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October 6, 2021

Mr. Brian Groth. Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Town of Hudson Planning Board Review – Traffic Study Review
Friars Drive Industrial Facilty Site Plan, 161 Lowell Road
Tax map 209 Lot 1, #1350-975
Reference No. 20030249.2060

Dear Mr. Groth,

We have received the review comments from Fuss & O'Neill regarding the traffic report that was prepared for the proposed High-Cube Warehouse project on Friars Drive as noted above. We offer the following responses to the concerns.

4. Traffic

a. According to the Town of Hudson, NH Zoning Ordinance 334-11, Pelham Road is classified as a collector road. Pelham Road's classification should be revised in the report.

The report has been updated stating Pelham Road is a collector road on page 3 of the traffic report.

b. The report lists the construction of an additional receiving lane on Wason Road eastbound to accept the two right-turning lanes from Lowell Road northbound as a traffic mitigation improvement from the CMAQ and HLC projects. As the northbound Lowell Road approach currently exists, only one right-turn lane is provided. If the CMAQ and HLC projects propose to construct an additional right-turn lane at the northbound Lowell Road approach or restripe the approach, it should be clarified in the report.

The report has been updated on page 8 to note that a second northbound right turn lane is also proposed by HLC as part of their improvements at the Lowell Road/Wason Road intersection.

c. Additionally, the report lists the construction of an extra lane from Flagstone Drive to Sagamore Bridge as part of the CMAQ project, which will also involve moving a mast arm.

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Analyzing the provided Synchro reports, it appears that the southbound approach at the Lowell Road and Flagstone Drive intersection was modeled with an additional lane under No-Build conditions. The report should clarify whether the extra lane from Flagstone Drive to Sagamore Bridge is this additional southbound lane.

The report has been updated on page 8 to identify this and other CMAQ improvements that are included in the baseline conditions of this study.

d. The westbound Executive Drive approach signal timings seem to have been modeled with 3 seconds of lost time in the 2022 AM No-Build and Build conditions, as well as 2022 and 2032 PM No-Build and Build conditions. It appears that the timings in the Langan traffic impact study for the HLC project, which are the timings used for the No-Build conditions in the TFM report, also had this same lost time. While the TFM report signal timings, at this approach, does correctly match the timings proposed by the Langan traffic impact study for the HLC project, the reasoning behind this lost time is unclear. If there is a reason this lost time has been included in the signal timings for this intersection, it should be provided. See attached PDF.

The lost time was carried through to match the Langan traffic report. The models have been revised to add the 3 seconds of lost time to Phase 4 (ϕ4) to correspond with Phase 8 (ϕ8) which shares the ring. The results tables have been updated in Section 10 of the traffic report and the updated Synchro runs attached (Appendix G – I). The updated results continue to show the impacts of the development on the corridor are negligible.

e. Similarly, the southbound Lowell Road approach at its intersection with Pelham Road signal timings seem to have been modeled with 13 seconds of lost time under all No-Build and Build conditions. It appears that the timings in the Langan traffic impact study for the HLC project, which are the timings used for the No-Build conditions in the TFM report, also had this same lost time. While the TFM report signal timings at this approach do correctly match the timings proposed by the Langan traffic impact study for the HLC project, the reasoning behind this lost time is unclear. If there is a reason this lost time has been included in the signal timings for this intersection, it should be provided. See attached PDF.

The lost time was carried through to match the Langan traffic report. The model will be revised to add the 13 seconds of lost time to Phase 2 (ϕ2) to match the total time of phases 5 & 6 (ϕ5 & ϕ6) which share the ring. The results tables have been updated in Section 10 of the traffic report and the updated Synchro runs attached (Appendix G – I). The updated results continue to show the impacts of the development on the corridor are negligible.

f. Overall, the procedures that the TFM report uses are reasonable and use appropriate ITE trip generation information for the scenario provided. We agree that although the Sagamore Bridge interchange is expected to operate over-

capacity in the Build condition, the proposed warehouse development will contribute almost negligibly to this and should not be responsible to propose further mitigation. The mitigation proposed at the Lowell Road and Executive Drive intersection, one of the major access points to the proposed development, for the 2022 AM peak hour is reasonable and should suffice in relieving any potential issues there. We concur with TFM's overall conclusion that, given the relatively low increase in site-related trips (50 trips during the weekday morning peak hour and 55 trips during the weekday afternoon peak hour) compared to the existing traffic volumes on Lowell Road in this area, there should be minimal observable impacts on traffic operations at any of the study area intersections as a result of the proposed development.

Noted.

We believe that we have adequately addressed all the above mentioned comments. Please let me know if you have any further questions.

Sincerely,
TFMoran Inc.

Robert E. Duval, PE
Chief Engineer

Traffic Report

Traffic Impact and Access Study

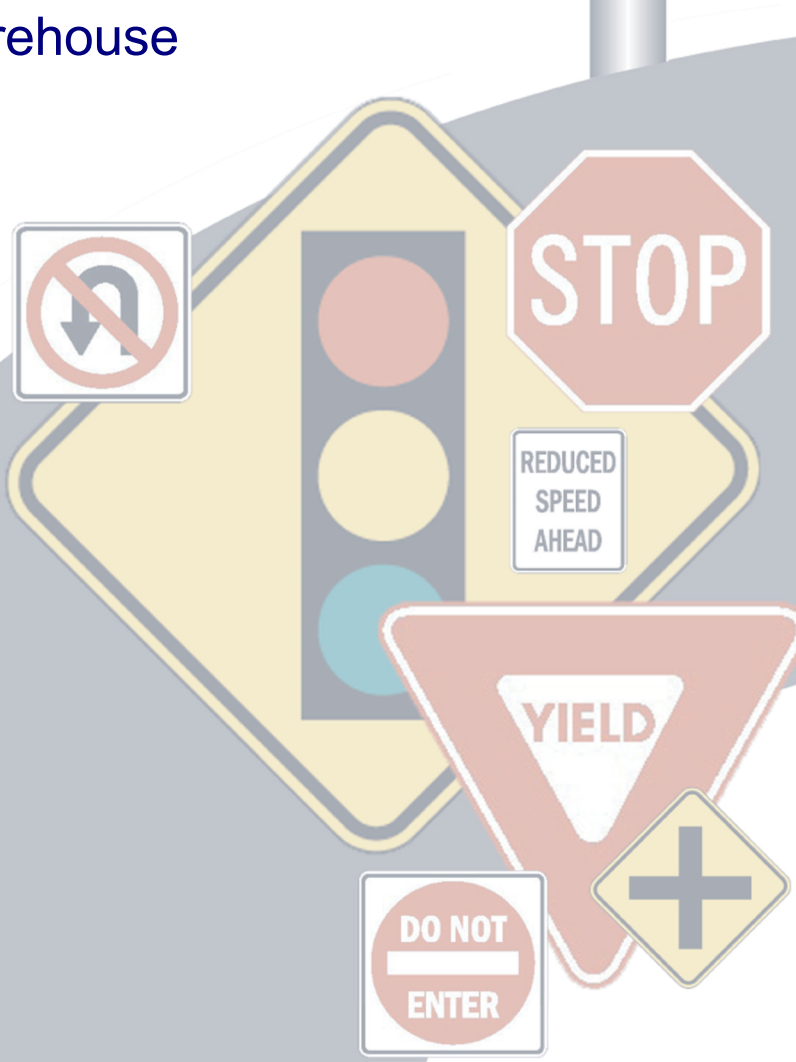
Proposed Distribution Warehouse

Friars Drive
Hudson, New Hampshire

TFM Project #16415.08

September 7, 2021
October 6, 2021 Rev1

Prepared for:
GFI Partners



Prepared by:

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Traffic Impact and Access Study
Distribution Warehouse

Friars Drive, Hudson NH
September 7, 2021 *(October 6, 2021 Rev1)*

1. Introduction:

On behalf of developer GFI, TFMoran has prepared this Traffic Impact and Access Study to determine the traffic impacts associated with a proposed 504,000 sf High-Cube Transload and Short-Term Storage Warehouse (ITE Land Use Code 154) to be located on Friars Drive at the north end of the Sagamore Industrial Park in Hudson near Lowell Road (NH3A). The objectives of the study are:

- To estimate trip generation and distribution for the proposed development to perform capacity analysis for the project study area
- To determine potential traffic impacts of the proposed development
- To provide recommendations for operational improvements within the study area to accommodate the proposed development's traffic impacts

Proposal

GFI is proposing a 504,000 sf Distribution Warehouse on Friars Drive in Hudson. The building will contain two tenants of approximately equal size and equivalent operations. The site layout is such that each tenant will function independently with separate access to loading docks on opposite sides of the building. Separate access is provided to each tenant's loading and parking areas without having to drive through the other tenant's space. Vehicular parking and truck trailer parking are provided on three sides of the building. Tenant 'A' is provided 191 passenger vehicle parking spaces, with 41 truck slips and 60 loading docks. Tenant 'B' will have 171 parking spaces with 30 truck slips and 44 loading docks. Access to the site is provided by a single driveway onto Friars Drive.

A high-cube warehouse of Land Use Code 154 type (HCW – TSTS) is a building that is typically over 200,000 sf gross square feet of floor area and has a ceiling height of 24 feet or greater It is primarily used of the storage and /or consolidation of manufactured goods prior to their distribution to retail locations or other warehouses. A typical HCW has a high level of on-site automation and logistics management which enable highly-efficient processing of goods through the HCW so there is very little storage duration and high throughput. This type of warehouse will typically see large trucks in and large trucks out, with relatively low levels of small truck activity. Overall trip generation rates are therefore much lower than other warehouse Land Use Codes, such as "Fulfillment Centers" (LUC 155) and "Parcel Hub Centers (LUC 156).

Description of the Site

The existing site (Map 209 Lot 001) is an undeveloped lot located on Friars Drive about one mile north of the Sagamore Bridge. The lot is bounded by single-family residential development to the northwest, townhouses and multi-family developments to the east, and industrial development (Sagamore Park) across Fuller Brook (Third Brook) to the southwest. The

proposed warehouse will occupy the last remaining large undeveloped lot within the Sagamore Industrial Park at its northern end.

Friars Drive formerly dead-ended in the east near Lowell Road, with access via Executive Drive in the west. A connection of Friars Drive to Lowell Road is currently under construction in connection with a new residential development at the northwest corner of Friars Drive and Lowell Road. The new Friars Drive connection to Lowell Road will be restricted to right-in and right-out movements.

Scoping Meeting

At a Traffic Scoping Meeting held on July 20, 2021 with Town Staff, it was agreed that this study would take into account the approved Hudson Logistics Center (HLC) further south along Lowell Road, and an ongoing CMAQ project being designed by VHB for the Town. In order to ensure consistency with these prior traffic studies, the TIAS for this project will be structured as follows:

Study Area:

- Includes the following intersections
  - Lowell Road at Pelham Road
  - Lowell Road at Fox Hollow Drive
  - Lowell Road at Friars Drive (Site Access)
  - Lowell Road at Executive Drive/Private Drive
  - Lowell Road at Hampshire Drive/Oblate Drive
  - Lowell Road at Flagstone Drive/Wason Road
  - Lowell Road at Sagamore Bridge

Volumes:

- Assume HLC project is fully constructed and open prior to opening year of this Friars Drive project (2022)
- Use 2022 Build & 2032 Build Volumes from the HLC study as No-Build volumes for Friars Drive warehouse
- HLC volumes have been adjusted to represent peak month conditions
- Background growth factor taken as 1% per year
- Counts from above referenced HLC study were taken in 2019 (no Covid adjustment needed)

Time Periods for Analysis:

- Opening Year – 2022
- Future Year – 2032
- Weekday AM roadway peak hour (7-9 am)
- Weekday PM roadway peak hour (4-6 pm)
- Saturday Midday peak hour: not studied consistent with HLC study (Saturday warehouse operations do not differ significantly from weekday operations)

Other Developments to Consider:

- BAE warehouse addition (recently completed)
- Friars Drive Apartments (under construction)

Corridor Improvements to be included as complete for No-Build:

- CMAQ project (VHB) – Phase 1&2, 2022 in place by 2022 opening year
  - Add extra lane from Flagstone to Sagamore Bridge, move mast arm
- HLC (per Langan Study - Base Improvements north of Sagamore Bridge)
  - Signal timing in corridor
  - Geometric improvements at Lowell Road and Flagstone/Wason
  - Restriping at Lowell Road and Fox Hollow Drive

2. Existing Conditions

Descriptions of Roadways and Intersections:

Roadways

Lowell Road (NH3A)

- Classification. Lowell Road (NH3A) is a Town-maintained north-south arterial roadway. The north end of Lowell Road terminates at Central Street and to the south the roadway ends at the junction of Dracut Road and River Road.
- Lane widths and usage. In the study area, the roadway provides a 3-lane section with an 11-foot wide two-way left turn lane (TWLTL) in the center from Executive Drive up to Fox Hollow Drive. A five lane section develops from Executive Drive down to Flagstone Drive. Typical lane width is 12 feet with 4-foot wide shoulders.
- Pedestrian facilities. There are sidewalks on both sides of the road from Flagstone Drive to Hampshire Drive. From Hampshire Drive north, there is only a sidewalk on the west side of Lowell Road which terminates about 400’ south of Friars Drive at a residential driveway.
- Signage. The speed limit is posted at 30 mph within the study area. Other traffic signage includes lane use, directional signs, street name signs and stop signs at major driveways. Pavement markings consist of a center TWLTL and shoulder markings in fair to good condition.
- Lighting. Roadway lighting is present at the signalized intersections.

Pelham Road

- Classification. Pelham Road is a Town-maintained east-west collector roadway that begins at Lowell Road and heads east into residential areas.

- Lane widths and usage. In the study area, the roadway provides two 11-foot wide travel lanes in each direction with 4-foot shoulders.
- Pedestrian facilities. There are sidewalks on both sides of the road from Lowell Road extending about 500' eastward.
- Signage. The speed limit is posted at 30 mph within the study area. Other traffic signage includes directional signs, street name signs and stop signs at major driveways.
- Lighting. No roadway lighting.

Fox Hollow Drive

- Classification. Fox Hollow Drive is a private east-west looped roadway that connects to Lowell Road at both ends, with the southern end being part of this study area. The southern connection has an 8-foot wide landscape median separating the entering and exiting traffic from Lowell Road.
- Lane widths and usage. The roadway provides a 12-foot wide lane in each direction with no shoulders.
- Pedestrian facilities. There are no sidewalks along the roadway.
- Signage. The speed limit is posted is 10 mph. Other traffic signage includes private property signs and stop signs.
- Lighting. No roadway lighting.

Nottingham Square Driveway

- Classification. Nottingham Square Driveway is a private drive providing access to the Nottingham Square plaza with a 6-foot wide concrete median at the signalized intersection.
- Lane widths and usage. The driveway provides a 14-foot wide travel lane entering the plaza and a 14-foot wide lane exiting.
- Pedestrian facilities. There are no sidewalks along the driveway.
- Signage. There is no posted speed limit.
- Lighting. Parking lot and driveway lighting is present.

