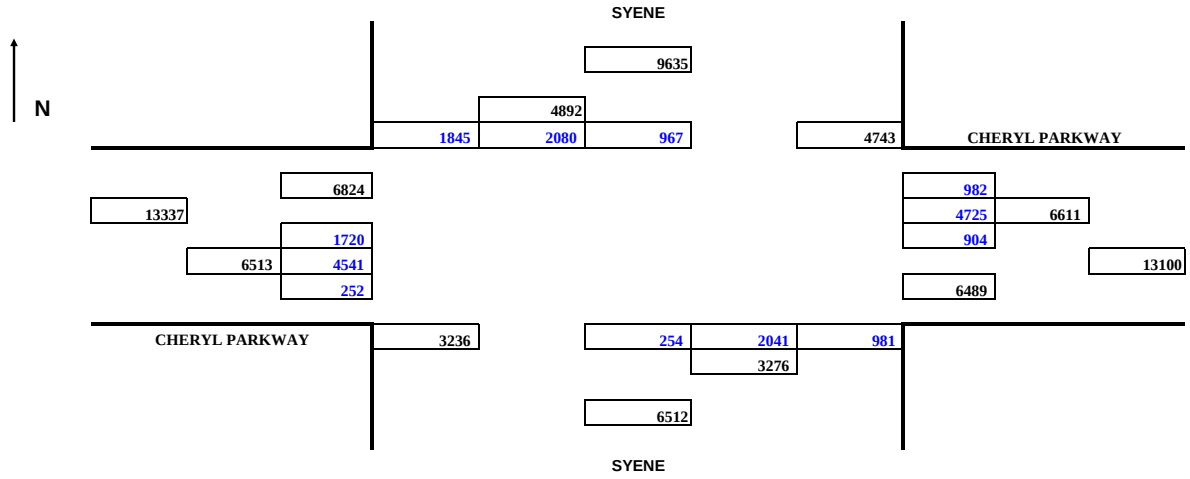
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 13: NOBEL - LACY



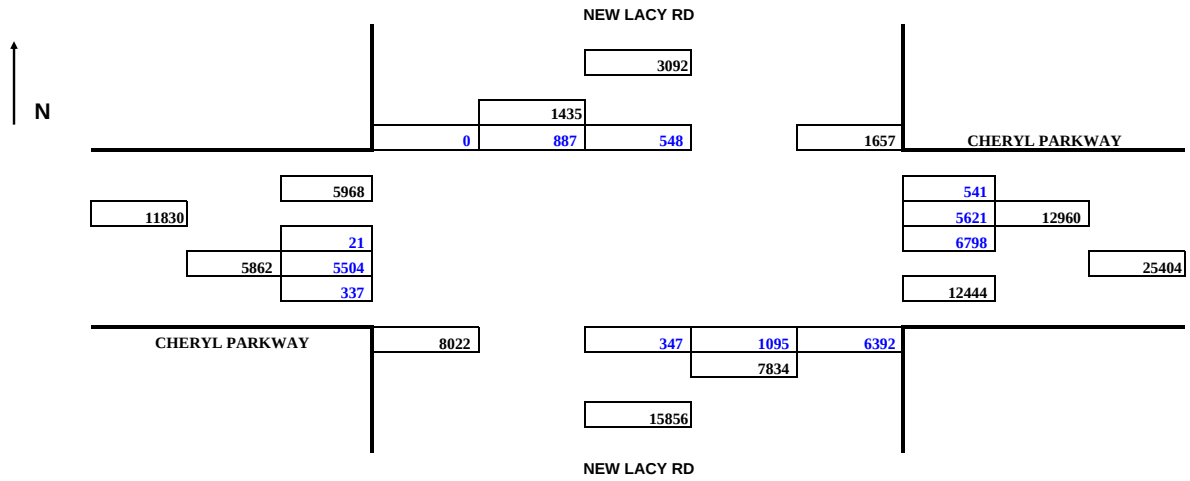
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 14: IRISH - SYENE



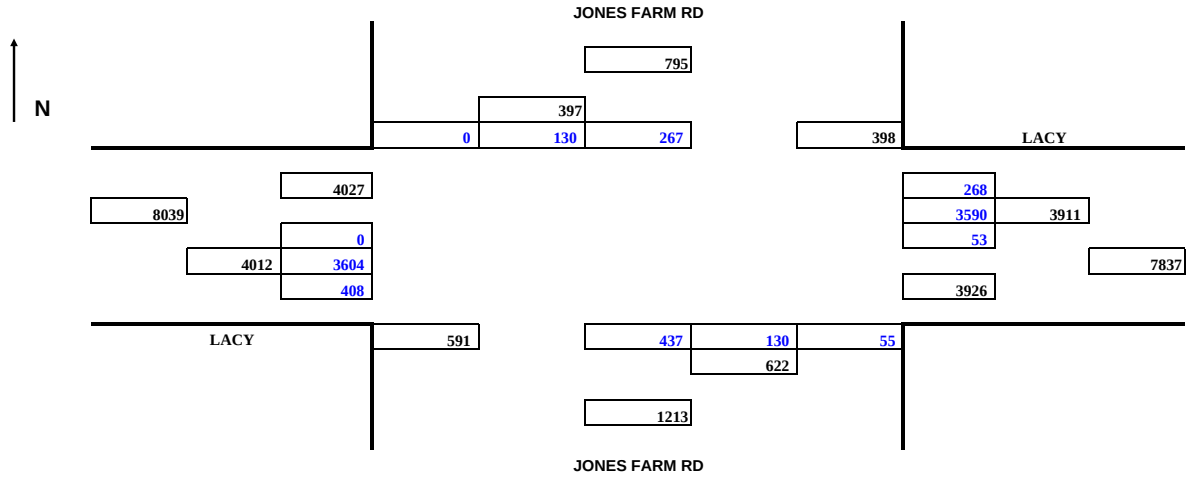
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 15: CHERYL PARKWAY - SYENE



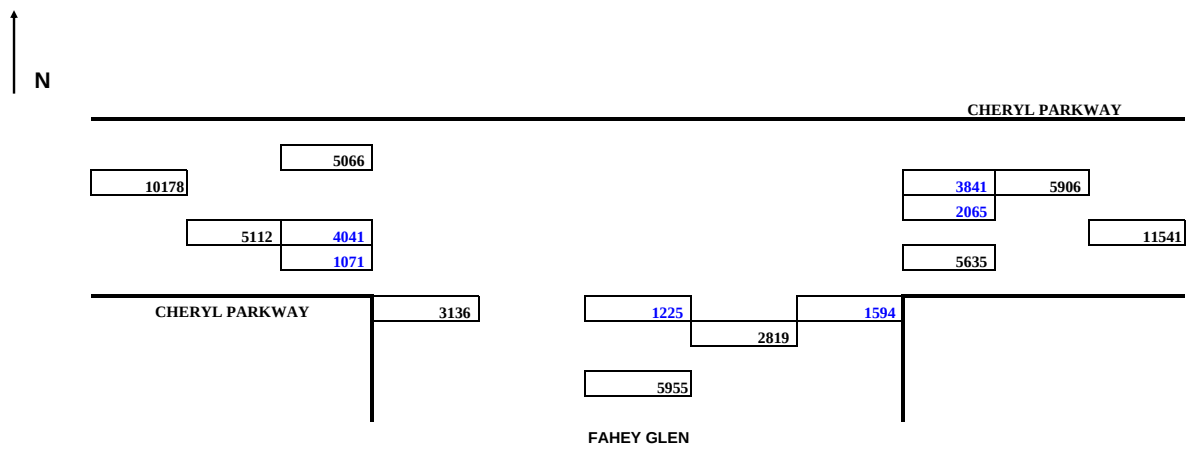
ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 16: CHERYL PARKWAY - NEW LACY RD



ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 17: LACY - JONES FARM RD

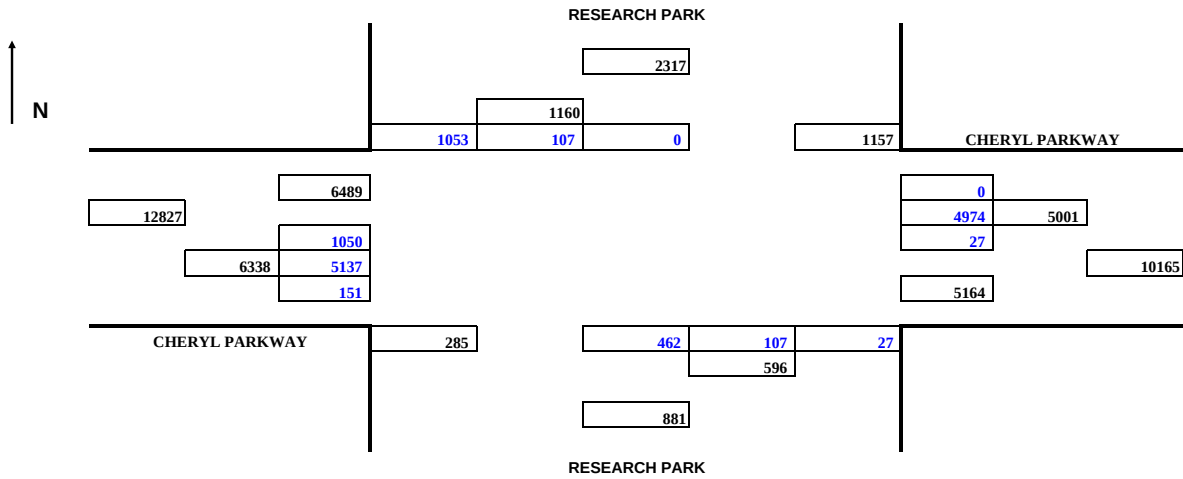


ALT D2: 2035 BUILDOUT + 4-LANE NEW LACY SECTION
LOCATION 18: CHERYL PARKWAY - FAHEY GLEN



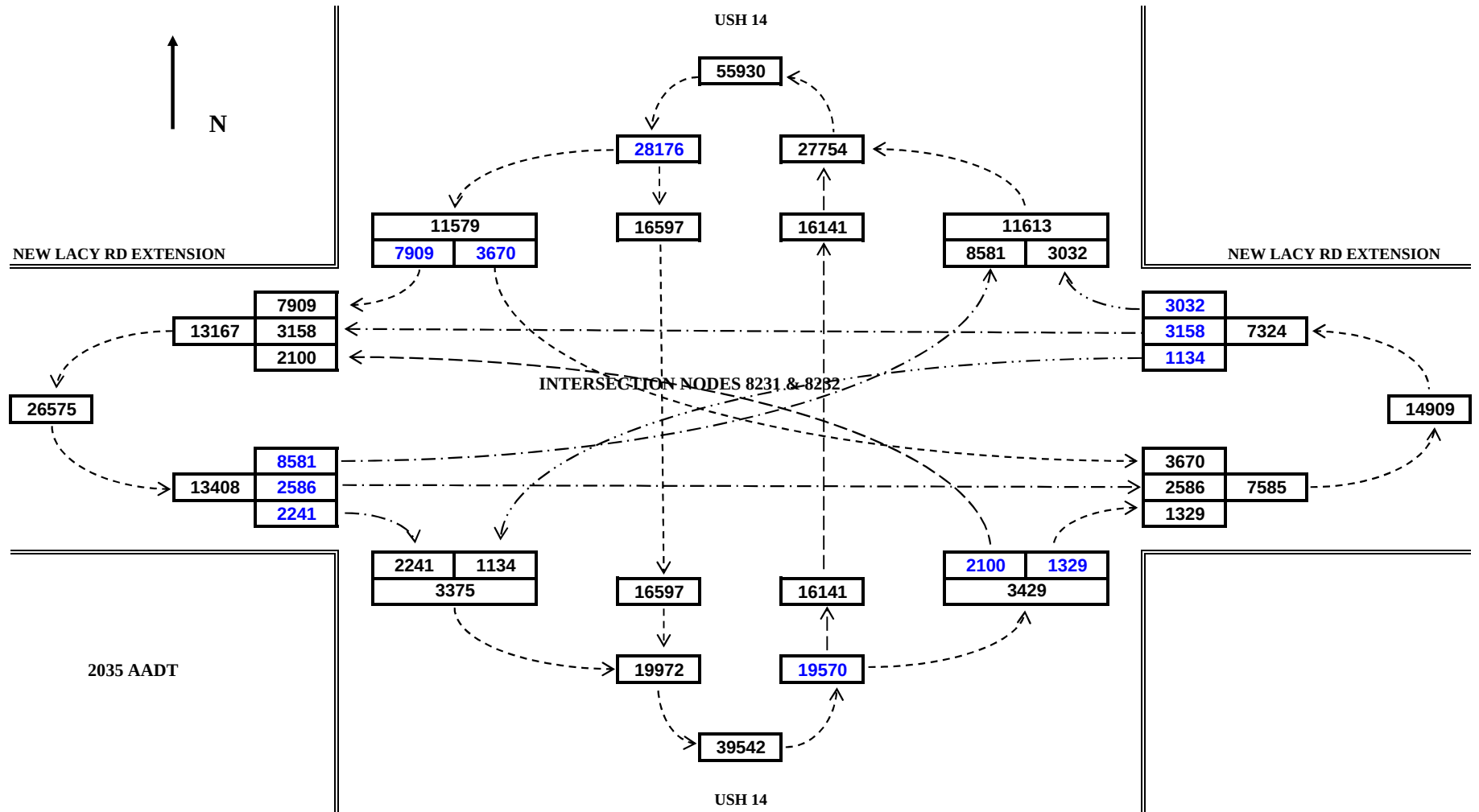
Map of the study area showing the location of the research park and utility road. The map includes a north arrow pointing upwards. The research park is located in the upper right quadrant, and the utility road is in the lower right quadrant. The map shows a network of roads and various labeled areas. The research park area is labeled 'RESEARCH PARK' and contains several labeled areas: 1021, 510, 346, 164, 0, 511, and NOBEL. The utility road area is labeled 'UTILITY RD' and contains several labeled areas: 8291, 4220, 347, 4071, 2305, 1419, 1583, 1434, 164, 0, 1598, 3181, 2305, 2440, 4745, and NOBEL. The map also shows a network of roads and various labeled areas.

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

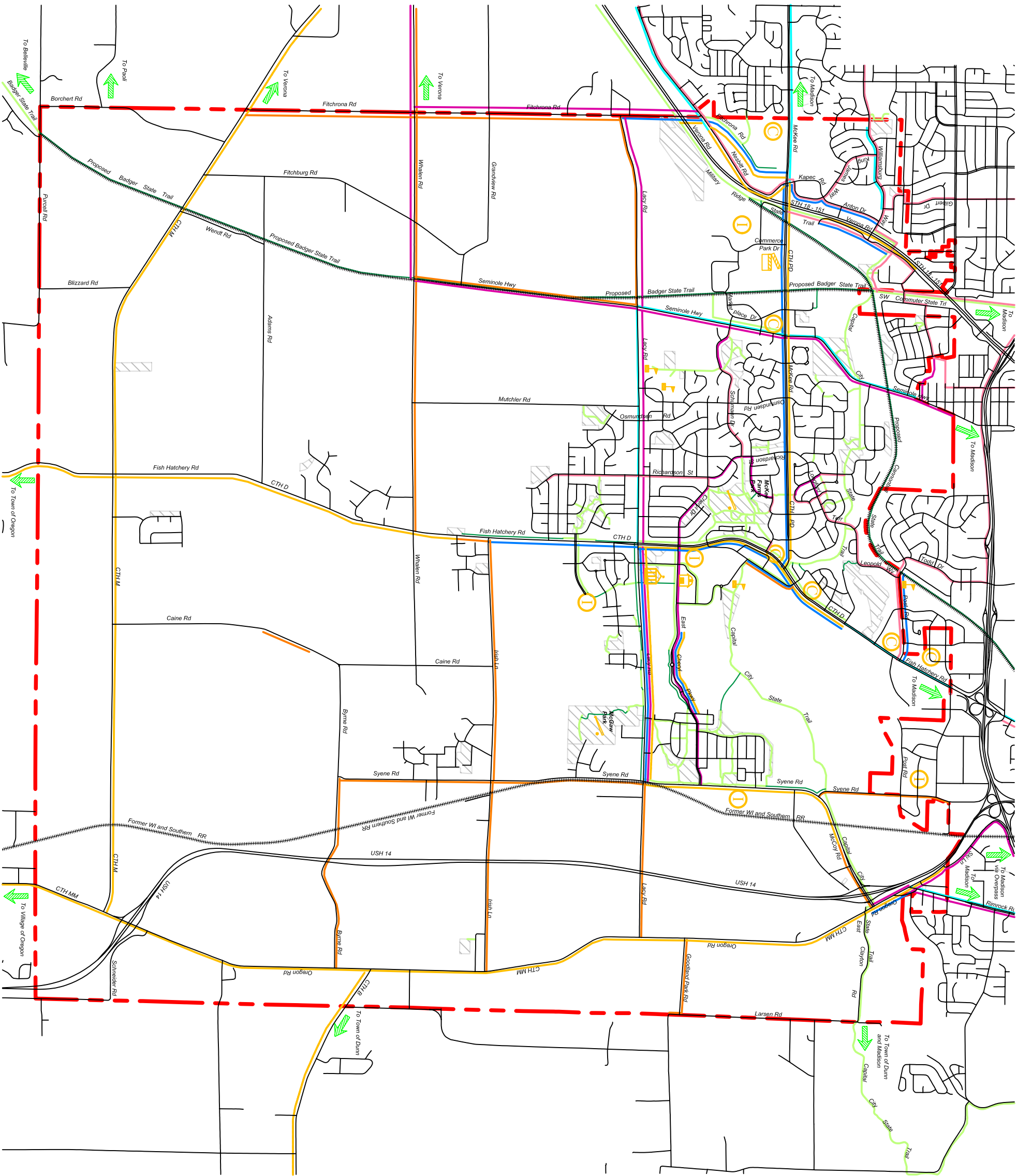
City of Fitchburg

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



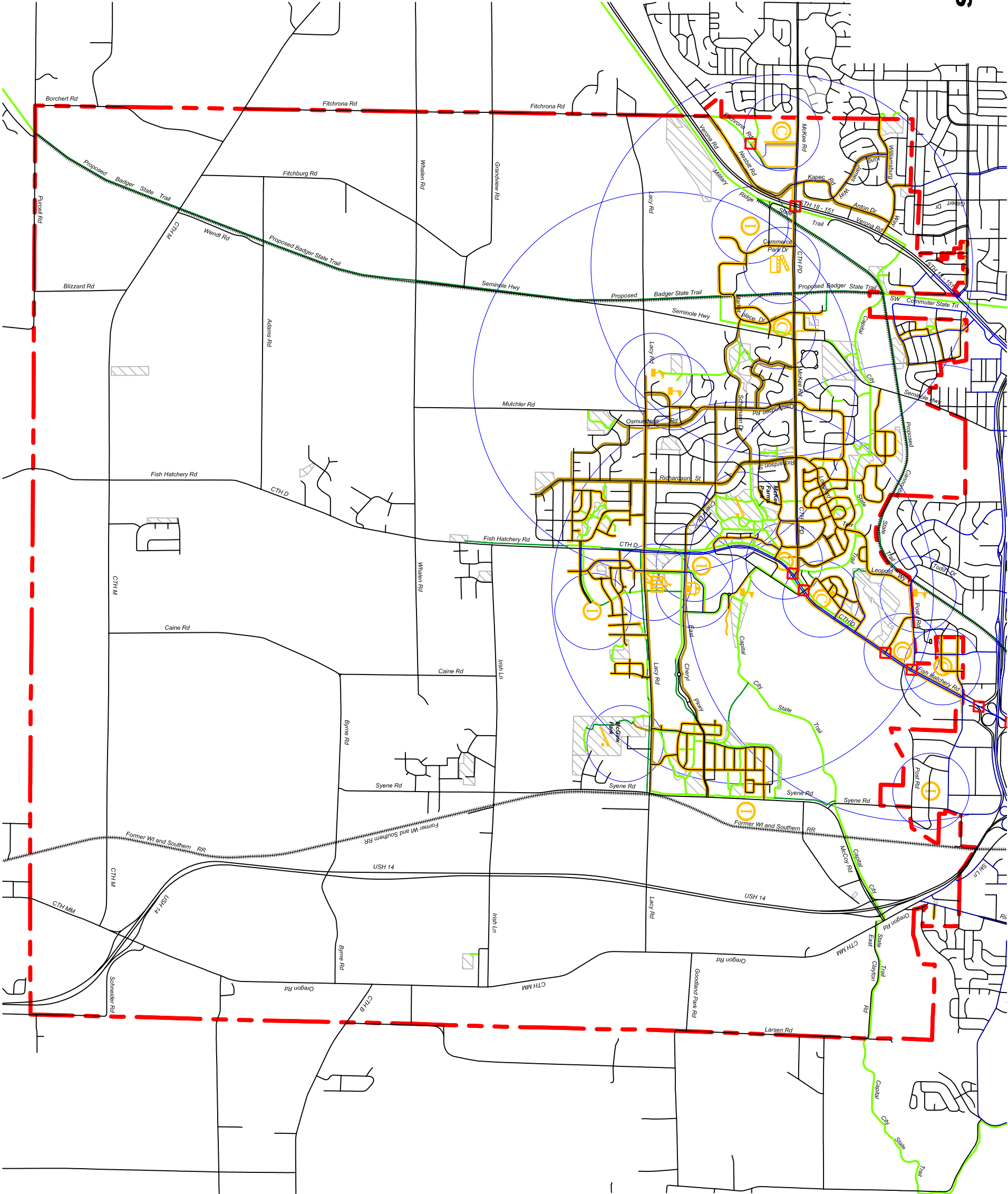
Draft Pedestrian Recommendations

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

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)	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%	3%	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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