Executive Drive

- Classification. Executive Drive is a Town-maintained east west local roadway. The road heads west into the Sagamore Industrial Park and bends north and terminates at a cul-de-sac.
- Lane widths and usage. The roadway provides one 11-foot wide travel lane in each direction with no shoulders.
- Pedestrian facilities. There are no sidewalks along the road.
- Signage. There is no posted speed limit. Other traffic signage includes lane use, directional signs, street name signs and stop signs at major driveways.
- Lighting. No roadway lighting.

Hampshire Drive

- Classification. Hampshire Drive is a Town-maintained east-west local roadway that connects from Lowell Road to Flagstone Drive.
- Lane widths and usage. The roadway generally provides one 14-foot wide travel lane in each direction with no shoulders.
- Pedestrian facilities. There are no sidewalks along the road.

- Signage. The speed limit is posted at 30 mph. Other traffic signage includes lane use, directional signs, street name signs and stop signs at major driveways.
- Lighting. No roadway lighting.

Oblate Drive

- Classification. Oblate Drive is a private east-west roadway that provides access to a residential development. The roadway entrance has a 5-foot wide median that extends about 100 feet beyond Lowell road, with a fence that separates the roadway lanes extending 100 feet beyond the median.
- Lane widths and usage. The roadway provides a 12-foot wide lane in each direction with 5-foot shoulders on both sides.
- Pedestrian facilities. There are no sidewalks along the roadway.
- Signage. The speed limit is posted is 10 mph. Other traffic signage includes private property signs and stop signs.
- Lighting. There is decorative lighting along the roadway.

Flagstone Drive

- Classification. Flagstone is a Town-maintained east-west local roadway that connects from Lowell Road to Sagamore Park Road.
- Lane widths and usage. The roadway generally provides one 18-foot wide travel lane in each direction with no shoulders.
- Pedestrian facilities. There are no sidewalks along the road.
- Signage. The speed limit is posted at 30 mph. Other traffic signage includes lane use, directional signs, street name signs and stop signs at major driveways.
- Lighting. No roadway lighting.

Wason Road

- Classification. Wason Road is aTown-maintained east-west collector roadway extending from Lowell Road into residential areas.
- Lane widths and usage. The roadway provides 11-foot wide travel lanes in both direction with 2-foot shoulders on each side.
- Pedestrian facilities. There are sidewalks on the south side of the roadway for the length of the Goodwill plaza.
- Signage. The speed limit is posted at 30 mph within the study area. Other traffic signage includes lane use, directional signs, street name signs and stop signs at major driveways.
- Lighting. Lighting is present at roadway intersections.

Intersections

Lowell Road at Pelham Road

Traffic Control.

- Existing 3-way signalized “T” intersection.
- Pedestrian crosswalk and pushbutton-actuated ped signals are provided at the westbound approach, with an exclusive all-red pedestrian phase.

Approaches.

- Lowell Road (Route 3A) Southbound – one thru lane with approximately 1,310 feet of storage and one left-turn lane with approximately 150 feet of storage.

- Pelham Road Westbound – one right-turn lane with approximately 75 feet of storage and one left-turn lane with approximately 510 feet of storage.
- Lowell Road (Route 3A) Northbound – one shared right-turn/thru lane with approximately 550 feet of storage.

Lowell Road at Fox Hollow Drive

Traffic Control.

- Existing 4-way signalized intersection.
- Pedestrian crosswalks and pushbutton-actuated ped signals are provided at the westbound and southbound approaches, with an exclusive all-red pedestrian phase.

Approaches.

- Lowell Road (Route 3A) Southbound – one shared right-turn/thru lane with approximately 550 feet of storage and one left-turn lane with approximately 125 feet of storage.
- Nottingham Square Driveway – one right-turn lane with approximately 100 feet of storage and one left-turn/thru lane with approximately 260 feet of storage.
- Lowell Road (Route 3A) Northbound – one right-turn lane with approximately 325 feet of storage, one thru lane with approximately 1,410 feet of storage, and one left-turn lane with approximately 210 feet of storage.
- Fox Hollow Drive – one right-turn lane with approximately 50 feet of storage and one left-turn/thru lane with approximately 600 feet of storage.

Lowell Road at Friars Drive (under construction)

Traffic Control.

- 3-way unsignalized intersection currently under construction.
- No pedestrian facilities proposed.

Approaches.

- Lowell Road (Route 3A) Southbound – one thru lane, TWLTL.
- Friars Road Westbound – right-turn lane out only.
- Lowell Road (Route 3A) Northbound – one thru lane, TWLTL.

Lowell Road at Executive Drive/Private Drive

Traffic Control.

- Existing 4-way signalized intersection.
- Pedestrian crosswalks and pushbutton-actuated ped signals are provided at the eastbound approach.

Approaches.

- Lowell Road (Route 3A) Southbound – one right-turn/thru lane with approximately 1,170 feet of storage, one thru lane with approximately 1,170 feet of storage, and one left-turn lane with approximately 150 feet of storage.
- Executive Drive Westbound – one right-turn lane with approximately 80 feet of storage and one left-turn/thru lane with approximately 580 feet of storage.
- Lowell Road (Route 3A) Northbound – one right-turn/thru lane with approximately 1,790 feet of storage, one thru lane with approximately 1,790 feet of storage, and one left-turn lane with approximately 350 feet of storage.

- Executive Drive Eastbound – one right-turn lane with approximately 225 feet of storage and one left-turn/thru lane with approximately 490 feet of storage.

Lowell Road at Hampshire Drive/Oblate Drive

Traffic Control.

- Existing 4-way signalized intersection.
- Pedestrian crosswalks and pushbutton-actuated ped signals are provided at the eastbound and northbound approaches.

Approaches.

- Lowell Road (Route 3A) Southbound – right-turn/thru lane with approximately 1,790 feet of storage, one thru lane with approximately 1,790 feet of storage, and one left-turn lane with approximately 225 feet of storage.
- Oblate Drive – one right-turn lane with approximately 100 feet of storage and one left-turn/thru lane with approximately 380 feet of storage.
- Lowell Road (Route 3A) Northbound – one right-turn/thru lane with approximately 1,520 feet of storage, one thru lane with approximately 1,520 feet of storage, and one left-turn lane with approximately 225 feet of storage.
- Hampshire Drive – one right-turn lane with approximately 100 feet of storage and one left-turn/thru lane with approximately 500 feet of storage.

Lowell Road at Flagstone Drive/Wason Road

Traffic Control.

- Existing 4-way signalized intersection.
- Pedestrian crosswalks and pushbutton-actuated ped signals are provided at all four approaches. .

Approaches.

- Lowell Road (Route 3A) Southbound – one right-turn/thru lane with approximately 1,520 feet of storage, one thru lane with approximately 1,520 feet of storage, and one left-turn lane with approximately 175 feet of storage.
- Wason Road – one right-turn lane with approximately 75 feet of storage, one left- turn/thru lane with approximately 590 feet of storage, and one left-turn lane with approximately 200 feet of storage.
- Lowell Road (Route 3A) Northbound – one right-turn lane with approximately 275 feet of storage, two thru lanes with approximately 1,000 feet of storage, and one left-turn lane with approximately 575 feet of storage.
- Flagstone Drive – one right-turn lane with approximately 250 feet of storage and one left-turn/thru lane with approximately 810 feet of storage.

Lowell Road at Sagamore Bridge

Traffic Control.

- Existing 4-way signalized intersection.
- There are no pedestrian facilities at the intersection.

Approaches.

- Lowell Road (Route 3A) Southbound – two thru lanes with approximately 1,000 feet of storage and a channelized free-right-turn lane that diverges from the thru lanes approximately 330 feet from the intersection with minimal storage upstream prior to the exit ramp.

- Lowell Road (Route 3A) Northbound – two thru lanes with approximately 1,200 feet of storage and two left-turn lanes with approximately 525 feet of storage.
- Sagamore Bridge Road Eastbound – two left-turn lanes and a channelized free- right-turn lane.

Proposed traffic improvements from CMAQ and HLC projects

Proposed traffic mitigation improvements from CMAQ and HLC projects and included in the baseline conditions for this study:

CMAQ

- At Lowell Road and Flagstone Road/Wason Road: construct an additional southbound lane to provide and exclusive left turn lane, two through lanes and a through/right lane.
- At Lowell road and Sagamore Bridge: construct an additional southbound right turn lane.

HLC

- Signal timing optimization at the following intersections
    - Lowell Road (3A) & Executive Drive during the 2032 weekday morning peak periods
    - Lowell Road (3A) & Fox Hollow Drive
- Construct a third northbound left turn lane at the intersection of Lowell Road and Sagamore Bridge Road.
- Construction of the following geometric improvements at the intersection of Lowell Road and Flagstone Road/Wason Road
    - Construct a second northbound right turn lane
    - Construct an additional receiving lane on Wason Road eastbound to accept the two right-turning lanes from Lowell Road northbound
    - Remove exclusive left turn lanes into the Goodwill shopping center and the Market Basket shopping center to accommodate the additional travel lane
    - Provide a lane drop approximately 850 feet east of Lowell Road to meet existing Wason Road eastbound geometry
- Restripe at the intersection of Lowell Road and Fox Hollow Drive of the northbound right-turn -only lane to a shared thru/right-turn lane. Two northbound thru receiving lanes currently exist.

3. Background Volumes:

Background volumes for this study are taken directly from the Langan Traffic Impact Study that was performed in 2020 for the proposed Hudson Logistics Center that is proposed just south of the Sagamore Bridge at the site of the former Green Meadow Golf Club with access onto Lowell Road. The traffic study and proposed mitigation improvements have been approved and will be incorporated into the traffic network; therefore, the Town has asked that we prepare our study with the proposed Logistics Center project and roadway improvements in place.

The traffic volumes for 2022 are taken directly from Figure 8 for both AM and PM peak hours. Volumes for 2032 are based on Figure 9 for both AM and PM peak hours.

4. No-Build Volumes:

To establish No-Build volumes for this study, the following adjustments were made to the Langan HLC study 2022/2032 Build volumes.

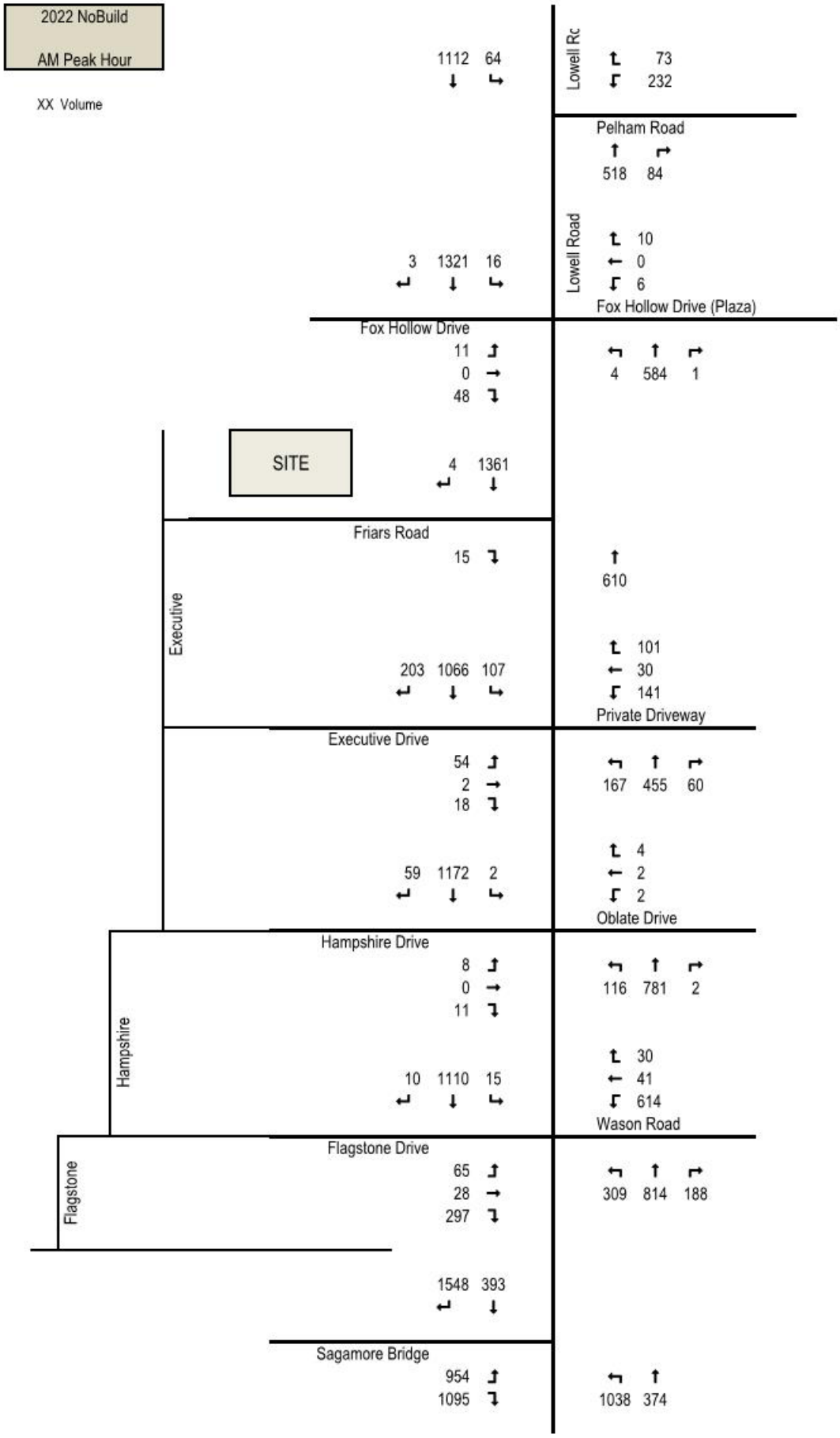
Other Developments
Two projects in the vicinity of the proposed warehouse have been included as "Other Developments" to create the No-Build case for this study.