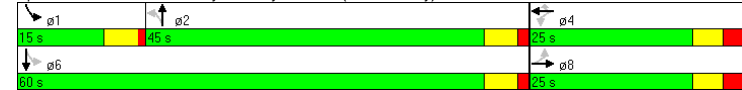
30th %ile Actuated Cycle: 71.4

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)

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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			
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	139			283				621	610	280	644	610			
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.3	6.7			
tC, 2 stage (s)															
tF (s)	2.2			2.2				3.5	4.0	3.3	3.7	4.2			
p0 queue free %	94			99				98	94	96	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														

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Synchro 7 - Report

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		
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	

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Synchro 7 - Report

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

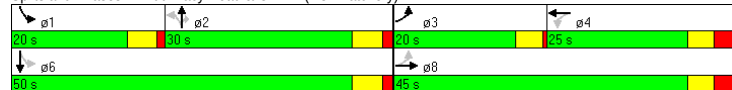
30th %ile Actuated Cycle: 78.7

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)



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Synchro 7 - Report

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	
Fltpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Fltpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	1.00	1.00	
Flrt	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

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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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 #						
Volume Total	EB 1	WB 1	NB 1			
	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

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)	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%	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)	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	

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Synchro 7 - Report

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

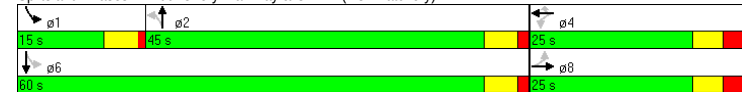
70th %ile Actuated Cycle: 55.8

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	
Flt pb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flt pb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flt		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												
Flt		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												
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

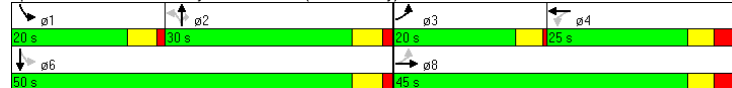
30th %ile Actuated Cycle: 69.7

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)



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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	
Fltpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Fltpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	
Flrt	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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		5
Lane Width (ft)	12.0			12.0			12.0			12.0		12.0
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		4.0
Percent Blockage	0			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

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)	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	

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Synchro 7 - Report

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.

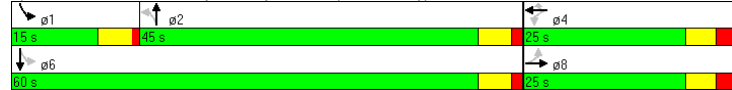
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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								F		
HCM Volume to Capacity ratio		1.83										
Actuated Cycle Length (s)		82.7						11.0				
Intersection Capacity Utilization		106.8%								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

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Synchro 7 - Report

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

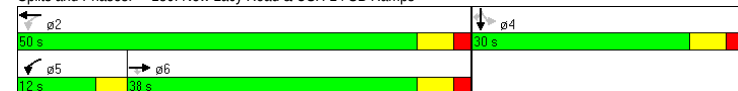
~ Volume exceeds capacity, queue is theoretically infinite.

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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Synchro 7 - Report

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

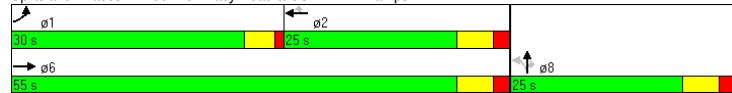
Control Type: Actuated-Coordinated

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

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)	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	

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Synchro 7 - Report

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.

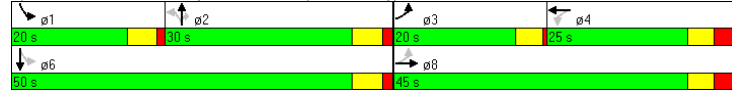
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Synchro 7 - Report

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)	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				
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											

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)	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	

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Synchro 7 - Report

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.

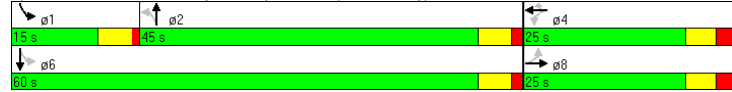
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

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	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	25.0	25.0	25.0
Total Split (%)		0.0%	53.8%	53.8%	15.0%	68.8%	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
Total Lost Time (s)		4.0	6.0	6.0	3.5	6.0	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

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Synchro 7 - Report

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

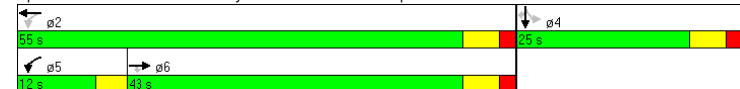
~ Volume exceeds capacity, queue is theoretically infinite.

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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Synchro 7 - Report

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
Flt		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												
Flt					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

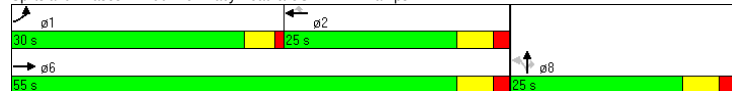
Control Type: Actuated-Coordinated

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

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)	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	

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Synchro 7 - Report

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.

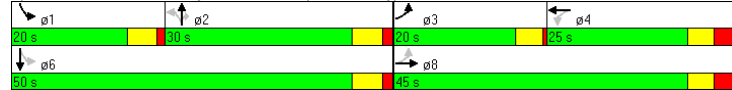
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Synchro 7 - Report

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)	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	Free	Stop	Stop	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			0.995	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

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)	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	

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Synchro 7 - Report

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.

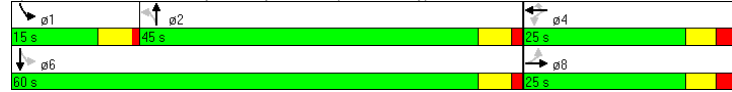
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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					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

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	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	30.0	30.0	30.0
Total Split (%)		0.0%	47.5%	47.5%	15.0%	62.5%	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
Total Lost Time (s)		4.0	6.0	6.0	3.5	6.0	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

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Synchro 7 - Report

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
Time To Reduce (s)		0.0	0.0	0.0	0.0						0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min						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
90th %ile Term Code		Coord	Coord	Max	Coord						Max	Max
70th %ile Green (s)		32.0	32.0	8.5	44.0						24.0	24.0
70th %ile Term Code		Coord	Coord	Max	Coord						Max	Max
50th %ile Green (s)		32.0	32.0	8.5	44.0						24.0	24.0
50th %ile Term Code		Coord	Coord	Max	Coord						Max	Max
30th %ile Green (s)		29.8	29.8	7.8	41.1						26.9	26.9
30th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
10th %ile Green (s)		27.5	27.5	6.3	37.3						30.7	30.7
10th %ile Term Code		Coord	Coord	Gap	Coord						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

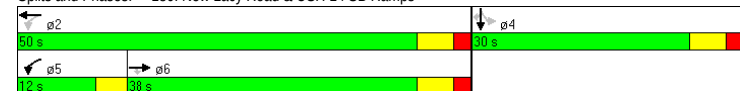
~ Volume exceeds capacity, queue is theoretically infinite.

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.

Synchro 7 - Report

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	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

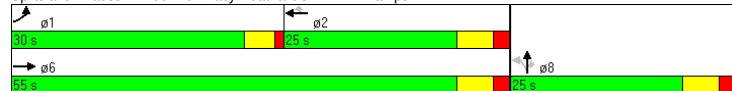
Control Type: Actuated-Coordinated

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

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)	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%
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	

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Synchro 7 - Report

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.

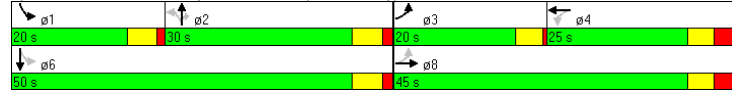
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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									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	Free	Stop	Stop	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 #												
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				

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

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	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	

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Synchro 7 - Report

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.

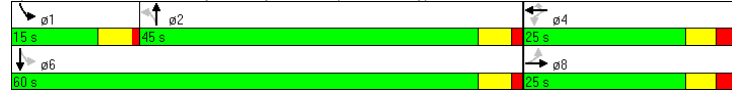
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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						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

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Synchro 7 - Report

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

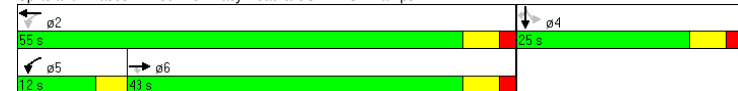
Control Type: Actuated-Coordinated

* 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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Synchro 7 - Report

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

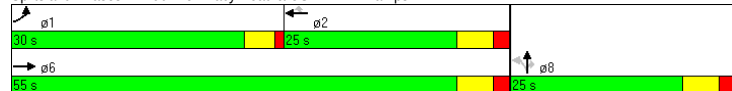
Control Type: Actuated-Coordinated

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

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

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)	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	

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Synchro 7 - Report

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.

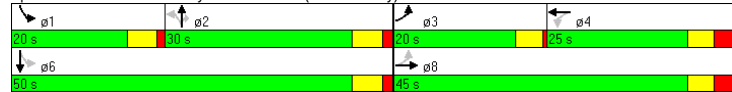
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Synchro 7 - Report

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)	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

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)	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	

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Synchro 7 - Report

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.

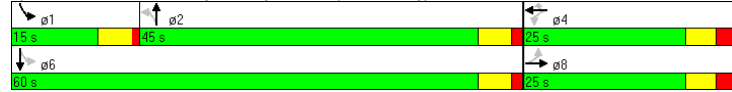
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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								F		
HCM Volume to Capacity ratio		1.76										
Actuated Cycle Length (s)		82.7						11.0				
Intersection Capacity Utilization		104.7%								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

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Synchro 7 - Report

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
Time To Reduce (s)		0.0	0.0	0.0	0.0						0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min						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
90th %ile Term Code		Coord	Coord	Max	Coord						Max	Max
70th %ile Green (s)		38.1	38.1	7.4	49.0						19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
50th %ile Green (s)		36.8	36.8	6.8	47.1						20.9	20.9
50th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
30th %ile Green (s)		33.0	33.0	6.2	42.7						25.3	25.3
30th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
10th %ile Green (s)		35.3	35.3	0.0	35.3						32.7	32.7
10th %ile Term Code		Coord	Coord	Skip	Coord						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.

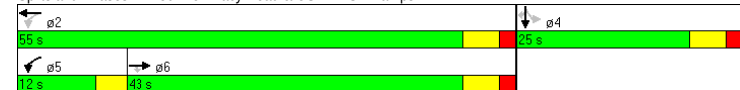
Queue shown is maximum after two cycles.

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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Synchro 7 - Report

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

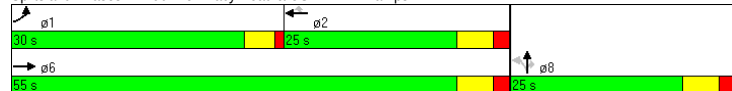
Control Type: Actuated-Coordinated

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

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)	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	

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Synchro 7 - Report

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.

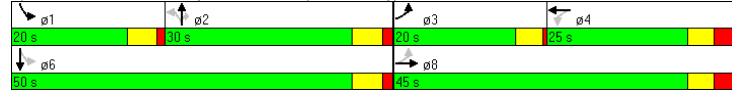
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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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			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	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												0.850
Frt		0.975			0.986			0.984				
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%											
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		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		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		

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)	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	

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Synchro 7 - Report

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.

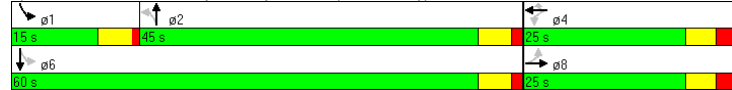
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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											

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	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

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Synchro 7 - Report

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
Time To Reduce (s)		0.0	0.0	0.0	0.0						0.0	0.0
Recall Mode		C-Min	C-Min	None	C-Min						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
90th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
70th %ile Green (s)		39.0	39.0	6.5	49.0						19.0	19.0
70th %ile Term Code		Coord	Coord	Gap	Coord						Max	Max
50th %ile Green (s)		39.5	39.5	6.0	49.0						19.0	19.0
50th %ile Term Code		Coord	Coord	Min	Coord						Max	Max
30th %ile Green (s)		39.5	39.5	6.0	49.0						19.0	19.0
30th %ile Term Code		Coord	Coord	Min	Coord						Max	Max
10th %ile Green (s)		49.0	49.0	0.0	49.0						19.0	19.0
10th %ile Term Code		Coord	Coord	Skip	Coord						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

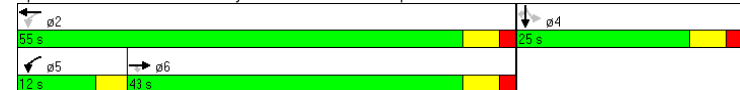
~ Volume exceeds capacity, queue is theoretically infinite.

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

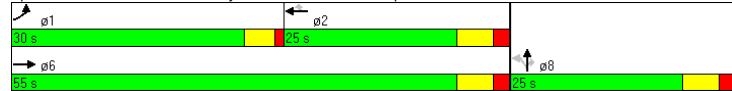
Control Type: Actuated-Coordinated

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

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)	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%
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	

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Synchro 7 - Report

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.

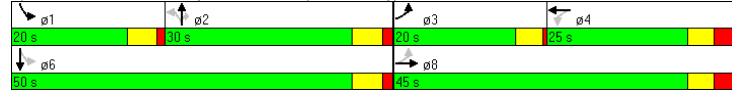
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Synchro 7 - Report

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			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	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		12.0
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		4.0
Percent Blockage	0			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.                27
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   90.00   90.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1532   1045   1207
* AVE DELAY mins    0.05   0.23   0.40
* MAX DELAY mins    0.07   0.37   0.74
* AVE QUEUE  veh      0      3      7
* MAX QUEUE  veh      0      4     12
*
* AVEDEL s    16.5
* LOS SIG     B
* LOS UNSIG   C
*
* VEHIC HRS   10.2
* COST $      153
*
*****

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```

*****
*
*   9:1:09                2025 BUILD - CHERYL/NEW LACY-NO IMP.                28
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   90.00   90.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1856   844   1200
* AVE DELAY mins    0.05   3.97   0.10
* MAX DELAY mins    0.08   8.04   0.13
* AVE QUEUE  veh      1      74     1
* MAX QUEUE  veh      1     117     1
*
* AVEDEL s    98.8
* LOS SIG     F
* LOS UNSIG   F
*
* VEHIC HRS   62.8
* COST $      942
*
*****

```

APPENDIX C

Year 2035 Build Traffic Peak Hour Analysis

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)	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	

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Synchro 7 - Report

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.

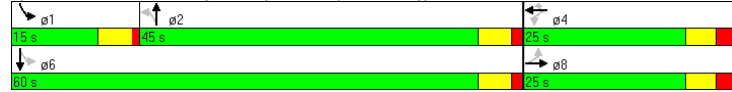
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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							F			
HCM Volume to Capacity ratio		1.97										
Actuated Cycle Length (s)		83.9						11.0				
Intersection Capacity Utilization		109.6%							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

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Synchro 7 - Report

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.

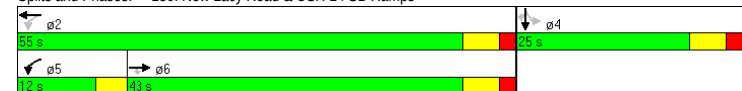
Queue shown is maximum after two cycles.

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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Synchro 7 - Report

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

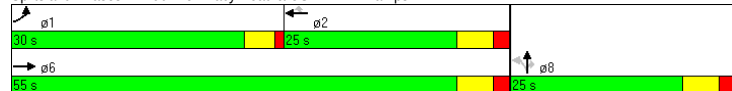
Control Type: Actuated-Coordinated

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

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)	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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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.

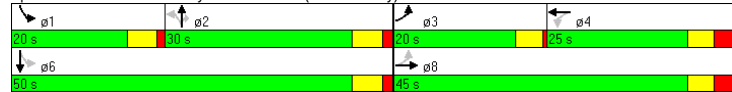
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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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									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			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	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												0.850
Frt		0.971			0.983			0.985				0.988
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		

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	

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Synchro 7 - Report

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.

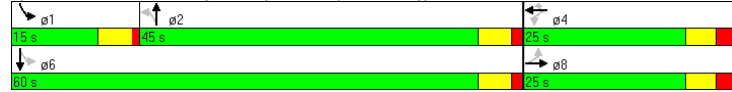
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Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

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	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

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Synchro 7 - Report

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

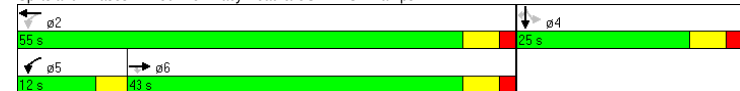
Control Type: Actuated-Coordinated

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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Synchro 7 - Report

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

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)	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%
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	

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Synchro 7 - Report

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.

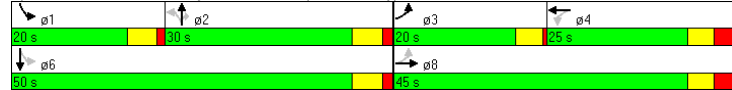
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Synchro 7 - Report

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)	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			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	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		5
Lane Width (ft)	12.0			12.0			12.0			12.0		12.0
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		4.0
Percent Blockage	0			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			

Volume
550: Irish Lane & East Hill

2/5/2009

	→	↘	↙	←	↖	↗
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

2/5/2009

	→	↘	↙	←	↖	↗
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 #						
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.                45
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   80.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1367    808    994
* AVE DELAY mins    0.07    2.71    4.59
* MAX DELAY mins    0.09    5.38    9.60
* AVE QUEUE  veh      1      44     107
* MAX QUEUE  veh      1      73     165
*
* AVEDEL s 180.9
* LOS SIG F
* LOS UNSIG F
*
* VEHIC HRS 125.6
* COST $ 1884
*
*****

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*****
*
*   9:1:09                2035 BUILD - CHERYL/NEW LACY-NO IMP.                46
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   80.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1603    559   1001
* AVE DELAY mins    0.09   16.17    0.18
* MAX DELAY mins    0.14   30.34    0.27
* AVE QUEUE  veh      2     348      2
* MAX QUEUE  veh      2     537      3
*
* AVEDEL s 388.4
* LOS SIG F
* LOS UNSIG F
*
* VEHIC HRS 289.1
* COST $ 4337
*
*****

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*****
*
* 9:1:09                2035 BUILD - CHERYL/NEW LACY-NO IMP.                47
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   80.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1455     1005     1189
* AVE DELAY mins     0.06     0.42     1.25
* MAX DELAY mins     0.09     0.78     2.60
* AVE QUEUE  veh        1        6        26
* MAX QUEUE  veh        1        10       51
*
* AVEDEL s      43.6
* LOS SIG      D
* LOS UNSIG    E
*
* VEHIC HRS    30.3
* COST $       455
*
*****

```

```

*****
*
* 9:1:09                2035 BUILD - CHERYL/NEW LACY-NO IMP.                48
*
*****
*
* E      (m)    7.92    4.27    4.27
* L'     (m)   40.00   80.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1800     756     1190
* AVE DELAY mins     0.07     9.11     0.11
* MAX DELAY mins     0.10    18.88     0.16
* AVE QUEUE  veh        1      199        1
* MAX QUEUE  veh        1     314        2
*
* AVEDEL s     219.5
* LOS SIG      F
* LOS UNSIG    F
*
* VEHIC HRS    163.4
* COST $      2451
*
*****

```

APPENDIX D

BACKGROUND TRAFFIC PEAK HOUR ANALYSIS OUTPUTS *WITH IMPROVEMENTS*

APPENDIX D

Year 2008 Existing Traffic Peak Hour Analysis Outputs *With Improvements*

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)	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%	3%	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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

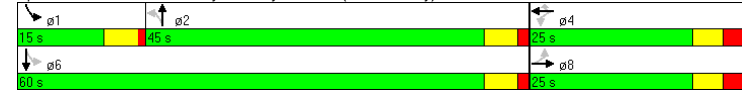
30th %ile Actuated Cycle: 71.4

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)



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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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			
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	139			283			621		610	280	644	610			
tC, single (s)	4.1			4.1			7.1		6.5	6.2	7.3	6.7			
tC, 2 stage (s)															
tF (s)	2.2			2.2			3.5		4.0	3.3	3.7	4.2			
p0 queue free %	94			99			98		94	96	98	98			
cM capacity (veh/h)	1438			1257			359		376	749	312	358			
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														