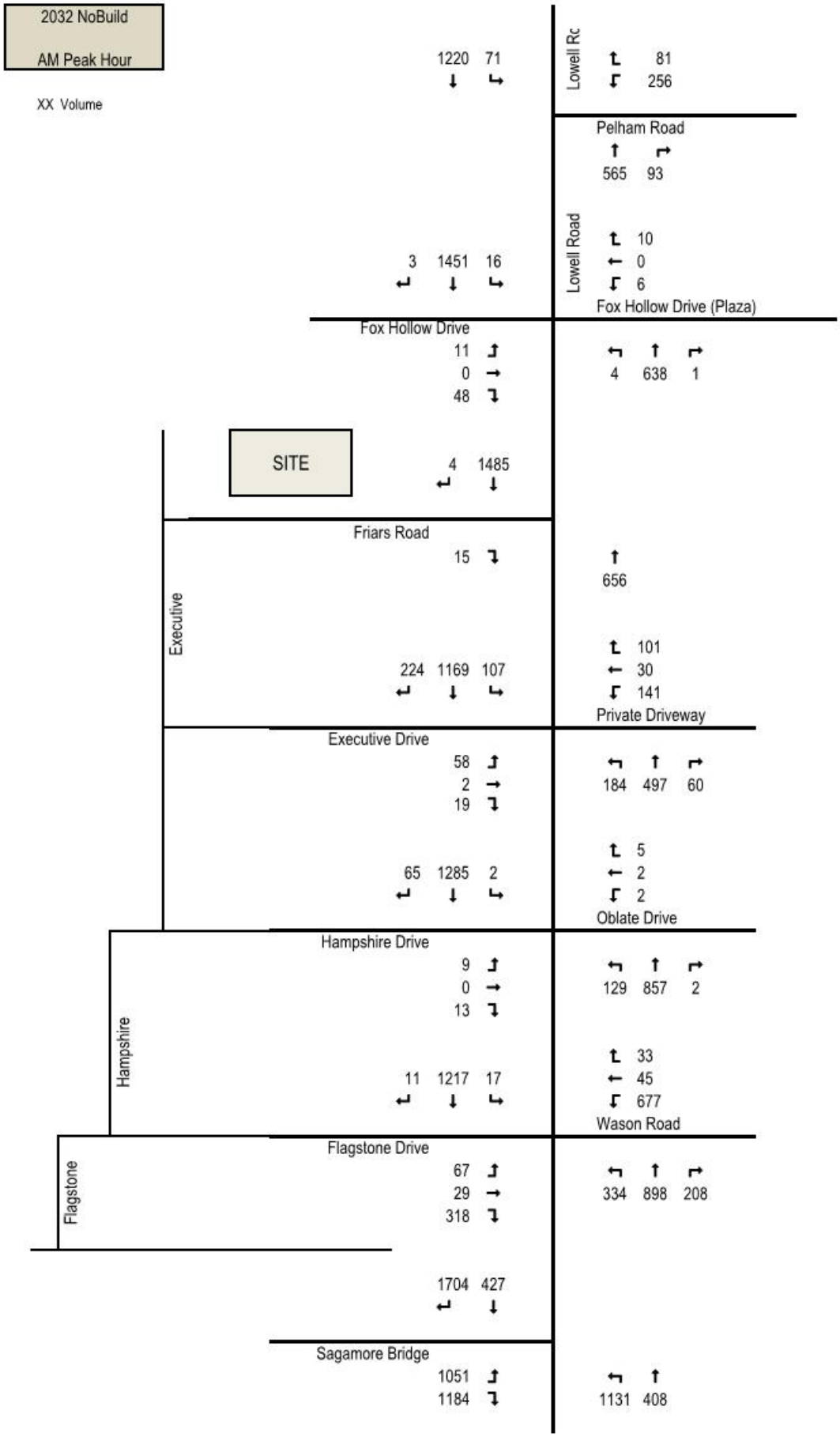
- Friars Drive Apartments: 81-unit apartment development within two 3-story buildings at the corner of Lowell Road and Friars Drive.
  - 30 trips AM Peak Hour (8 in/ 22 out)
  - 36 trips PM Peak Hour (22 in/ 14 out)
  - Directional Distribution of predominant traffic flow on Lowell Road (3A)
    - AM 68% NB
    - PM 62% SB
- 36 Executive Drive: 100,000 sf building addition at the north end of the existing building.
  - CASE C (Hypothetical Buildout Scenario)
    - 3 shifts, 30 employees (max) per shift, 22 active loading docks
    - 36 trips AM Peak Hour (3 in/ 33 out)
    - 8 trips PM Peak Hour (4 in/ 4 out)
    - Distribution: 35% use Executive Drive for access, 65% use Flagstone Drive to/from site
    - Peak hour for warehouse traffic does not coincide with the peak hour for NH3A traffic

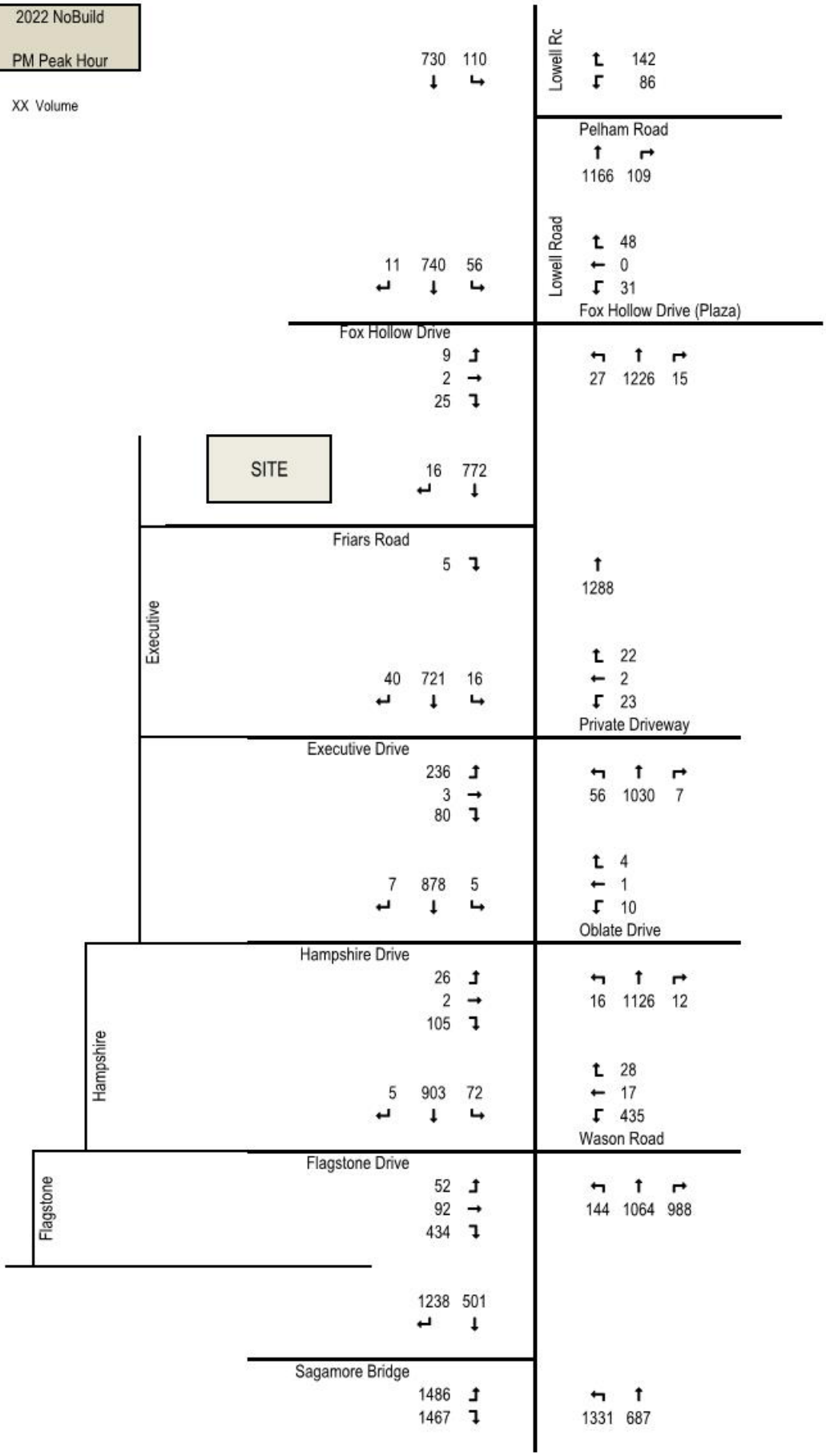
Because separate traffic analyses were not required by the Town for the two development projects listed above, the following assumptions were made for distribution of those trips along the corridor.

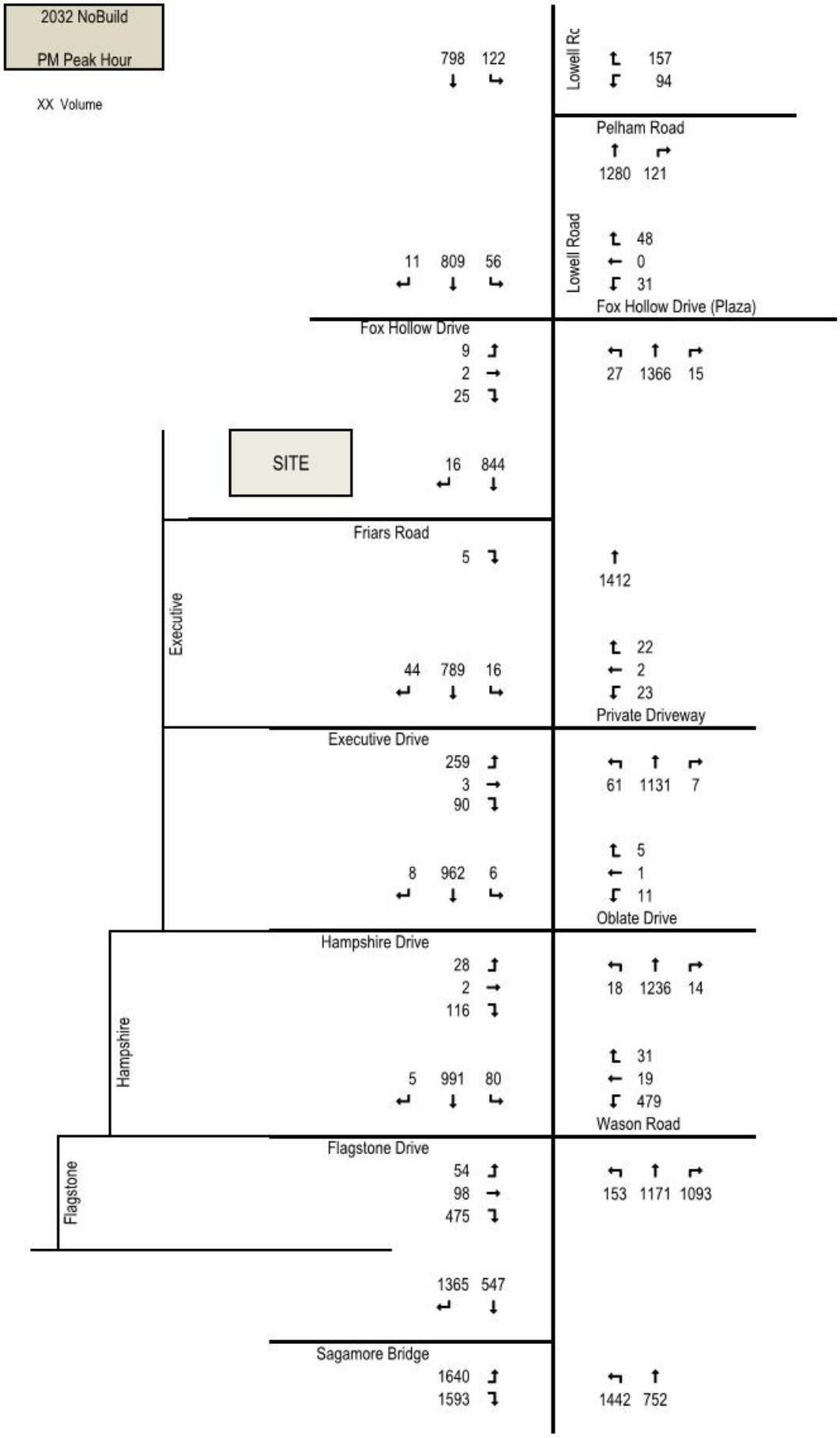
- Friars Drive Apartments:
  - AM: 68% NB, 32% SB
    - NB ENTER: 35% use Exec. Dr, 65% use Flagstone Dr
    - SB ENTER: All at Friars Dr
    - SB EXIT: All at Friars, NB EXIT: All at Executive Dr
  - PM: 38% NB, 62% SB
    - NB ENTER: 35% use Exec. Dr, 65% use Flagstone Dr
    - SB ENTER: All at Friars Dr
    - SB EXIT: All at Friars, NB EXIT: All at Executive Dr
- 36 Executive Drive:
  - AM: 68% NB, 32% SB
    - ENTER/EXIT: 35% use Executive Dr, 65% use Flagstone Dr
  - PM: 38% NB, 62% SB
    - ENTER/EXIT: 35% use Executive Dr, 65% use Flagstone Dr

A summary of total no-build volumes for the opening and future years are presented in the following figures.


2022 NoBuild
AM Peak Hour
XX Volume
1112 64
Lowell Rc
73
232
Pelham Road
518 84
Lowell Road
10
0
6
3 1321 16
Fox Hollow Drive (Plaza)
Fox Hollow Drive
11
0
48
4 584 1
SITE
4 1361
Friars Road
15
610
Executive
101
30
141
203 1066 107
Private Driveway
Executive Drive
54
2
18
167 455 60
4
2
2
59 1172 2
Oblate Drive
Hampshire Drive
8
0
11
116 781 2
Hampshire
30
41
614
10 1110 15
Wason Road
Flagstone Drive
Flagstone
65
28
297
309 814 188
1548 393
Sagamore Bridge
954
1095
1038 374


2032 NoBuild
AM Peak Hour
XX Volume
Lowell Rc
1220 71
81
256
Pelham Road
565 93
Lowell Road
10
3 1451 16
0
6
Fox Hollow Drive (Plaza)
Fox Hollow Drive
11
0
48
4 638 1
SITE
4 1485
Friars Road
15
656
Executive
101
224 1169 107
30
141
Private Driveway
Executive Drive
58
2
19
184 497 60
5
65 1285 2
2
2
Oblate Drive
Hampshire Drive
9
0
13
129 857 2
Hampshire
33
11 1217 17
45
677
Wason Road
Flagstone Drive
Flagstone
67
29
318
334 898 208
1704 427
Sagamore Bridge
1051
1184
1131 408


2022 NoBuild
PM Peak Hour
XX Volume
730 110
Lowell Rc
142
86
Pelham Road
1166 109
Lowell Road
48
0
31
Fox Hollow Drive (Plaza)
11 740 56
Fox Hollow Drive
9
2
25
27 1226 15
SITE
16 772
Friars Road
5
1288
Executive
22
2
23
40 721 16
Private Driveway
Executive Drive
236
3
80
56 1030 7
4
1
10
7 878 5
Oblate Drive
Hampshire Drive
26
2
105
16 1126 12
Hampshire
28
17
435
5 903 72
Wason Road
Flagstone Drive
52
92
434
144 1064 988
Flagstone
1238 501
Sagamore Bridge
1486
1467
1331 687


2032 NoBuild
PM Peak Hour
XX Volume
798 122
Lowell Rc
157
94
Pelham Road
1280 121
Lowell Road
48
0
31
Fox Hollow Drive (Plaza)
11 809 56
Fox Hollow Drive
9
2
25
27 1366 15
SITE
16 844
Friars Road
5
1412
Executive
22
2
23
Private Driveway
44 789 16
Executive Drive
259
3
90
61 1131 7
5
1
11
Oblate Drive
8 962 6
Hampshire Drive
28
2
116
18 1236 14
Hampshire
31
19
479
Wason Road
5 991 80
Flagstone Drive
54
98
475
153 1171 1093
Flagstone
1365 547
Sagamore Bridge
1640
1593
1442 752

5. Trip Generation:

The facility that is proposed in this report conforms to the classification known as "High-Cube Transload/Short-Term Storage Warehouse" Land Use Code (LUC) 154. ITE has issued an updated 2020 supplement to the 10th Edition Trip Generation Manual[1] that includes a separate calculation of car and truck trips for this warehouse use. Calculations from the supplement are included in Appendix A and tabulated in the table below.