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Synchro 7 - Report

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	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%				
Storage Length (ft)	130			0	155			0	100			175	150
Storage Lanes	1			0	1			0	1			1	1
Taper Length (ft)	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	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			
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
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	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%	4%
Bus Blockages (#/hr)	0	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				pm+pt	
Protected Phases	3	8			4				2				1
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	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	4.0
Lead/Lag	Lead			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

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Synchro 7 - Report

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

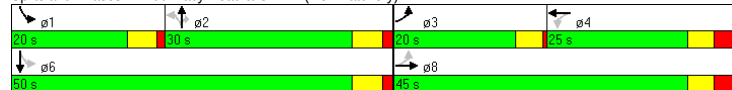
30th %ile Actuated Cycle: 78.7

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)



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Synchro 7 - Report

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		
Flrb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99		
Flrb, 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	0.85
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	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	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%	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

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Synchro 7 - Report

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		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		5
Lane Width (ft)	12.0			12.0			12.0			12.0		12.0
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		4.0
Percent Blockage	0			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 #												
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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 #						
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

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)	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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

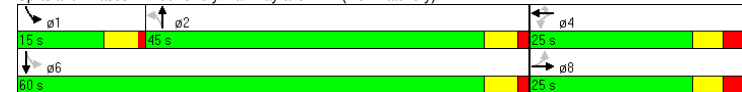
70th %ile Actuated Cycle: 55.8

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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Synchro 7 - Report

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

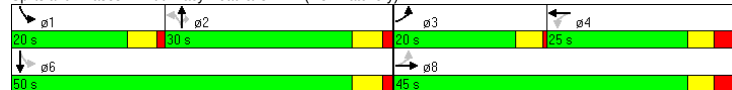
30th %ile Actuated Cycle: 69.7

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)



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Synchro 7 - Report

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	
Fltpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.99	
Flpfb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flt	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

Volume
210: Lacy Road & Research Park Drive

2/5/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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 #						
Volume Total	EB 1	WB 1	NB 1			
	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		5
Lane Width (ft)	12.0			12.0			12.0			12.0		12.0
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		4.0
Percent Blockage	0			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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

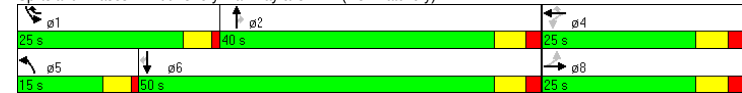
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis

100: Cheryl Parkway & CTH D (Fish Hatchery)

1/7/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	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	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	1.00
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	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	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1703	1638	1704	1810	1528	1719	3438	1514	3335	3438	1501	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	1.00
Satd. Flow (perm)	1351	1638	1299	1810	1528	1719	3438	1514	3335	3438	1501	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		21.0	56.2
Effective Green, g (s)	14.1	14.1		14.1	14.1	35.1		3.2	38.4		21.0	56.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.39		0.04	0.43		0.23	0.62
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5		4.5	6.0		4.5	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	5.0		2.0	5.0
Lane Grp Cap (vph)	212	257		204	284	596		61	1467		778	2147
v/s Ratio Prot		0.03			0.00	0.07		0.01	0.40		0.20	0.15
v/s Ratio Perm	0.11			0.08		0.04			0.10			0.01
v/c Ratio	0.68	0.19		0.49	0.02	0.28		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		33.1	7.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.96	0.76		0.89	1.00
Incremental Delay, d2	6.6	0.1		0.7	0.0	0.1		0.6	10.6		8.9	0.3
Delay (s)	42.5	33.1		35.3	32.1	18.9		41.3	29.4		42.0	7.8
Level of Service	D	C		D	C	B		D	C		B	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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

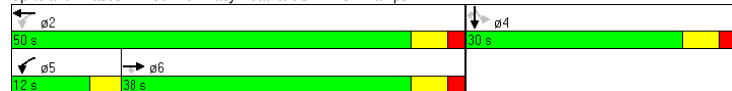
Control Type: Actuated-Coordinated

* 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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

HCM Volume to Capacity ratio

Actuated Cycle Length (s)

Intersection Capacity Utilization

Analysis Period (min)

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			

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Synchro 7 - Report

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

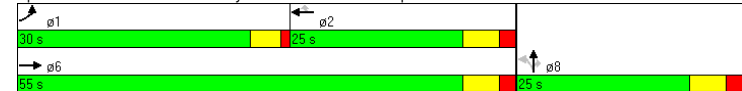
Natural Cycle: 60

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.

Synchro 7 - Report

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:NBT and 6:SBTL, Start of Green

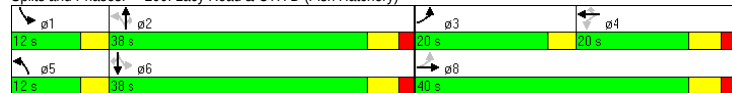
Natural Cycle: 70

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
Flt pb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flt pb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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
Growth Factor (vph)	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
RTOR Reduction (vph)	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
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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

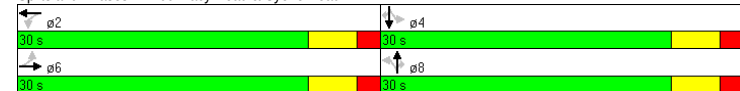
70th %ile Actuated Cycle: 58

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.

Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis

260: Lacy Road & Syene Road

1/7/2009

	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
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	0.95	1.00	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

	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		150		100		150	
Storage Lanes	0		1		0		1		1		1	
Taper Length (ft)	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	534	1700	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	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

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	↰	↱	↕	↱	↰	↕
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			
Frt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Frt 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	
Frt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Frt 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			

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)	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

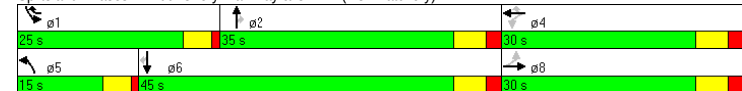
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		90.0						10.5				
Intersection Capacity Utilization		75.5%										
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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

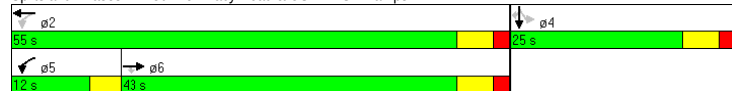
Control Type: Actuated-Coordinated

* 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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

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)	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			

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

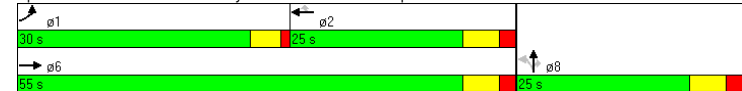
Natural Cycle: 60

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.

Synchro 7 - Report

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
Flt pb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flt pb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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%
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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

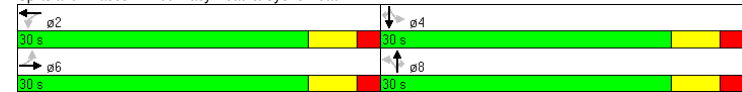
30th %ile Actuated Cycle: 42.1

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.

Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis

260: Lacy Road & Syene Road

1/7/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flt Permitted	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
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	
Protected Phases	6			2			8		8		4	
Permitted Phases	6			2			8		8		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

	EBL	EBT	WBT	WBR	SBL	SBR
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

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	↰	↱	↕	↕	↰	↱
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			
Frt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Frt 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	
Frt Protected				0.995	0.993	
Satd. Flow (prot)	1800	0	0	1800	1588	0
Frt 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
*
*****

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*****
*
* 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
*
*****

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*****
*
* 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 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
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1207     1081     1215
* AVE DELAY mins    0.06    0.06    0.07
* MAX DELAY mins    0.08    0.07    0.09
* AVE QUEUE  veh      0      0      0
* MAX QUEUE  veh      0      0      0
*
* AVEDEL s      3.9
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS    0.7
* COST $       11
*
*****

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*****
*
* 9:1:09                2025 BACK - LACY/FAHEY GLEN                16
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1207     1023     1215
* AVE DELAY mins    0.07    0.06    0.07
* MAX DELAY mins    0.09    0.08    0.09
* AVE QUEUE  veh      0      0      0
* MAX QUEUE  veh      1      0      0
*
* AVEDEL s      4.1
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS    0.8
* 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
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1696    820    1653
* AVE DELAY mins    0.05    0.25    0.17
* MAX DELAY mins    0.06    0.39    0.27
* AVE QUEUE  veh      0      2      4
* MAX QUEUE  veh      0      3      5
*
* AVEDEL s      9.8
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS    6.2
* COST $      92
*
*****

```

```

*****
*
*   9:1:09                2025 BACK - CHERYL/NEW LACY                20
*
*****
*
* E      (m)    7.92    4.27    7.31
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1849    634    1657
* AVE DELAY mins    0.05    0.32    0.08
* MAX DELAY mins    0.07    0.53    0.11
* AVE QUEUE  veh      1      2      1
* MAX QUEUE  veh      1      3      1
*
* AVEDEL s      7.1
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS    4.1
* COST $      61
*
*****

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```

*****
*
*   9:1:09                2025 BACK - CHERYL/NEW LACY                21
*
*****
*
* E      (m)    7.92    4.27    7.31
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1893   1017   1851
* AVE DELAY mins    0.04   0.13   0.11
* MAX DELAY mins    0.05   0.19   0.16
* AVE QUEUE  veh      0      1      2
* MAX QUEUE  veh      0      2      3
*
* AVEDEL s      6.0
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     3.8
* COST $        56
*
*****

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```

*****
*
*   9:1:09                2025 BACK - CHERYL/NEW LACY                22
*
*****
*
* E      (m)    7.92    4.27    7.31
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     2046    832   1854
* AVE DELAY mins    0.05   0.15   0.06
* MAX DELAY mins    0.06   0.22   0.08
* AVE QUEUE  veh      1      1      1
* MAX QUEUE  veh      1      1      1
*
* AVEDEL s      4.4
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     2.5
* 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
*
*****

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```

*****
*
*      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
*
*****

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*****
*
*      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
*
*****

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```

*****
*
*      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*

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)	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

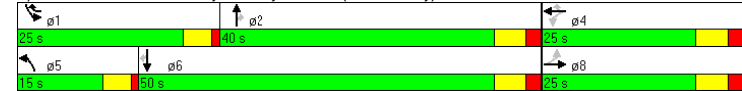
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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
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

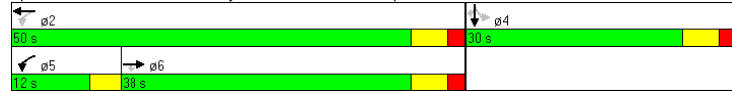
Control Type: Actuated-Coordinated

* 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

HCM Volume to Capacity ratio

Actuated Cycle Length (s)

Intersection Capacity Utilization

Analysis Period (min)

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)	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			

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Synchro 7 - Report

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

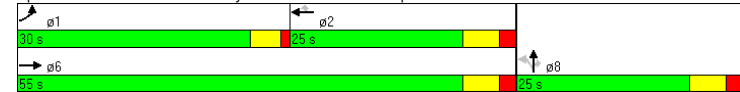
Natural Cycle: 60

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	0.24	0.22			0.16							
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)

↖ ϕ1	↖ ϕ2	↖ ϕ3	↖ ϕ4
12 s	38 s	18 s	22 s
↖ ϕ5	↖ ϕ6	↖ ϕ7	↖ ϕ8
12 s	38 s	40 s	

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
Flt	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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
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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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
Flpb, 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	
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	Free	Stop	Stop	Stop
Grade	0%	0%	0%	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	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	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	
Frt Protected	0.960			0.971		0.950			0.950			
Satd. Flow (prot)	0	1737	1538	0	1757	1538	1719	3438	1538	1719	3438	1538
Frt 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	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

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	↰	↱	↕	↱	↰	↕
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			
Frt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Frt 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	
Frt Protected					0.981	
Satd. Flow (prot)	1808	0	0	1810	1630	0
Frt 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			

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)	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

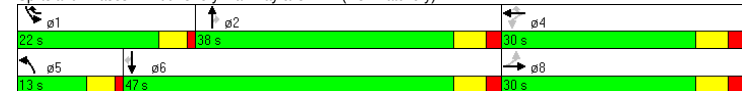
Control Type: Actuated-Coordinated

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.

Synchro 7 - Report

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		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
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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

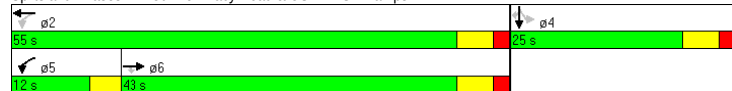
Control Type: Actuated-Coordinated

* 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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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			

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Synchro 7 - Report

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

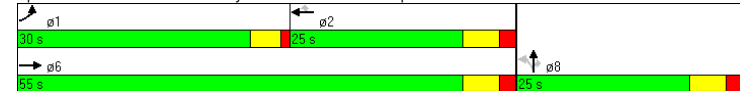
Natural Cycle: 65

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

	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:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

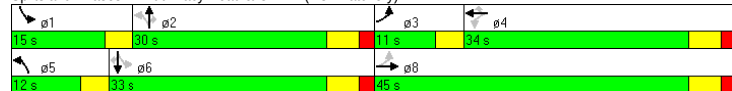
Control Type: Actuated-Coordinated

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

	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
Fltpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Fltpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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
Growth Factor (vph)	100%	100%		100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	139	233		133	194	506	78	378	39	289	956	175
RTOR Reduction (vph)	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
Confl. Peds. (#/hr)	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				

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	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%
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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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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Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis

260: Lacy Road & Syene Road

1/7/2009

	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
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flt Permitted	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99
Satd. Flow (prot)	1714	1773		1718	1767		1714	1810	1496	1707	1810	1496
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	
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

	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	Free	Stop	Stop	Stop
Grade	0%	0%	0%	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	5	5	5
Lane Width (ft)	12.0	12.0	12.0	12.0	12.0	12.0
Walking Speed (ft/s)	4.0	4.0	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	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	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	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%	0%	0%	0%	0%	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
Frt Protected	0.954				0.958		0.950			0.950		
Satd. Flow (prot)	0	1726	1538	0	1734	1538	1719	3438	1538	1719	3438	1538
Frt 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				
Median storage (veh)									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			
Frt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1538	3438	1538	1719	3438
Frt 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	
Frt Protected				0.994	0.996	
Satd. Flow (prot)	1797	0	0	1799	1579	0
Frt 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 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	*	

```

*****
*
*   9:1:09                2035 BACK - LACY/FAHEY GLEN                16
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1218   1045   1221
* AVE DELAY mins    0.07   0.06   0.08
* MAX DELAY mins    0.09   0.07   0.10
* AVE QUEUE  veh      0      0      1
* MAX QUEUE  veh      0      0      1
*
* AVEDEL s      4.4
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     1.0
* COST $        15
*
*****

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*****
*
*   9:1:09                2035 BACK - LACY/FAHEY GLEN                17
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1218    972   1221
* AVE DELAY mins    0.08   0.06   0.08
* MAX DELAY mins    0.10   0.08   0.10
* AVE QUEUE  veh      1      0      1
* MAX QUEUE  veh      1      0      1
*
* AVEDEL s      4.6
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     1.2
* COST $        17
*
*****

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*****
*
*      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
*
*****

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*****
*
*      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
*
*****

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*****
*
*      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
*
*****

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*****
*
*      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
*
*****

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*****
*
*      9:1:09                2035 BACK - CHERYL/NEW LACY                26
*
*****
*
* E      (m)      7.92      4.27      7.31
* L'     (m)     40.00     40.00     40.00
* V      (m)      7.31      3.65      3.65
* RAD    (m)     25.00     20.00     20.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP          0          0          0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1700      770      1640
* AVE DELAY mins    0.05    0.31    0.38
* MAX DELAY mins    0.07    0.52    0.73
* AVE QUEUE  veh      0        3        9
* MAX QUEUE  veh      1        4       16
*
* AVEDEL s      17.6
* LOS SIG      B
* LOS UNSIG    C
*
* VEHIC HRS     12.4
* COST $       185
*
*****

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*****
*
*      9:1:09                2035 BACK - CHERYL/NEW LACY                27
*
*****
*
* E      (m)      7.92      4.27      7.31
* L'     (m)     40.00     40.00     40.00
* V      (m)      7.31      3.65      3.65
* RAD    (m)     25.00     20.00     20.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP          0          0          0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1849      544      1647
* AVE DELAY mins    0.07    0.87    0.09
* MAX DELAY mins    0.09    1.74    0.12
* AVE QUEUE  veh      1        7        1
* MAX QUEUE  veh      1       13        2
*
* AVEDEL s      13.5
* LOS SIG      B
* LOS UNSIG    B
*
* VEHIC HRS      8.8
* COST $       132
*
*****

```

```

*****
*
*   9:1:09                2035 BACK - CHERYL/NEW LACY                28
*
*****
*
* E      (m)    7.92    4.27    7.31
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1897    967    1837
* AVE DELAY mins    0.04    0.15    0.16
* MAX DELAY mins    0.06    0.22    0.27
* AVE QUEUE  veh      0      1      4
* MAX QUEUE  veh      0      2      6
*
* AVEDEL s      8.0
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     5.6
* COST $       85
*
*****

```

```

*****
*
*   9:1:09                2035 BACK - CHERYL/NEW LACY                29
*
*****
*
* E      (m)    7.92    4.27    7.31
* L'     (m)   40.00   40.00   40.00
* V      (m)    7.31    3.65    3.65
* RAD    (m)   25.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     2046    742    1844
* AVE DELAY mins    0.05    0.21    0.07
* MAX DELAY mins    0.07    0.34    0.09
* AVE QUEUE  veh      1      2      1
* MAX QUEUE  veh      1      2      1
*
* AVEDEL s      5.3
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     3.5
* 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
*
*****

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```

*****
*
* 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 *
*
*****

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```

*****
*
* 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
*
*****

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```

*****
*
*      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
*
*****

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```

*****
*
*      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
*
*****

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*****
*
*      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*

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	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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

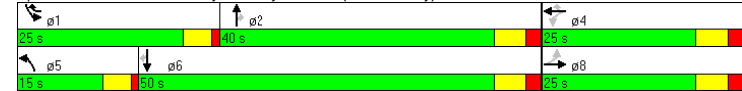
Control Type: Actuated-Coordinated

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.

Synchro 7 - Report

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
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

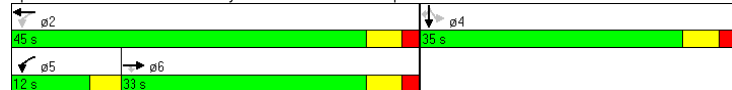
* User Entered Value

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

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			

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

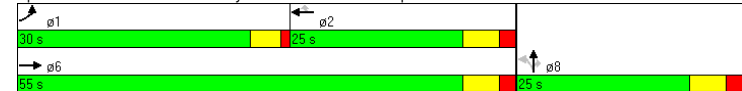
Natural Cycle: 60

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.

Synchro 7 - Report

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		0.850	
Flt Protected	0.950			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			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)

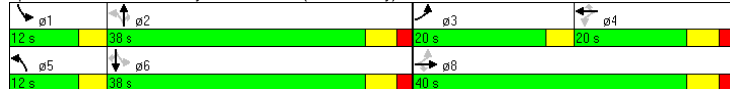
1/7/2009

	↖	→	↗	↙	←	↖	↙	↑	↗	↘	↓	↘
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
Fltpb, 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
Flpfb, 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
Flt	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	0.95	1.00	0.95	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			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	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			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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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.

Synchro 7 - Report

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

1/7/2009

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.

[illegible]

1/7/2009

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		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		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

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	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	

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Synchro 7 - Report

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

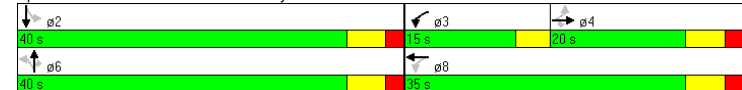
70th %ile Actuated Cycle: 71.1

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	
Flt Protected	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flt Permitted	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1703	1810	1486	1714	1808		1712	1810	1499	1715	1698	
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	
Frt Protected					0.987	
Satd. Flow (prot)	1808	0	0	1810	1607	0
Frt 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				

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)	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
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

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Synchro 7 - Report

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

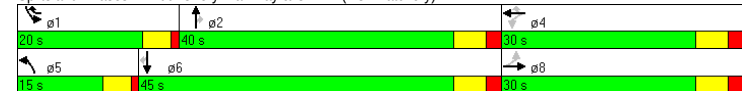
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		90.0						10.5				
Intersection Capacity Utilization		74.7%										
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
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
Flt		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			

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Synchro 7 - Report

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

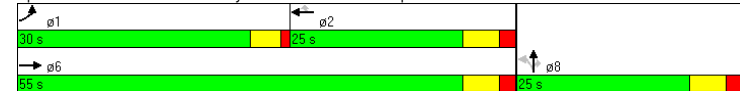
Natural Cycle: 70

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.

Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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:NBT 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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Fltpb, 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
Fltpb, 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
Flt	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	0.95	1.00	0.95	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			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	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

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	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		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%
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

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Synchro 7 - Report

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
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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Synchro 7 - Report

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	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	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	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	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	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:NBT and 6:SBTL, Start of Green

Natural Cycle: 55

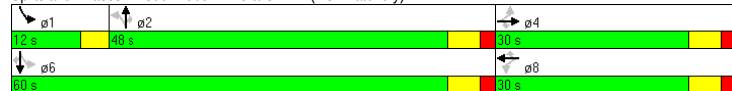
Control Type: Actuated-Coordinated

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	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	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	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	1.00
Frt	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	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	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
Growth Factor (vph)	100%	100%		50%	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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

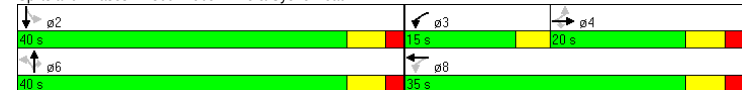
30th %ile Actuated Cycle: 59.5

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
Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	
Flt Protected	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	
Flt Permitted	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Satd. Flow (prot)	1700	1810	1487	1716	1807		1715	1810	1498	1710	1794	
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	
Frt Protected				0.995	0.993	
Satd. Flow (prot)	1802	0	0	1800	1588	0
Frt 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			

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*****
*
* 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
*
*****

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*****
*
* 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
*
*****

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*****
*
*      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
*
*****

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*****
*
* 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
*
*****

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```

*****
*
* 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
* L'     (m)     40.00     40.00     90.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0         0         0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1334     1462     2077
* AVE DELAY mins      0.07      0.09      0.22
* MAX DELAY mins      0.09      0.12      0.40
* AVE QUEUE  veh        0         1         7
* MAX QUEUE  veh        1         1        11
*
*
*****