A typical LUC 154 HCW operates on a 24-hour/three shift schedule with office and warehouse employees and truck arrivals and departures distributed throughout the day, generally outside of roadway peak hours. Common shift changes occur at 7am, 4pm, and 1230am. Using this shift pattern places arrivals and departures of most employees outside of adjacent roadway peak hours. A generally even distribution of trucking arrivals and departures is commonly anticipated.

Table 1 below presents total trip generation (cars and trucks) from the ITE supplement:

Table 1
Trip Generation – per ITE Supplement

Land Use	In	Out	Total
Proposed 504,000 sf Distribution Warehouse (LUC 154)			
Weekday AM Peak Hour Adjacent Street	36	14	50
Weekday PM Peak Hour Adjacent Street	16	39	55

Although, trucking schedules tend to avoid peak hour traffic, we have carried the distribution of trucks per ITE shown below. Table 2 shows a breakdown of car and truck volume calculations:

Table 2
Trip Generation – Cars vs Trucks

	Cars		Trucks	
	In	Out	In	Out
Weekday AM Peak Hour Adjacent Street	31	9	5	5
Weekday PM Peak Hour Adjacent Street	14	36	2	3

6. Trip Generation vs Parking – Distribution Center:

A typical shift schedule base on the High-Cube Transload and Short-Term Storage Warehouse use shows the need for at least 265 parking spaces. The sample shift schedule is outlined in Appendix B. The current plan shows 362 parking spaces.

7. Holiday Trip Generation:

Although some types of warehouses (e.g. "fulfillment centers" and "parcel hub distribution centers") show substantially increased holiday traffic, the proposed facility does not show this marked seasonal increase, and the increase of truck traffic during the holiday season is modest.

[1] *Trip Generation Manual,* Institute of Transportation Engineers (ITE), 10th Edition Supplement, February 2020.

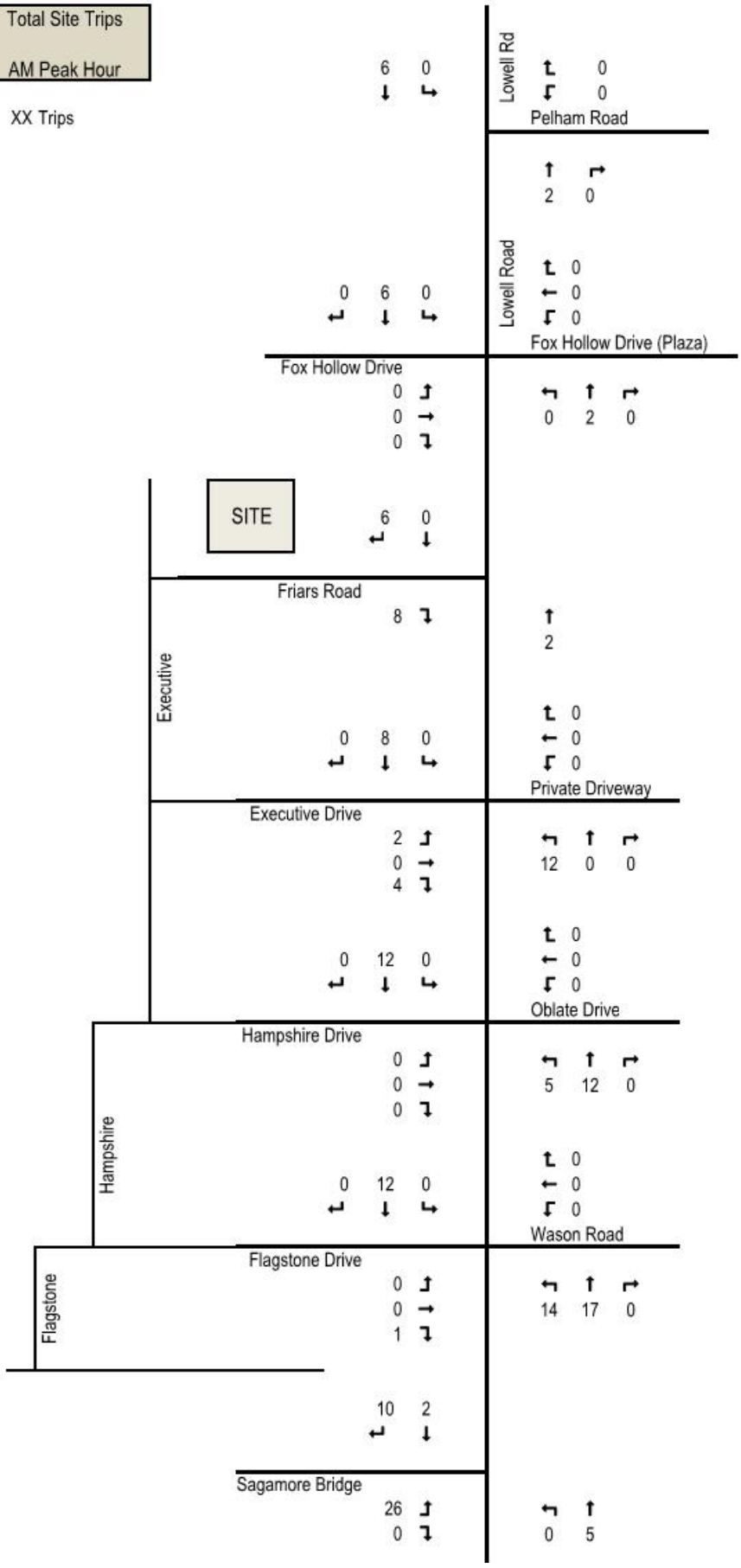
8. Trip Composition and Distribution:

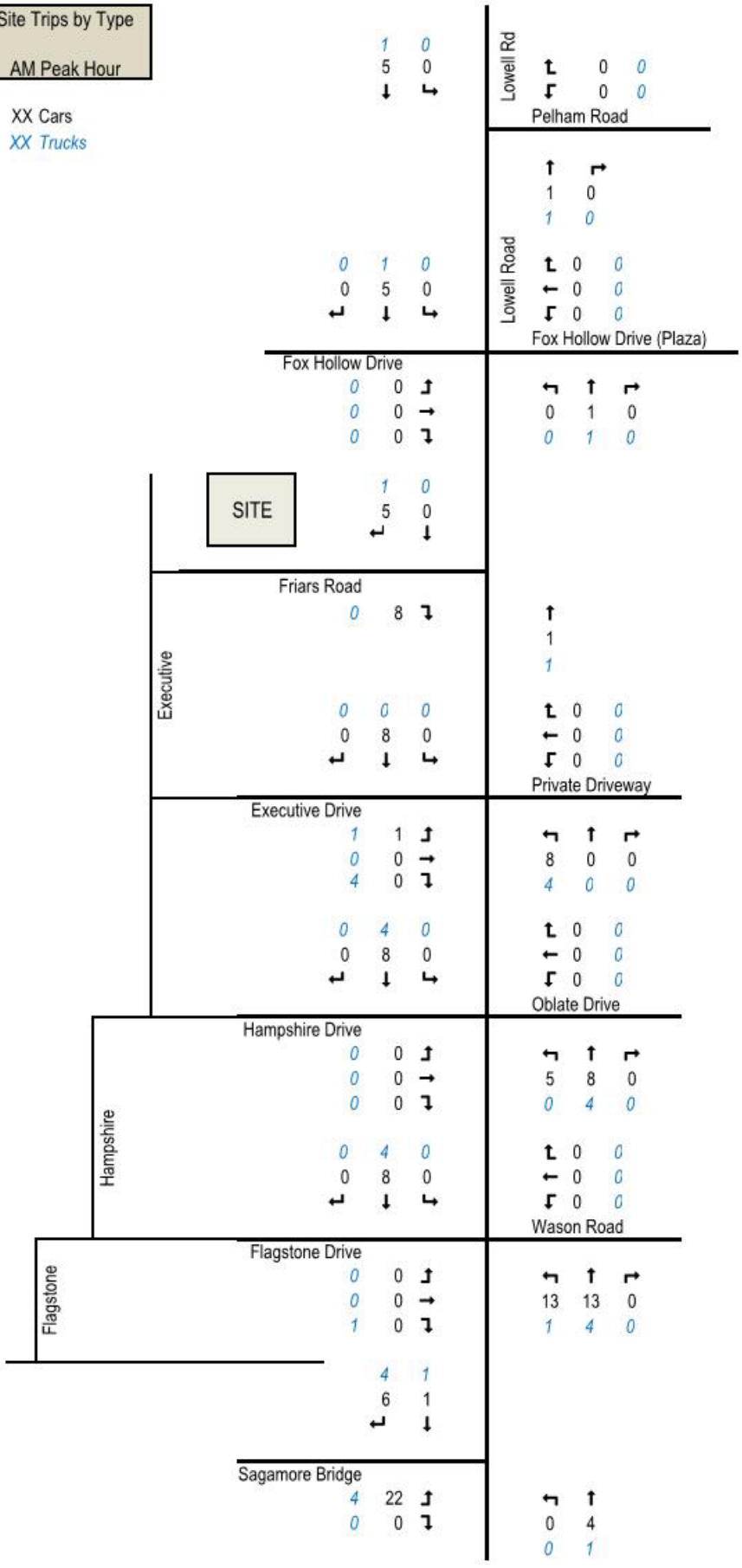
Composition
Based on the proposed use, all trips to the development will be considered Primary, that is, a trip made for the specific purpose of visiting the generator.

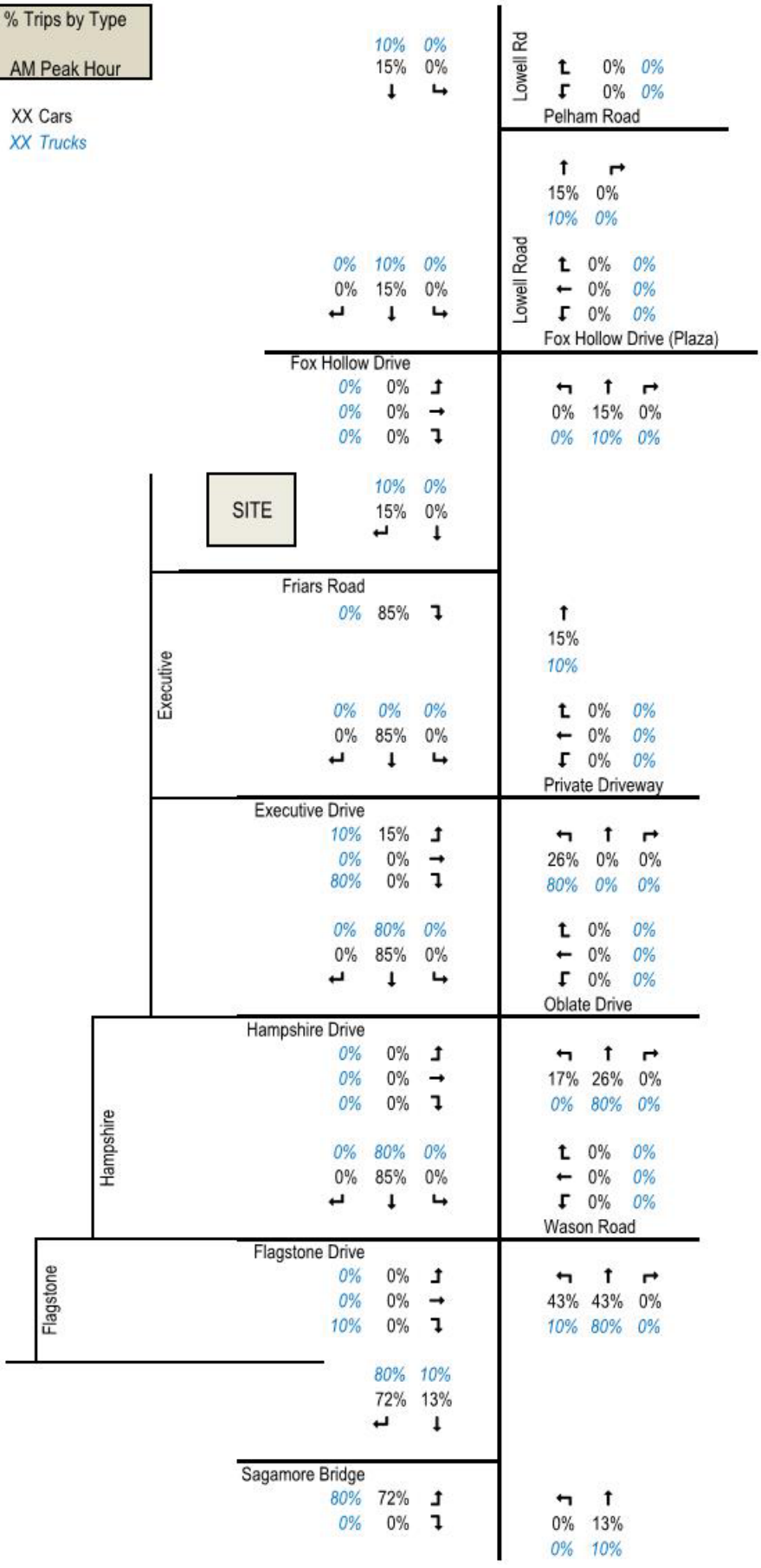
Distribution
Trip distribution for passenger cars (employees) will be based on Journey to Work Data as calculated in the HLC study. That report shows that 15% of employees would be expected to arrive via Lowell Road (NH3A) from the north and the remaining 85% would arrive to the site from the south via US3, Daniel Webster Highway, and NH3A/Dracut Road.