```

```

*****
*
*      9:1:09                2025 BUILD - CHERYL/NEW LACY                25
*
*****
*
* E      (m)      7.92      7.31      7.92
* L'     (m)     40.00     40.00     90.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0         0         0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1658     1209     2062
* AVE DELAY mins      0.07      0.26      0.06
* MAX DELAY mins      0.10      0.46      0.08
* AVE QUEUE  veh        1         4         1
* MAX QUEUE  veh        1         6         1
*
*
*****

```

```

*****
*
*      9:1:09                2025 BUILD - CHERYL/NEW LACY                26
*
*****
*
* E      (m)      7.92      7.31      7.92
* L'     (m)     40.00     40.00     90.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1531     1659     2274
* AVE DELAY mins      0.05      0.07      0.12
* MAX DELAY mins      0.07      0.09      0.20
* AVE QUEUE  veh        0        1        4
* MAX QUEUE  veh        0        1        5
*
* AVEDEL s      5.9
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     4.8
* COST $        72
*
*****

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```

*****
*
*      9:1:09                2025 BUILD - CHERYL/NEW LACY                27
*
*****
*
* E      (m)      7.92      7.31      7.92
* L'     (m)     40.00     40.00     90.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1855     1407     2259
* AVE DELAY mins      0.05      0.13      0.05
* MAX DELAY mins      0.08      0.21      0.07
* AVE QUEUE  veh        1        2        1
* MAX QUEUE  veh        1        3        1
*
* AVEDEL s      4.7
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     3.6
* COST $        55
*
*****

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```

*****
*
*   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
*
*****

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```

*****
*
*   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
*
*****

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```

*****
*
*      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
*
*****

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*****
*
*      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
*
*****

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```

*****
*
*      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
*
*****

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```

*****
*
*      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
*
*****

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```

*****
*
*      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
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1010     625  1026
* AVE DELAY mins    0.23    0.10  0.09
* MAX DELAY mins    0.36    0.13  0.12
* AVE QUEUE  veh      3      0      1
* MAX QUEUE  veh      4      0      1
*
* AVEDEL s    10.9
* LOS SIG     B
* LOS UNSIG   B
*
* VEHIC HRS   3.4
* COST $      51
*
*****

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```

*****
*
* 9:1:09                2025 BUILD - CHERYL/FAHEY                31
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1024     750  1013
* AVE DELAY mins    0.11    0.08  0.66
* MAX DELAY mins    0.15    0.11  1.30
* AVE QUEUE  veh      1      0     10
* MAX QUEUE  veh      1      0     19
*
* AVEDEL s    27.1
* LOS SIG     C
* LOS UNSIG   D
*
* VEHIC HRS   11.0
* COST $     165
*
*****

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```

*****
*
*      9:1:09                2025 BUILD - CHERYL/FAHEY                32
*
*****
*
* E      (m)      4.27      4.27      4.27
* L'     (m)     40.00     40.00     40.00
* V      (m)      3.65      3.65      3.65
* RAD    (m)     20.00     20.00     20.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     40.00     40.00     40.00
* GRAD SEP      0         0         0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1207     821    1223
* AVE DELAY mins    0.13    0.07    0.07
* MAX DELAY mins    0.18    0.09    0.09
* AVE QUEUE  veh       2       0       0
* MAX QUEUE  veh       2       0       1
*
* AVEDEL s      6.5
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     2.0
* COST $        30
*
*****

```

```

*****
*
*      9:1:09                2025 BUILD - CHERYL/FAHEY                33
*
*****
*
* E      (m)      4.27      4.27      4.27
* L'     (m)     40.00     40.00     40.00
* V      (m)      3.65      3.65      3.65
* RAD    (m)     20.00     20.00     20.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     40.00     40.00     40.00
* GRAD SEP      0         0         0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1221     947    1210
* AVE DELAY mins    0.08    0.07    0.21
* MAX DELAY mins    0.11    0.08    0.33
* AVE QUEUE  veh       1       0       3
* MAX QUEUE  veh       1       0       4
*
* AVEDEL s      9.5
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     3.8
* 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
*
*****

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```

*****
*
*   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
*
*****

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APPENDIX E

Year 2035 Build Traffic Peak Hour Analysis *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)	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

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Synchro 7 - Report

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

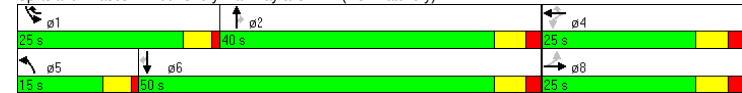
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

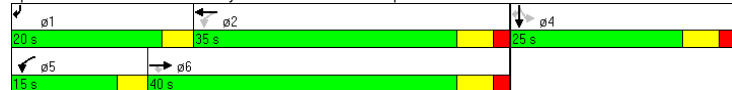
* User Entered Value

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
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			

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Synchro 7 - Report

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

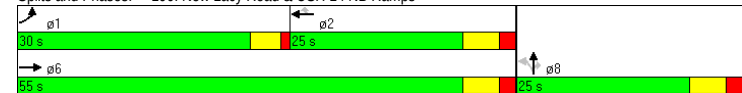
Natural Cycle: 75

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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:NBT and 6:SBTL, Start of Green

Natural Cycle: 75

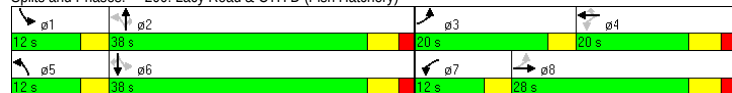
Control Type: Actuated-Coordinated

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Fltpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Fltpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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
Growth Factor (vph)	100%	100%		100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	372	478		233	50	211	125	156	950	69	178	561
RTOR Reduction (vph)	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
Confl. Peds. (#/hr)	5			5			5			5		5
Turn Type	pm+pt			pm+pt		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)	33.3	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			

Volume
220: Lacy Road & Mica Road

1/7/2009

	→	↘	↙	←	↖	↗
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

1/7/2009

						
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

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			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	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

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			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%
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

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

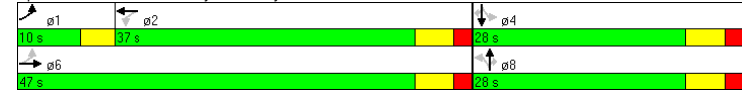
30th %ile Actuated Cycle: 68.2

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.

Synchro 7 - Report

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	
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:NBT and 6:SBTL, Start of Green

Natural Cycle: 90

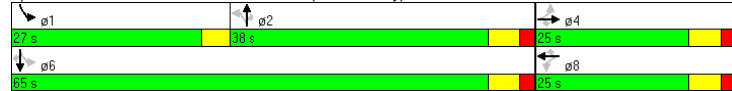
Control Type: Actuated-Coordinated

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	0.95	1.00	0.95	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		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	

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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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

↖ ø2	↙ ø3	↗ ø4
42 s	15 s	18 s
↖ ø6	↙ ø8	
42 s	33 s	

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Synchro 7 - Report

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	
Flpb, 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)

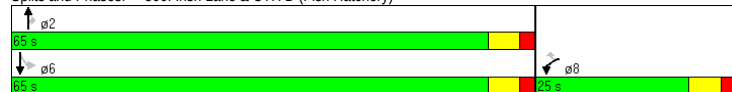
1/7/2009

	↖	↗	↑	↘	↙	↓
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
Fltpb, 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			

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)	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

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Synchro 7 - Report

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

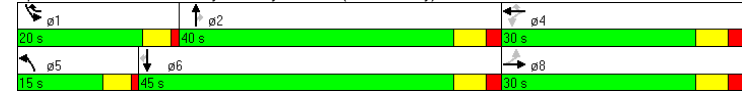
Control Type: Actuated-Coordinated

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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Traffic Analysis & Design, Inc.

Synchro 7 - Report

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		0.13	0.39	
v/s Ratio Perm	0.04			0.18		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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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			

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Synchro 7 - Report

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

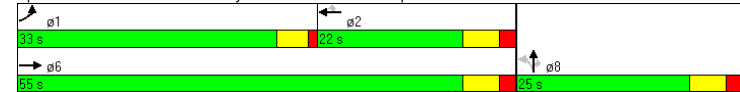
Natural Cycle: 75

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.

Synchro 7 - Report

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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:NBT 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)

ø1	ø2	ø3	ø4
18 s	36 s	12 s	24 s
ø5	ø6	ø7	ø8
18 s	36 s	12 s	24 s

HCM Signalized Intersection Capacity Analysis
200: Lacy Road & CTH D (Fish Hatchery)

1/7/2009

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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
Fltpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Fltpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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
Growth Factor (vph)	100%	100%		100%	100%	100%	100%	100%	100%	100%	100%	100%
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			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	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

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%
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

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Synchro 7 - Report

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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Synchro 7 - Report

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	0.850
Flt Protected	0.954			0.954		0.950			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			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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	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	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	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	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	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:NBT and 6:SBTL, Start of Green

Natural Cycle: 60

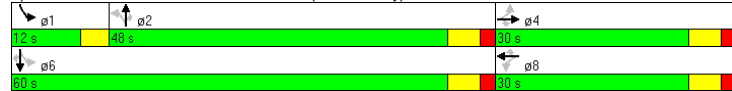
Control Type: Actuated-Coordinated

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

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	
Fltpb, ped/bikes	1.00	0.98		1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98	
Flpfb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt	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	0.95	1.00	0.95	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		37.3		37.3		49.1	
Effective Green, g (s)		28.9			28.9		37.3		37.3		49.1	
Actuated g/C Ratio		0.32		0.32	0.32		0.41		0.41		0.55	
Clearance Time (s)		6.0		6.0	6.0		6.0		6.0		3.5	
Vehicle Extension (s)		2.0		2.0	2.0		5.0		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		
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		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									

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)	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	

C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Analysis\5. 2035 Build\IMP\PM.syn
Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	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
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

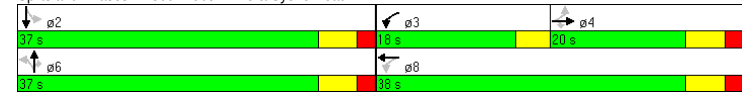
30th %ile Actuated Cycle: 69.8

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



C:\JOBS\945 McGaw Neighborhood Fitchburg\TIA\Analysis\5. 2035 Build\IMP\PM.syn
Traffic Analysis & Design, Inc.

Synchro 7 - Report

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	
Flpb, 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)

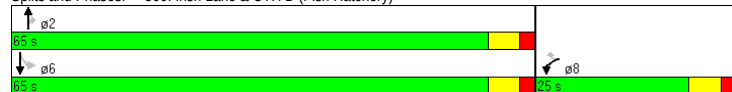
1/7/2009

	↖	↗	↑	↘	↙	↓
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
Fltpb, ped/bikes	1.00	0.98	1.00	0.98	1.00	1.00
Flpfb, 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 #						
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
* L'     (m)     40.00     80.00     40.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh      1249     1509     2206
* AVE DELAY mins     0.08     0.09     0.55
* MAX DELAY mins     0.12     0.13     1.21
* AVE QUEUE  veh      1        1        19
* MAX QUEUE  veh      1        2        39
*
* AVEDEL s      21.8
* LOS SIG      C
* LOS UNSIG    C
*
* VEHIC HRS     20.4
* COST $        307
*
*****