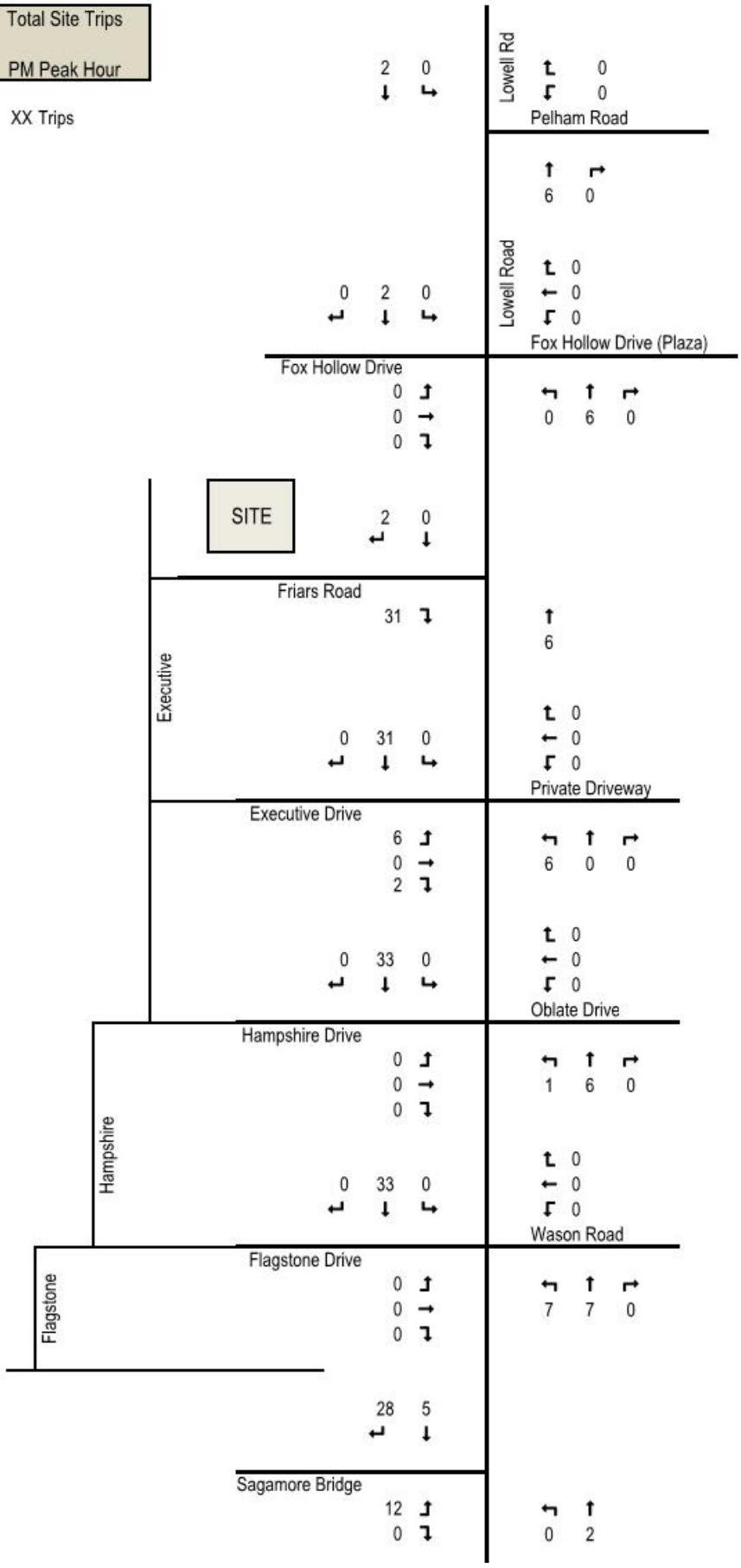
Traffic inbound to Sagamore Park, will be distributed pro-rata based on left turns at Flagstone, Hampshire, and Executive drives. Passenger cars heading south will leave via Friars Drive. However, since left turns out of Friars Drive are not permitted, cars will generally use Executive Drive to access Lowell Road north. At the Sagamore Bridge, most of these site trips will be headed over the bridge, however, some passenger vehicles will have destinations further south and continue on NH3A.

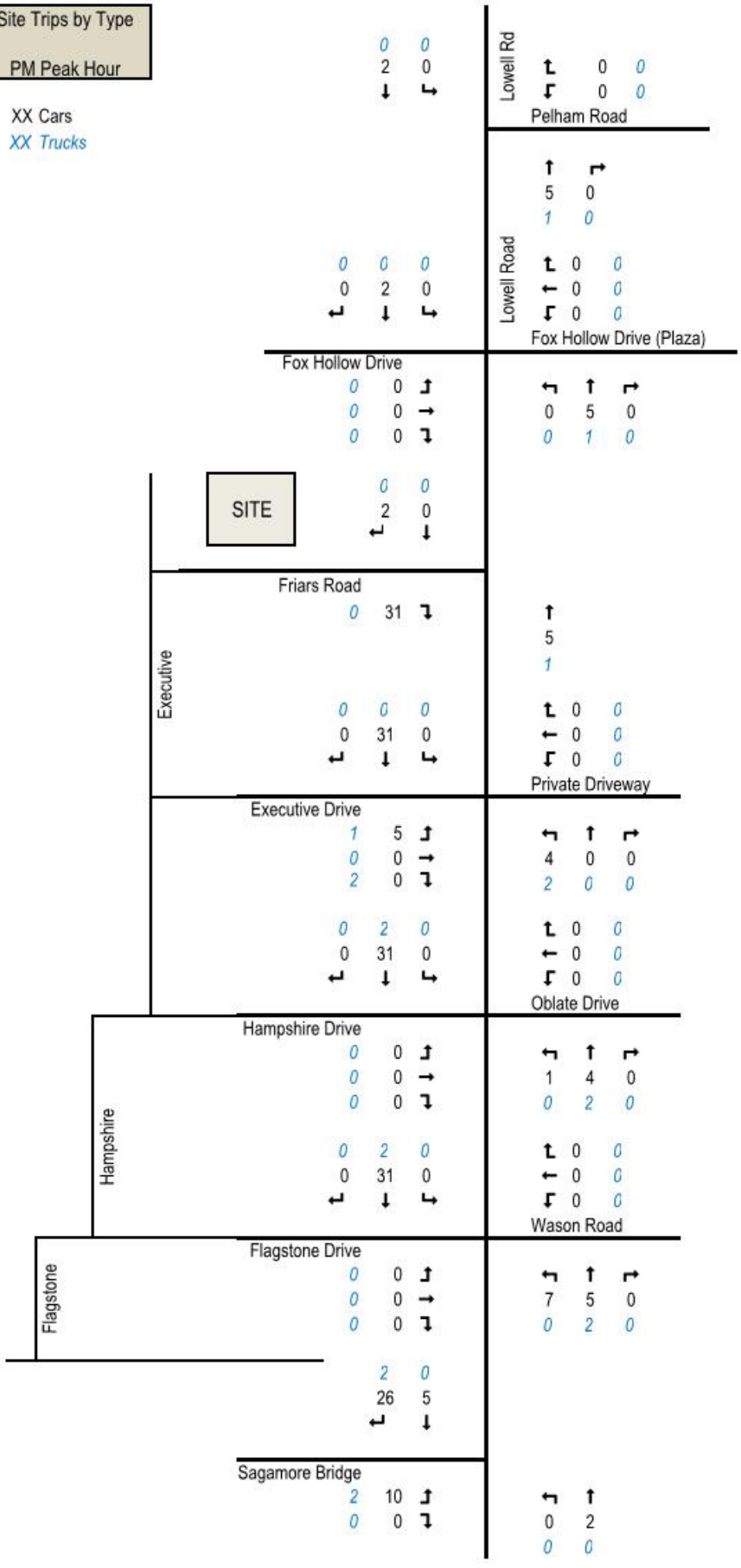
For truck traffic distribution, the appeal of Sagamore Industrial Park to a HCW is its proximity to the Everett Turnpike. Getting into the interstate highway system quickly is a major benefit for distribution operations. We therefore carried an assumption that 80% of truck trips will arrive and depart using the Sagamore Bridge within this study area. Since there is a possibility of deliveries locally as well, 10% of truck trips are assigned to NH3A north of the site and 10% to NH3A south of the bridge.

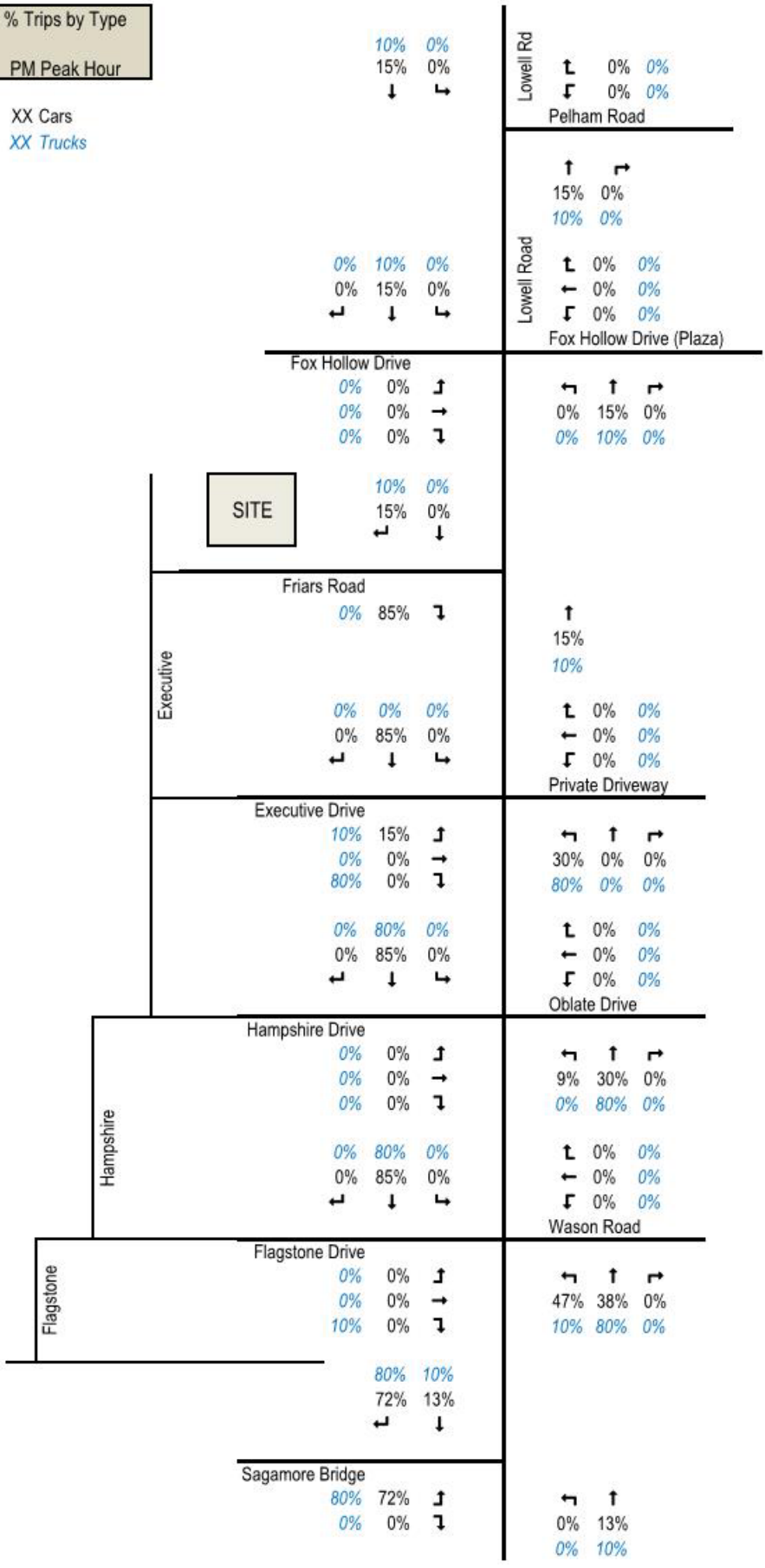

Total Site Trips
AM Peak Hour
XX Trips
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge


Site Trips by Type
AM Peak Hour
XX Cars
XX Trucks
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge


% Trips by Type
AM Peak Hour
XX Cars
XX Trucks
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge

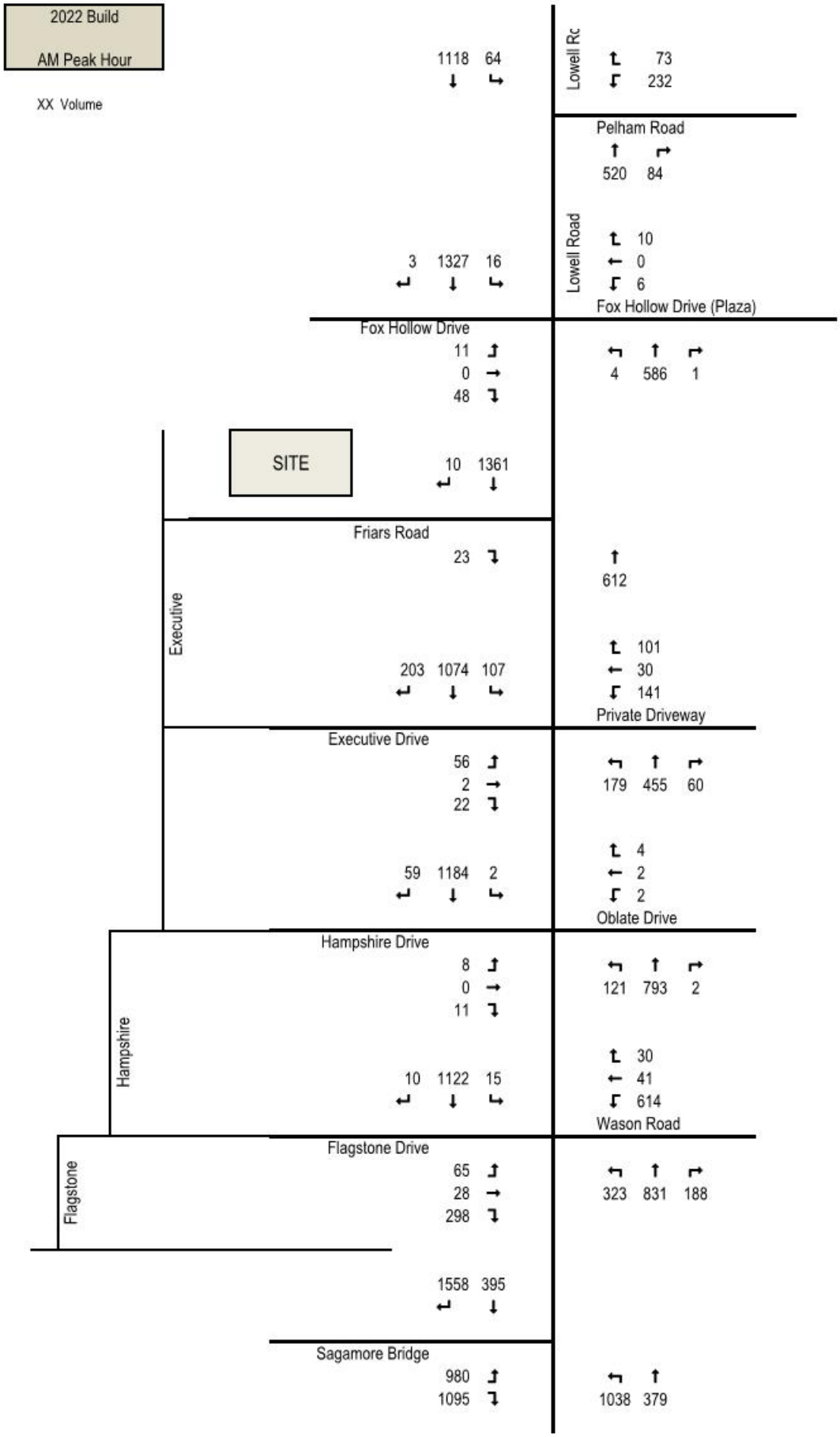

Total Site Trips
PM Peak Hour
XX Trips
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge

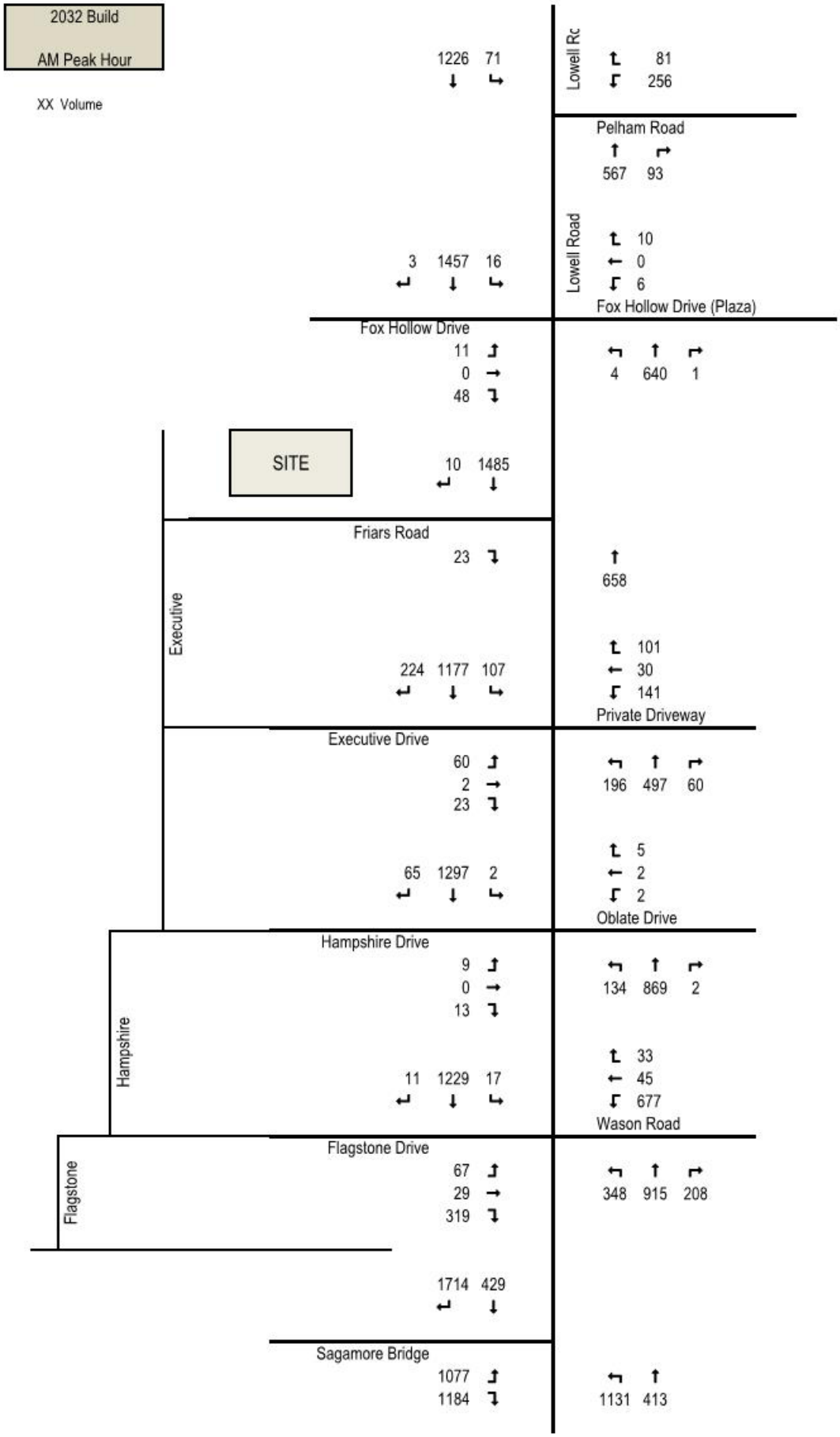

Site Trips by Type
PM Peak Hour
XX Cars
XX Trucks
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge

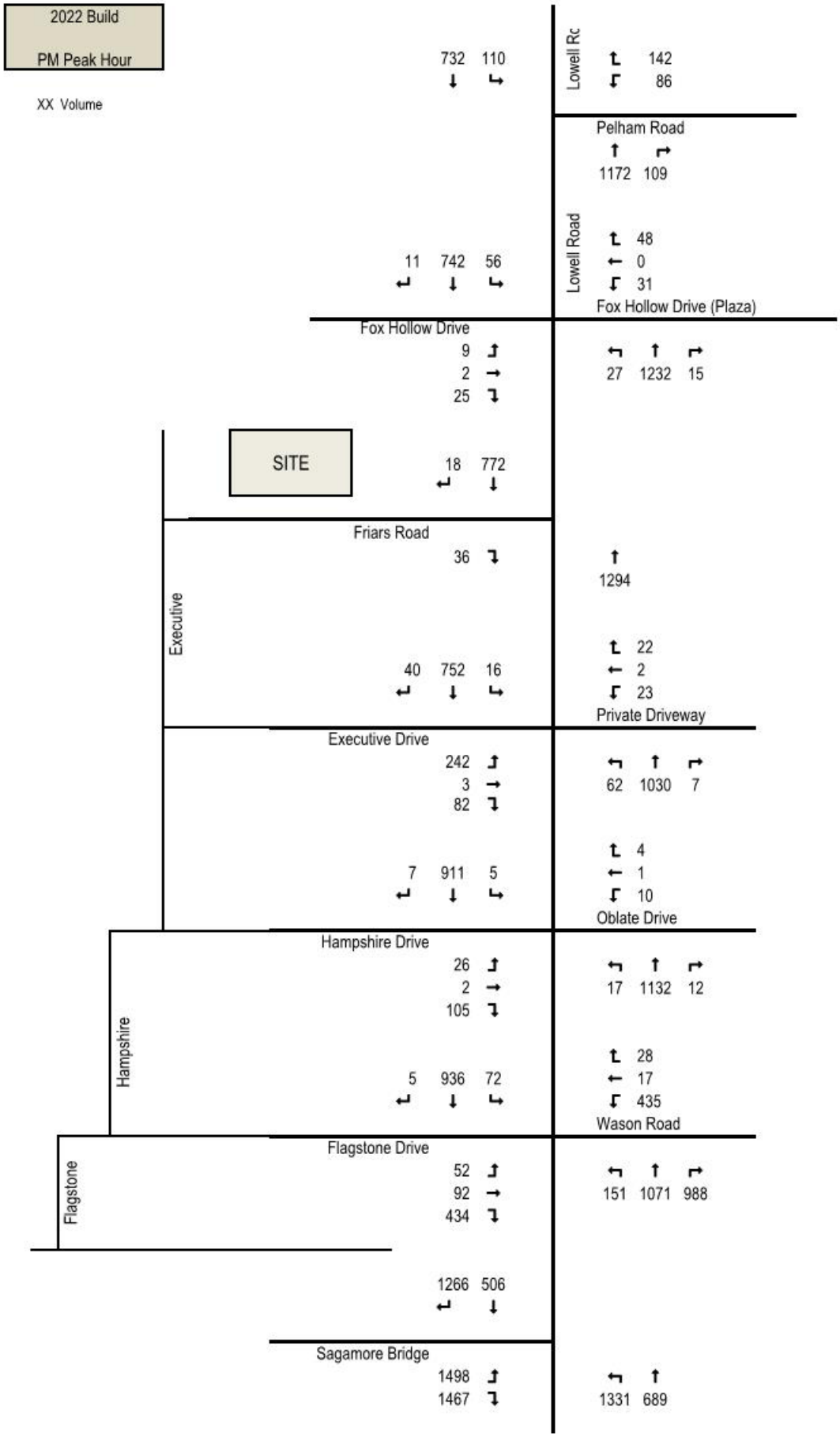

% Trips by Type
PM Peak Hour
XX Cars
XX Trucks
Lowell Rd
Pelham Road
Lowell Road
Fox Hollow Drive (Plaza)
Fox Hollow Drive
SITE
Friars Road
Executive
Private Driveway
Executive Drive
Oblate Drive
Hampshire Drive
Hampshire
Wason Road
Flagstone Drive
Flagstone
Sagamore Bridge

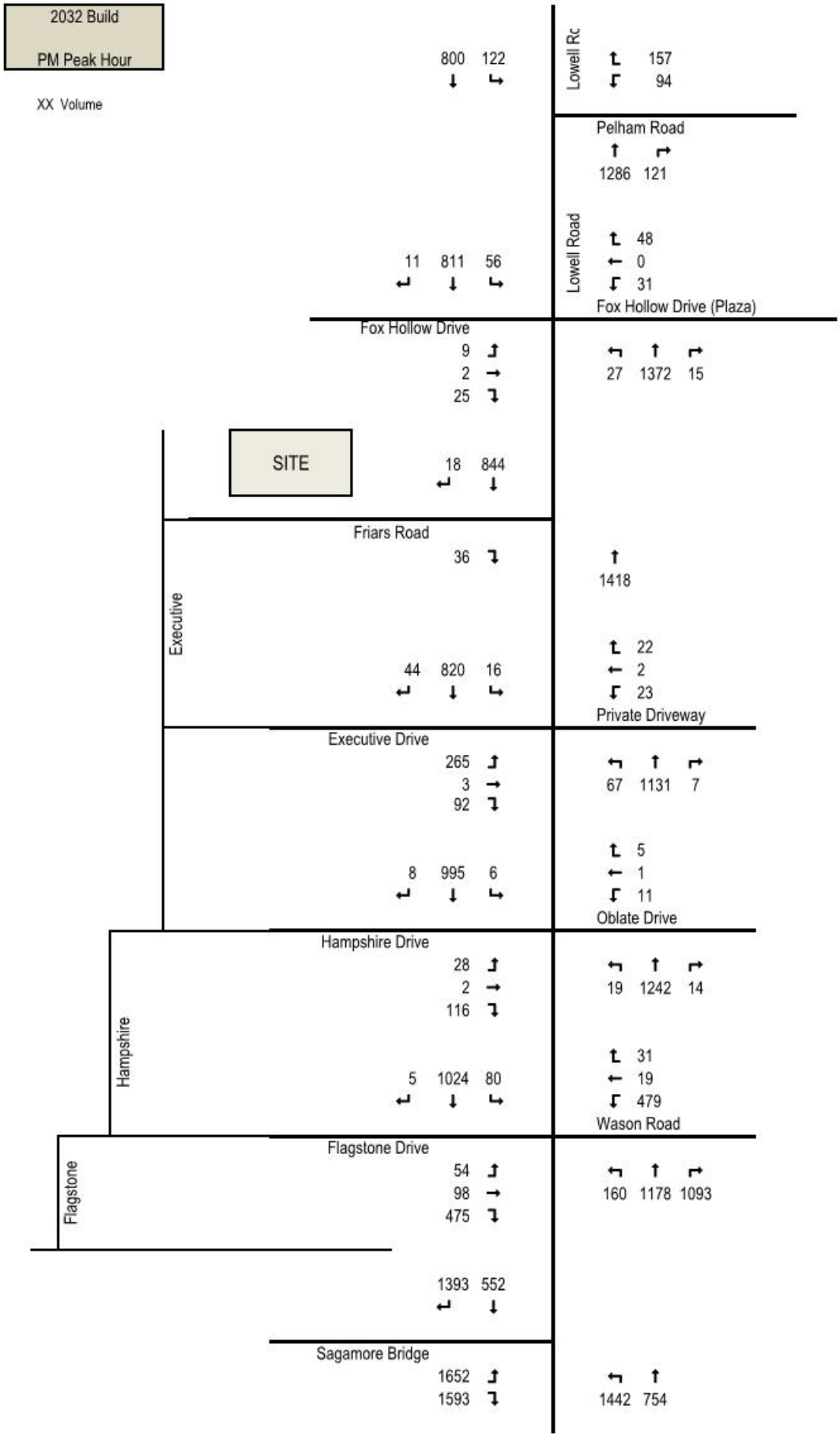
9. Build Volumes:

The trips generated by the proposed development were added to the No-Build volumes through the study area to produce the Build volume diagrams shown on following pages:


2022 Build
AM Peak Hour
XX Volume
1118 64
Lowell Rc
73
232
Pelham Road
520 84
Lowell Road
10
0
6
Fox Hollow Drive (Plaza)
3 1327 16
Fox Hollow Drive
11
0
48
4 586 1
SITE
10 1361
Friars Road
23
612
Executive
101
30
141
203 1074 107
Private Driveway
Executive Drive
56
2
22
179 455 60
4
2
2
59 1184 2
Oblate Drive
Hampshire Drive
8
0
11
121 793 2
Hampshire
30
41
614
10 1122 15
Wason Road
Flagstone Drive
65
28
298
323 831 188
Flagstone
1558 395
Sagamore Bridge
980
1095
1038 379


2032 Build
AM Peak Hour
XX Volume
1226 71
Lowell Rc
81
256
Pelham Road
567 93
Lowell Road
10
0
6
Fox Hollow Drive (Plaza)
3 1457 16
Fox Hollow Drive
11
0
48
4 640 1
SITE
10 1485
Friars Road
23
658
Executive
101
30
141
Private Driveway
224 1177 107
Executive Drive
60
2
23
196 497 60
5
2
2
Oblate Drive
65 1297 2
Hampshire Drive
9
0
13
134 869 2
Hampshire
33
45
677
Wason Road
11 1229 17
Flagstone Drive
67
29
319
348 915 208
Flagstone
1714 429
Sagamore Bridge
1077
1184
1131 413


2022 Build
PM Peak Hour
XX Volume
Lowell Rc
732 110
142
86
Pelham Road
1172 109
Lowell Road
48
11 742 56
0
31
Fox Hollow Drive (Plaza)
Fox Hollow Drive
9
2
25
27 1232 15
SITE
18 772
Friars Road
36
1294
Executive
22
40 752 16
2
23
Private Driveway
Executive Drive
242
3
82
62 1030 7
4
7 911 5
1
10
Oblate Drive
Hampshire Drive
26
2
105
17 1132 12
Hampshire
28
5 936 72
17
435
Wason Road
Flagstone Drive
52
92
434
151 1071 988
Flagstone
1266 506
Sagamore Bridge
1498
1467
1331 689


2032 Build
PM Peak Hour
XX Volume
Lowell Rc
800 122
157
94
Pelham Road
1286 121
Lowell Road
48
0
31
11 811 56
Fox Hollow Drive (Plaza)
Fox Hollow Drive
9
2
25
27 1372 15
SITE
18 844
Friars Road
36
1418
Executive
22
2
23
44 820 16
Private Driveway
Executive Drive
265
3
92
67 1131 7
5
1
11
8 995 6
Oblate Drive
Hampshire Drive
28
2
116
19 1242 14
Hampshire
31
19
479
5 1024 80
Wason Road
Flagstone Drive
Flagstone
54
98
475
160 1178 1093
1393 552
Sagamore Bridge
1652
1593
1442 754

10. Level of Service/Queue Analysis:

Level of Service Analysis:
Level of service (LOS) is a qualitative description of operational conditions within a traffic stream measured in terms of control delay, a function of capacity, degree of saturation, and delay associated with traffic signals and "STOP" signs. Control delay includes initial deceleration, delay approaching a control device, stopped delay, queue move-up time, and acceleration delay from a stopped condition. The relationship between control delay and LOS is shown in the following table.

Level of Service (LOS)	Signalized Control Delay (sec)	Unsignalized Control Delay (sec)
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	Over 80.0	Over 50.0

Study Area.
Analyses were performed for the study area intersections previously described, that is:

- Lowell Road at Pelham Road
- Lowell Road at Fox Hollow Drive
- Lowell Road at Friars Drive (Site Access)
- Lowell Road at Executive Drive/Private Drive
- Lowell Road at Hampshire Drive/Oblate Drive
- Lowell Road at Flagstone Drive/Wason Road
- Lowell Road at Sagamore Bridge

Queue Analysis.
Vehicle queue lengths are determined by the capacity of the movement under study and the volume of traffic processed by the intersection during the analysis period. It is standard practice to report the 95th percentile queue, that is, the queue that will be exceeded no more than 5% of the time during the peak periods.