```

```

*****
*
*      9:1:09                2035 BUILD - CHERYL/NEW LACY                45
*
*****
*
* E      (m)      7.92      7.31      8.53
* L'     (m)     40.00     80.00     40.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP      0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1602     1187     2187
* AVE DELAY mins     0.09     0.92     0.06
* MAX DELAY mins     0.14     2.01     0.08
* AVE QUEUE  veh      2        16        1
* MAX QUEUE  veh      2        36        2
*
* AVEDEL s      21.2
* LOS SIG      C
* LOS UNSIG    C
*
* VEHIC HRS     18.9
* COST $        283
*
*****

```

```

*****
*
*      9:1:09                2035 BUILD - CHERYL/NEW LACY                46
*
*****
*
* E      (m)      7.92      7.31      8.53
* L'     (m)     40.00     80.00     40.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP          0          0          0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min     15 75
* TIME COST        $/hr    15.00
* FLOW PERIOD      min     15 75
* FLOW TYPE        pcu/veh   VEH
* 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
* CAPACITY      veh     1445     1706     2403
* AVE DELAY     mins     0.07     0.07     0.20
* MAX DELAY     mins     0.09     0.10     0.36
* AVE QUEUE     veh        1        1        7
* MAX QUEUE     veh        1        1     11
*
* AVEDEL s      8.8
* LOS SIG       A
* LOS UNSIG     A
*
* VEHIC HRS     8.2
* COST $        123
*
*****

```

```

*****
*
*      9:1:09                2035 BUILD - CHERYL/NEW LACY                47
*
*****
*
* E      (m)      7.92      7.31      8.53
* L'     (m)     40.00     80.00     40.00
* V      (m)      7.31      3.65      7.31
* RAD    (m)     25.00     25.00     25.00
* PHI    (d)     30.00     30.00     30.00
* DIA    (m)     50.00     50.00     50.00
* GRAD SEP          0          0          0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min     15 75
* TIME COST        $/hr    15.00
* FLOW PERIOD      min     15 75
* FLOW TYPE        pcu/veh   VEH
* 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
* CAPACITY      veh     1799     1384     2384
* AVE DELAY     mins     0.07     0.23     0.05
* MAX DELAY     mins     0.10     0.42     0.07
* AVE QUEUE     veh        1        4        1
* MAX QUEUE     veh        1        7        1
*
* AVEDEL s      7.0
* LOS SIG       A
* LOS UNSIG     A
*
* VEHIC HRS     6.3
* 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
*
*****

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```

*****
*
*      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
*
*****

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```

*****
*
*   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
*
*****

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*****
*
* 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
*
*****

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```

*****
*
* 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
*
*****

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```

*****
*
*      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
*
*****

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```

*****
*
* 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
*
*****

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```

*****
*
* 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
*
*****

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```

*****
*
*   9:1:09                2035 BUILD - LACY/NOBEL                47
*
*****
*
* E      (m)      7.92    4.27    4.27    7.13
* L'     (m)     40.00  100.00  40.00  100.00
* V      (m)      7.31    3.65    3.65    3.65
* RAD    (m)     25.00   20.00   20.00   25.00
* PHI    (d)     30.00   30.00   30.00   30.00
* DIA    (m)     50.00   50.00   50.00   50.00
* GRAD SEP      0        0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1438      703      759     1414
* AVE DELAY mins    0.07    0.26    0.39    0.14
* MAX DELAY mins    0.10    0.41    0.69    0.21
* AVE QUEUE  veh      1        2        4        2
* MAX QUEUE  veh      1        3        6        3
*
* AVEDEL s 12.1
* LOS SIG B
* LOS UNSIG B
*
* VEHIC HRS 8.6
* COST $ 129
*
*****

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```

*****
*
*   9:1:09                2035 BUILD - LACY/NOBEL                48
*
*****
*
* E      (m)      7.92    4.27    4.27    7.13
* L'     (m)     40.00  100.00  40.00  100.00
* V      (m)      7.31    3.65    3.65    3.65
* RAD    (m)     25.00   20.00   20.00   25.00
* PHI    (d)     30.00   30.00   30.00   30.00
* DIA    (m)     50.00   50.00   50.00   50.00
* GRAD SEP      0        0        0        0
*
* TIME PERIOD      min      90
* TIME SLICE       min      15
* RESULTS PERIOD   min 15 75
* TIME COST        $/hr 15.00
* FLOW PERIOD      min 15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1744      687      612     1503
* AVE DELAY mins    0.05    1.10    0.46    0.06
* MAX DELAY mins    0.07    2.27    0.83    0.08
* AVE QUEUE  veh      1        11       4        1
* MAX QUEUE  veh      1        24       6        1
*
* AVEDEL s 25.6
* LOS SIG C
* LOS UNSIG D
*
* VEHIC HRS 15.9
* COST $ 238
*
*****

```

```

*****
*
*   9:1:09                2035 BUILD - LACY/NOBEL                49
*
*****
*
* E      (m)    7.92    4.27    4.27    7.13
* L'     (m)   40.00  100.00  40.00  100.00
* V      (m)    7.31    3.65    3.65    3.65
* RAD    (m)   25.00   20.00   20.00   25.00
* PHI    (d)   30.00   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00   50.00
* GRAD SEP      0      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1635      900      956     1611
* AVE DELAY mins     0.06     0.14     0.17     0.09
* MAX DELAY mins     0.08     0.20     0.25     0.14
* AVE QUEUE  veh       1       1       2       2
* MAX QUEUE  veh       1       1       2       2
*
* AVEDEL s      6.5
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     4.6
* COST $        69
*
*****

```

```

*****
*
*   9:1:09                2035 BUILD - LACY/NOBEL                50
*
*****
*
* E      (m)    7.92    4.27    4.27    7.13
* L'     (m)   40.00  100.00  40.00  100.00
* V      (m)    7.31    3.65    3.65    3.65
* RAD    (m)   25.00   20.00   20.00   25.00
* PHI    (d)   30.00   30.00   30.00   30.00
* DIA    (m)   50.00   50.00   50.00   50.00
* GRAD SEP      0      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1941      884      808     1700
* AVE DELAY mins     0.04     0.24     0.18     0.05
* MAX DELAY mins     0.06     0.39     0.28     0.07
* AVE QUEUE  veh       0       3       1       0
* MAX QUEUE  veh       1       4       2       1
*
* AVEDEL s      7.7
* LOS SIG      A
* LOS UNSIG    A
*
* VEHIC HRS     4.7
* COST $        71
*
*****

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```

*****
*
*   9:1:09                2035 BUILD - CHERYL/FAHEY                30
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1010    594   1024
* AVE DELAY mins    0.30   0.10   0.09
* MAX DELAY mins    0.49   0.14   0.12
* AVE QUEUE  veh      4      0      1
* MAX QUEUE  veh      6      0      1
*
* AVEDEL s    13.8
* LOS SIG     B
* LOS UNSIG   B
*
* VEHIC HRS   4.5
* COST $      68
*
*****

```

```

*****
*
*   9:1:09                2035 BUILD - CHERYL/FAHEY                31
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* CAPACITY  veh     1024    728   1010
* AVE DELAY mins    0.12   0.09   0.68
* MAX DELAY mins    0.17   0.11   1.34
* AVE QUEUE  veh      1      0     11
* MAX QUEUE  veh      1      0     19
*
* AVEDEL s    27.4
* LOS SIG     C
* LOS UNSIG   D
*
* VEHIC HRS   11.4
* COST $     172
*
*****

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```

*****
*
* 9:1:09                2035 BUILD - CHERYL/FAHEY                32
*
*****
*
* E      (m)    4.27    4.27    4.27
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
* L'     (m)   40.00   40.00   40.00
* V      (m)    3.65    3.65    3.65
* RAD    (m)   20.00   20.00   20.00
* PHI    (d)   30.00   30.00   30.00
* DIA    (m)   40.00   40.00   40.00
* GRAD SEP      0      0      0
*
* TIME PERIOD      min    90
* TIME SLICE       min    15
* RESULTS PERIOD   min   15 75
* TIME COST        $/hr  15.00
* FLOW PERIOD      min   15 75
* FLOW TYPE        pcu/veh  VEH
* 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
*
*****

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