Methodology.
Trafficware "Synchro" v10.0 software was used to analyze stop controlled intersections (based on HCM 6th) and signalized intersections (based on HCM 2000) within the study area intersections during the weekday AM and PM peak hours.

Volume to capacity (v/c) ratios, Level of Service (LOS), delays and queue results are summarized in the following tables. The tables compare the following conditions:

- *No-Build*, representing conditions HLC build volumes and mitigation improvements adjusted as described above.
- *Build*, calculated by adding the trips from this development to the HLC build volumes
- *Build Mit*, showing proposed mitigation improvements as described in Section 11 of this report.

Table 3a 2022 AM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2022 No-Build				2022 Build				2022 Build Mit			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
9: Lowell Road (3A) at Pelham Road												
AM OVERALL –	**0.88**	**44.7**	**D**	**---**	**0.88**	**45.2**	**D**	**---**	**0.88**	**49.2**	**D**	**---**
WB L	0.70	73.7	E	620	0.70	73.7	E	620	No Timing Mitigation Recommended			
WB R	0.14	48.2	D	114	0.14	48.2	D	114				
NB TR	0.62	29.7	C	649	0.62	29.7	C	652				
SB L	0.66	99.5	F	210	0.66	99.5	F	210				
SB T	0.94	43.2	D	1703	0.94	44.2	D	1718				
8: Lowell Road (3A) at Fox Hollow Drive/Plaza												
AM OVERALL –	**0.89**	**24.1**	**C**	**---**	**0.89**	**24.5**	**C**	**---**	**0.89**	**24.5**	**C**	**---**
EB LT	0.30	86.0	F	40	0.30	86.0	F	40	No Timing Mitigation Recommended			
EB R	0.04	84.0	F	3	0.04	84.0	F	3				
WB LT	0.16	84.8	F	27	0.16	84.8	F	27				
WB R	0.01	74.5	E	0	0.01	74.5	E	0				
NB L	0.44	101.4	F	20	0.44	101.4	F	20				
NB TTR	0.25	5.6	A	212	0.25	5.6	A	213				
SB L	0.42	89.5	F	50	0.42	89.5	F	50				
SB TR	0.94	27.5	C	2198	0.94	28.2	C	2213				
10: Lowell Road (3A) at Friars Drive												
AM OVERALL –		**0.2**	**A**	**---**	**---**	**0.4**	**A**	**---**	**---**	**0.4**	**A**	**---**
EB R	0.11	32.2	D	10	0.17	34.1	D	15				
7: Lowell Road (3A) at Executive Drive/PMA Drive												
AM OVERALL –	**0.82**	**30.0**	**C**	**---**	**0.84**	**32.0**	**C**	**---**	**0.83**	**29.8**	**C**	**---**
EB LT	0.50	34.8	C	82	0.50	35.0	C	84	0.53	37.8	D	84
EB R	0.01	19.0	B	12	0.02	19.1	B	15	0.02	18.7	B	14
WB LT	0.83	54.8	D	227	0.84	56.2	E	227	0.86	62.3	E	227
WB R	0.14	31.5	C	51	0.14	31.6	C	51	0.15	33.6	C	51
NB L	0.99	103.7	F	293	1.08	132.2	F	317	0.85	64.5	E	272
NB TTR	0.31	13.1	B	133	0.31	13.1	B	133	0.30	12.7	B	133
SB L	0.69	50.3	D	172	0.70	50.7	D	172	0.72	55.8	E	172
SB TTR	0.79	21.3	C	433	0.79	21.4	C	438	0.82	24.2	C	481

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

Table 3b 2022 AM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2022 No-Build				2022 Build				2022 Build Mit			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
6: Lowell Road (3A) at Hampshire Drive/Oblate Drive												
AM OVERALL –	**0.67**	**13.3**	**B**	**---**	**0.68**	**13.5**	**B**	**---**	**0.68**	**13.5**	**B**	**---**
EB LT	0.19	44.7	D	22	0.20	44.9	D	22				
EB R	0.01	32.9	C	0	0.01	32.8	C	0				
WB LT	0.15	45.1	D	16	0.15	45.2	D	16				
WB R	0.00	37.0	D	0	0.00	37.1	D	0	No Timing Mitigation Recommended			
NB L	0.62	41.6	D	174	0.63	42.3	D	183				
NB TTR	0.36	5.5	A	204	0.36	5.5	A	207				
SB L	0.15	46.6	D	8	0.15	46.7	D	8				
SB TTR	0.72	14.7	B	447	0.73	15.0	B	454				
5: Lowell Road (3A) at Flagstone Drive/Wason Road												
AM OVERALL –	**0.97**	**48.7**	**D**	**---**	**0.98**	**50.7**	**D**	**---**	**0.98**	**50.7**	**D**	**---**
EB LT	0.94	105.2	F	147	0.94	105.2	F	147				
EB R	0.56	30.3	C	181	0.56	30.3	C	183				
WB L	0.95	68.9	E	382	0.95	68.9	E	382				
WB LT	0.95	69.3	E	386	0.95	69.3	E	386				
WB R	0.02	25.1	C	0	0.02	25.1	C	0	No Timing Mitigation Recommended			
NB L	0.96	82.8	F	327	1.01	94.2	F	339				
NB TT	0.59	20.2	C	200	0.60	20.8	C	206				
NB RR	0.06	0.0	A	0	0.06	0.0	A	0				
SB L	0.29	44.5	D	29	0.29	44.5	D	29				
SB TTR	0.99	56.5	E	349	1.00	59.1	E	355				
4: Lowell Road (3A) at Sagamore Bridge												
AM OVERALL –	**0.92**	**13.5**	**B**	**---**	**0.92**	**13.7**	**B**	**---**	**0.92**	**13.7**	**B**	**---**
EB LL	0.83	32.4	C	337	0.84	32.7	C	349				
EB R	0.70	2.5	A	0	0.70	2.5	A	0				
NB LLL	0.83	24.1	C	231	0.83	24.2	C	231	No Timing Mitigation Recommended			
NB TT	0.22	4.2	A	12	0.23	4.4	A	12				
SB TT	0.79	31.4	C	134	0.82	32.4	C	134				
SB RR	0.61	0.4	A	101	0.61	0.4	A	102				

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

Table 4a 2022 PM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2022 No-Build				2022 Build				2022 Build Mit			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
9: Lowell Road (3A) at Pelham Road												
PM OVERALL –	**0.93**	**54.2**	**D**	**---**	**0.93**	**55.1**	**E**	**---**	**---**			**---**
WB L	0.73	102.1	F	184	0.73	102.1	F	184	No Timing Mitigation Recommended			
WB R	0.13	57.2	E	78	0.13	57.2	E	78				
NB TR	1.06	76.9	E	2191	1.06	78.6	E	2205				
SB L	0.53	78.6	E	384	0.53	78.6	E	384				
SB T	0.55	8.2	A	750	0.55	8.2	A	754				
8: Lowell Road (3A) at Fox Hollow Drive/Plaza												
PM OVERALL –	**0.56**	**18.0**	**B**	**---**	**0.56**	**18.0**	**B**	**---**	**---**			**---**
EB LT	0.20	82.8	F	39	0.20	82.8	F	39	No Timing Mitigation Recommended			
EB R	0.02	81.5	F	0	0.02	81.5	F	0				
WB LT	0.55	88.3	F	80	0.55	88.3	F	80				
WB R	0.04	67.3	E	34	0.04	67.3	E	34				
NB L	0.50	88.5	F	70	0.50	88.5	F	70				
NB TTR	0.50	10.7	B	586	0.50	10.8	B	590				
SB L	0.60	89.4	F	124	0.60	89.4	F	124				
SB TR	0.56	10.8	B	807	0.56	10.8	B	810				
10: Lowell Road (3A) at Friars Drive												
PM OVERALL	**---**	**0.0**	**A**	**---**	**---**	**0.2**	**A**	**---**	**---**			**---**
EB R	0.02	15.2	C	0	0.11	16.3	C	10				
7: Lowell Road (3A) at Executive Drive/PMA Drive												
PM OVERALL –	**0.74**	**20.5**	**C**	**---**	**0.75**	**21.1**	**C**	**---**	**---**			**---**
EB LT	0.83	38.4	D	277	0.86	42.6	D	286	No Timing Mitigation Recommended			
EB R	0.06	11.7	B	21	0.06	11.9	B	21				
WB LT	0.09	19.4	B	33	0.09	19.7	B	33				
WB R	0.02	19.0	B	0	0.02	19.3	B	0				
NB L	0.45	33.1	C	66	0.49	33.6	C	72				
NB TTR	0.66	16.3	B	282	0.65	16.1	B	282				
SB L	0.71	92.0	F	29	0.71	92.3	F	29				
SB TTR	0.59	18.1	B	217	0.61	18.4	B	228				

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

Table 4b 2022 PM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2022 No-Build				2022 Build				2022 Build Mit			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
6: Lowell Road (3A) at Hampshire Drive/Oblate Drive												
PM OVERALL –	**0.56**	**14.7**	**B**	**---**	**0.56**	**14.8**	**B**	**---**	**---**			**---**
EB LT	0.37	32.3	C	47	0.37	32.7	C	47				
EB R	0.08	24.5	C	26	0.08	24.8	C	26				
WB LT	0.22	36.6	D	24	0.22	36.9	D	24				
WB R	0.00	28.3	C	0	0.00	28.6	C	0	No Timing Mitigation			
NB L	0.13	32.0	C	31	0.14	32.4	C	33	Recommended			
NB TTR	0.62	12.4	B	334	0.62	12.3	B	337				
SB L	0.33	40.2	D	16	0.33	40.5	D	16				
SB TTR	0.60	14.8	B	261	0.62	15.0	B	275				
5: Lowell Road (3A) at Flagstone Drive/Wason Road												
PM OVERALL –	**0.86**	**34.8**	**C**	**---**	**0.86**	**35.1**	**D**	**---**	**---**			**---**
EB LT	0.79	67.8	E	188	0.79	67.8	E	188				
EB R	0.82	45.5	D	366	0.81	45.3	D	366				
WB L	0.82	63.0	E	344	0.83	64.4	E	344				
WB LT	0.82	62.1	E	343	0.83	63.4	E	343				
WB R	0.02	34.5	C	0	0.02	34.6	C	0	No Timing Mitigation			
NB L	0.42	57.7	E	139	0.44	57.9	E	145	Recommended			
NB TT	0.73	28.2	C	254	0.73	28.0	C	253				
NB RR	0.44	5.2	A	25	0.44	5.2	A	25				
SB L	0.76	80.4	F	123	0.76	80.4	F	123				
SB TTR	0.69	40.3	D	320	0.71	40.8	D	334				
4: Lowell Road (3A) at Sagamore Bridge												
PM OVERALL –	**1.12**	**40.4**	**D**	**---**	**1.12**	**41.0**	**D**	**---**	**---**			**---**
EB LL	1.07	81.0	F	820	1.08	84.0	F	830				
EB R	0.90	8.4	A	5	0.90	8.4	A	5				
NB LLL	1.05	73.8	E	523	1.05	73.8	E	523	No Timing Mitigation			
NB TT	0.40	14.9	B	227	0.41	14.9	B	227	Recommended			
SB TT	0.94	63.4	E	343	0.95	64.5	E	348				
SB RR	0.49	0.4	A	39	0.51	0.4	A	48				

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

Table 5a 2032 AM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2032 No-Build				2032 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
9: Lowell Road (3A) at Pelham Road								
AM OVERALL –	**0.97**	**63.4**	**E**	**---**	**0.97**	**64.3**	**E**	**---**
WB L	0.71	72.3	E	695	0.71	72.3	E	695
WB R	0.15	46.5	D	129	0.15	46.5	D	129
NB TR	0.69	34.3	C	746	0.70	34.3	C	746
SB L	0.76	115.1	F	233	0.76	115.1	F	233
SB T	1.06	75.9	E	1990	1.06	77.6	E	2008
8: Lowell Road (3A) at Fox Hollow Drive/Plaza								
AM OVERALL –	**0.97**	**38.4**	**D**	**---**	**0.98**	**39.4**	**D**	**---**
EB LT	0.30	86.0	F	40	0.30	86.0	F	40
EB R	0.04	84.0	F	3	0.04	84.0	F	3
WB LT	0.16	84.8	F	27	0.16	84.8	F	27
WB R	0.01	74.5	E	0	0.01	74.5	E	0
NB L	0.44	101.4	F	20	0.44	101.4	F	20
NB TTR	0.27	5.7	A	234	0.27	5.7	A	235
SB L	0.42	89.5	F	50	0.42	89.5	F	50
SB TR	1.03	50.0	D	2526	1.04	51.4	D	2543
10: Lowell Road (3A) at Friars Drive								
AM OVERALL –		**0.3**	**A**	**---**	**---**	**0.4**	**A**	**---**
EB R	0.14	38.8	E	13	0.21	41.8	E	18
7: Lowell Road (3A) at Executive Drive/PMA Drive								
AM OVERALL –	**0.88**	**35.4**	**D**	**---**	**0.89**	**39.2**	**D**	**---**
EB LT	0.58	41.2	D	88	0.58	41.2	D	90
EB R	0.02	21.2	C	13	0.02	21.4	C	16
WB LT	0.87	64.7	E	228	0.87	64.9	E	228
WB R	0.15	33.9	C	51	0.15	34.1	C	51
NB L	1.15	157.5	F	323	1.26	202.1	F	349
NB TTR	0.33	12.8	B	146	0.33	12.8	B	146
SB L	0.73	56.5	E	172	0.73	57.6	E	172
SB TTR	0.83	22.6	C	511	0.83	2.6	C	515

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentil
feet

Table 5b 2032 AM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2032 No-Build				2032 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
6: Lowell Road (3A) at Hampshire Drive/Oblate Drive								
AM OVERALL –	**0.73**	**14.6**	**B**	**---**	**0.73**	**14.9**	**B**	**---**
EB LT	0.21	46.9	D	23	0.21	47.1	D	23
EB R	0.01	34.4	C	0	0.01	34.4	C	0
WB LT	0.15	47.2	D	16	0.15	47.4	D	16
WB R	0.00	39.0	D	0	0.00	39.2	D	0
NB L	0.69	47.4	D	201	0.70	48.0	D	212
NB TTR	0.38	5.6	A	229	0.39	5.6	A	233
SB L	0.14	48.4	D	8	0.14	48.6	D	8
SB TTR	0.78	16.3	B	521	0.79	16.7	B	530
5: Lowell Road (3A) at Flagstone Drive/Wason Road								
AM OVERALL –	**1.06**	**59.1**	**E**	**---**	**1.08**	**61.9**	**E**	**---**
EB LT	0.98	115.1	F	152	0.98	115.1	F	152
EB R	0.67	35.6	D	212	0.68	35.6	D	214
WB L	1.00	80.5	F	422	1.00	80.5	F	422
WB LT	1.00	80.3	F	425	1.00	80.3	F	425
WB R	0.02	24.4	C	0	0.02	24.4	C	0
NB L	1.27	164.3	F	300	1.32	184.8	F	308
NB TT	0.67	17.0	B	294	0.68	17.1	B	295
NB RR	0.07	31.4	C	26	0.07	31.2	C	25
SB L	0.34	45.1	D	33	0.34	45.1	D	33
SB TTR	1.00	56.7	E	379	1.01	59.2	E	385
4: Lowell Road (3A) at Sagamore Bridge								
AM OVERALL –	**1.01**	**18.4**	**B**	**---**	**1.02**	**19.5**	**B**	**---**
EB LL	0.97	51.2	D	461	1.00	57.1	E	479
EB R	0.76	3.4	A	0	0.76	3.4	A	0
NB LLL	0.87	24.6	C	256	0.87	24.6	C	256
NB TT	0.23	4.4	A	17	0.23	4.4	A	17
SB TT	0.80	48.8	D	134	0.80	48.8	D	133
SB RR	0.67	1.4	A	273	0.68	0.4	A	275

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentil
feet

Table 6a 2032 PM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2032 No-Build				2032 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
9: Lowell Road (3A) at Pelham Road								
PM OVERALL –	**1.03**	**84.1**	**F**	**---**	**1.03**	**85.2**	**F**	**---**
WB L	0.76	104.9	F	197	0.76	104.9	F	197
WB R	0.16	55.0	E	100	0.16	55.0	E	100
NB TR	1.20	133.8	F	2523	1.20	136.0	F	2536
SB L	0.52	76.1	E	423	0.52	76.1	E	423
SB T	0.60	9.4	A	884	0.60	9.4	A	888
8: Lowell Road (3A) at Fox Hollow Drive/Plaza								
PM OVERALL –	**0.61**	**18.0**	**B**	**---**	**0.61**	**18.0**	**B**	**---**
EB LT	0.22	83.4	F	40	0.22	83.4	F	40
EB R	0.02	82.1	F	0	0.02	82.1	F	0
WB LT	0.59	93.3	F	81	0.59	93.3	F	81
WB R	0.04	68.6	E	36	0.04	68.6	E	36
NB L	0.50	88.5	F	70	0.50	88.5	F	70
NB TTR	0.55	10.9	B	623	0.55	11.0	B	626
SB L	0.66	96.3	F	134	0.66	96.3	F	134
SB TR	0.61	11.6	B	903	0.61	11.6	B	908
10: Lowell Road (3A) at Friars Drive								
PM OVERALL	**---**	**0.0**	**A**	**---**	**---**	**0.3**	**A**	**---**
EB R	0.02	16.3	C	3	0.12	17.7	C	10
7: Lowell Road (3A) at Executive Drive/PMA Drive								
PM OVERALL –	**0.80**	**23.7**	**C**	**---**	**0.80**	**26.3**	**C**	**---**
EB LT	0.95	62.9	E	339	1.02	84.8	F	349
EB R	0.06	13.1	B	24	0.07	13.5	B	24
WB LT	0.10	21.1	C	36	0.12	22.7	C	36
WB R	0.02	20.6	C	0	0.02	22.1	C	0
NB L	0.49	35.1	D	76	0.46	34.9	C	82
NB TTR	0.68	16.5	B	318	0.65	15.6	B	318
SB L	0.74	107.3	F	31	0.71	95.1	F	31
SB TTR	0.61	18.1	B	240	0.62	18.7	B	251

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentil
feet

Table 6b 2032 PM Peak Hour
Level of Service Analysis Summary

Location/ *Peak Hour*	2032 No-Build				2032 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
6: Lowell Road (3A) at Hampshire Drive/Oblate Drive								
PM OVERALL –	**0.60**	**15.4**	**B**	**---**	**0.60**	**15.4**	**B**	**---**
EB LT	0.41	35.3	D	55	0.42	35.9	D	56
EB R	0.09	26.5	C	29	0.09	26.9	C	29
WB LT	0.26	39.8	D	27	0.27	40.4	D	27
WB R	0.00	30.0	C	0	0.00	30.4	C	0
NB L	0.15	34.3	C	36	0.16	34.8	C	38
NB TTR	0.67	13.3	B	383	0.66	13.1	B	386
SB L	0.19	38.7	D	18	0.19	39.2	D	19
SB TTR	0.62	14.9	B	295	0.64	15.0	B	310
5: Lowell Road (3A) at Flagstone Drive/Wason Road								
PM OVERALL –	**0.93**	**34.5**	**C**	**---**	**0.94**	**34.8**	**C**	**---**
EB LT	0.89	86.2	F	232	0.89	86.2	F	232
EB R	0.89	52.5	D	441	0.89	52.5	D	441
WB L	0.87	67.6	E	382	0.87	67.6	E	382
WB LT	0.86	66.1	E	378	0.86	66.1	E	378
WB R	0.02	33.1	C	0	0.02	33.1	C	0
NB L	0.42	57.5	E	123	0.44	57.6	E	126
NB TT	0.82	19.3	B	162	0.82	19.0	B	161
NB RR	0.53	0.6	A	1	0.53	0.7	A	1
SB L	0.77	80.4	F	155	0.77	80.4	F	155
SB TTR	0.80	45.2	D	349	0.83	46.4	D	363
4: Lowell Road (3A) at Sagamore Bridge								
PM OVERALL –	**1.25**	**58.1**	**E**	**---**	**1.26**	**58.8**	**E**	**---**
EB LL	1.26	161.3	F	992	1.27	165.5	F	1003
EB R	0.98	18.1	B	216	0.98	18.1	B	216
NB LLL	1.04	64.1	E	550	1.04	63.3	E	549
NB TT	0.42	8.8	A	181	0.42	7.6	A	166
SB TT	1.02	72.6	E	358	1.03	74.1	E	365
SB RR	0.55	0.4	A	47	0.56	0.4	A	61

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentil
feet

11. Mitigation:

In addition to the roadway improvements proposed in the HLC study and the VHB CMAQ project described above, preliminary mitigation improvements relative to the impacts of the Friars Drive warehouse have been discussed with Town staff. These include the following:

- Applicant will install a right turn pocket from Lowell Road into Friars Drive. One utility pole will need to be moved to provide as long a taper and deceleration length as practicable.
- An extra inch (1in) of pavement will be applied on top of the current Friars Drive improvements.
- Right turning movements for WB-67 vehicles from Flagstone onto Lowell Road are to be reviewed, taking into account the new (CMAQ) lane on Lowell Road.

For the opening year AM peak hour, a small timing modification is also recommended as it shows improvements to the following intersection and helps return operating conditions to no-build conditions or better.

- Lowell Road at Executive Drive:
    - Add 2 seconds to the NBL (Phase 1), reducing Phase 2 by 2 seconds.

At the Sagamore Bridge interchange, the build conditions of the HLC and CMAQ improvements for the eastbound left turn still show an over-capacity condition (v/c = 1.26). However, analysis shows that the effects of this development on this approach are negligible (v/c = 1.27), and therefore no further mitigation is required.

12. Conclusion:

This study shows that traffic from this development adds between 50 and 55 trips to the roadway network during weekday am and pm peak hours, respectively.

Background traffic along Lowell Road is between 2000-3000 vehicles per hour during these peak hours. This new traffic (approximately 2% of background volume) falls within the normal day-to-day range of traffic variation, and represents little more than expected background growth for the corridor.

Traffic entering and exiting the Sagamore Park have several intersections to choose from, and thus reduce impacts at any single intersection. As the tables above show for all cases, delays and level of service are not significantly affected, and 95th percentile queues are extended by less than one car length even in worst-case pm conditions.

The intersection that carries most project-related traffic is the Sagamore Bridge intersection, where 47 new trips (4 trucks and 43 cars) are added during the pm peak hour. However, 28 of these trips are southbound right turns not subject to signal control, leaving only 19 vehicles added to the signal (throughs and left turns) during the peak hour. In the am peak hour, 43 trips (10 trucks and 33 cars) are added, but only 33 of these trips are added to the signal.

These volumes amount to less than one new vehicle per cycle at the interchange, and multiple lanes are provided for each movement. The results above show that the effect of this development even at the Sagamore Bridge interchange are negligible.

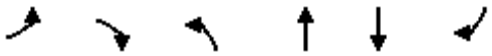
This level of traffic is not expected to materially affect the “Build” traffic conditions associated with the HLC project, and can be accommodated by the mitigation improvements proposed therein. The additional mitigation improvements of this project at the Friars Drive and Flagstone Drive intersections will further improve traffic movements at both ends of the corridor.

Please let me know if you have any questions in regard to these items.

TFMORAN, INC.

Robert Duval, PE
Chief Engineer

APPENDIX G

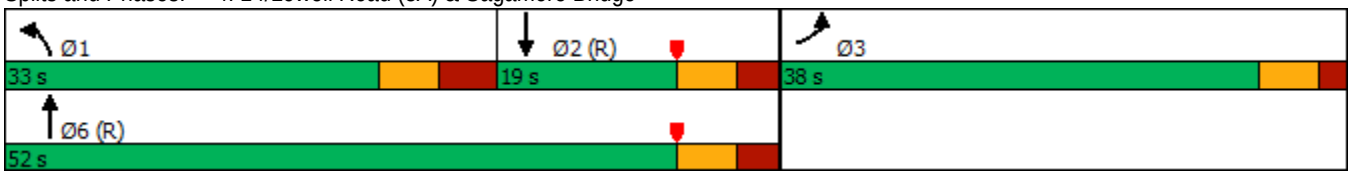


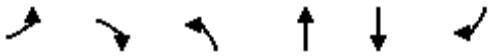
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	954	1095	1038	374	393	1548
Future Volume (vph)	954	1095	1038	374	393	1548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1227
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Adj. Flow (vph)	1015	1165	1128	407	427	1683
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1015	1165	1128	407	427	1683
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	38.0		33.0	52.0	19.0	
Total Split (%)	42.2%		36.7%	57.8%	21.1%	
Maximum Green (s)	32.0		25.0	45.0	12.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	30.2	90.0	25.0	46.8	13.8	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
v/c Ratio	0.83	0.70	0.83	0.22	0.79	0.61
Control Delay	33.9	2.5	25.7	4.4	34.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	2.5	25.7	4.4	34.1	4.1
LOS	C	A	C	A	C	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	17.1			20.0	10.2	
Approach LOS	B			C	B	
Queue Length 50th (ft)	261	0	221	16	121	92
Queue Length 95th (ft)	337	0	231	12	m134	m101
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1302	1656	1377	1839	540	2760
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	0.78	0.70	0.82	0.22	0.79	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: 14/Lowell Road (3A) & Sagamore Bridge

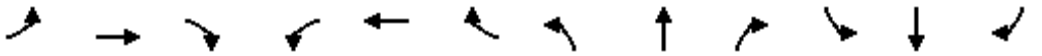




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	954	1095	1038	374	393	1548
Future Volume (vph)	954	1095	1038	374	393	1548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1015	1165	1128	407	427	1683
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1015	1165	1128	407	427	1683
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	30.2	90.0	25.0	46.8	13.8	90.0
Effective Green, g (s)	30.2	90.0	25.0	46.8	13.8	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1228	1656	1359	1840	542	2760
v/s Ratio Prot	0.28		0.23	0.11	0.12	
v/s Ratio Perm		c0.70				0.61
v/c Ratio	0.83	0.70	0.83	0.22	0.79	0.61
Uniform Delay, d1	27.5	0.0	30.5	11.7	36.7	0.0
Progression Factor	1.00	1.00	0.66	0.34	0.73	1.00
Incremental Delay, d2	4.9	2.5	4.1	0.2	4.4	0.4
Delay (s)	32.4	2.5	24.1	4.2	31.4	0.4
Level of Service	C	A	C	A	C	A
Approach Delay (s)	16.4			18.9	6.7	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

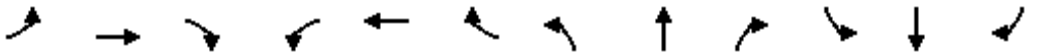


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	297	614	41	30	309	814	188	15	1110	10
Future Volume (vph)	65	28	297	614	41	30	309	814	188	15	1110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Flt Permitted		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			182			198		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Adj. Flow (vph)	80	35	367	653	44	32	325	857	198	17	1276	11
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	115	367	346	351	32	325	857	198	17	1287	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	12.0	12.0	23.0	26.0	26.0	11.0	23.0	41.0	26.0	11.0	29.0	
Total Split (%)	13.3%	13.3%	25.6%	28.9%	28.9%	12.2%	25.6%	45.6%	28.9%	12.2%	32.2%	
Maximum Green (s)	6.0	6.0	17.0	20.0	20.0	5.0	17.0	35.0	20.0	5.0	23.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		6.0	29.0	20.0	20.0	25.0	17.0	39.4	65.4	5.0	23.0	
Actuated g/C Ratio		0.07	0.32	0.22	0.22	0.28	0.19	0.44	0.73	0.06	0.26	
v/c Ratio		0.94	0.63	0.95	0.95	0.06	0.96	0.55	0.10	0.18	0.99	
Control Delay		112.3	23.5	72.8	73.2	0.2	84.8	19.4	0.1	44.9	57.5	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		112.3	23.5	72.8	73.2	0.2	84.8	19.4	0.1	44.9	57.5	
LOS		F	C	E	E	A	F	B	A	D	E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		44.7			69.8			32.0			57.3	
Approach LOS		D			E			C			E	
Queue Length 50th (ft)		66	122	205	208	0	203	127	0	9	267	
Queue Length 95th (ft)		#147	181	#382	#386	0	m#327	200	m0	29	#349	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		122	583	364	368	548	337	1549	2079	97	1298	
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		0.94	0.63	0.95	0.95	0.06	0.96	0.55	0.10	0.18	0.99	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 48 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 49.1		Intersection LOS: D	
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 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.			

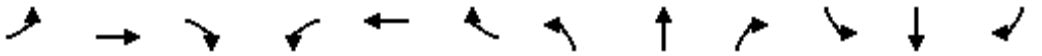
Splits and Phases: 5: Lowell Road (3A) & Flagstone Drive/Wason Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	297	614	41	30	309	814	188	15	1110	10
Future Volume (vph)	65	28	297	614	41	30	309	814	188	15	1110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	80	35	367	653	44	32	325	857	198	17	1276	11
RTOR Reduction (vph)	0	0	81	0	0	24	0	0	73	0	1	0
Lane Group Flow (vph)	0	115	286	346	351	8	325	857	125	17	1286	0
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Effective Green, g (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Actuated g/C Ratio		0.07	0.26	0.22	0.22	0.26	0.19	0.41	0.63	0.03	0.26	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		122	510	364	368	383	337	1454	1950	58	1297	
v/s Ratio Prot		c0.06	0.11	0.21	c0.21	0.00	c0.18	0.24	0.01	0.01	c0.25	
v/s Ratio Perm			0.07			0.00			0.03			
v/c Ratio		0.94	0.56	0.95	0.95	0.02	0.96	0.59	0.06	0.29	0.99	
Uniform Delay, d1		41.8	29.1	34.5	34.5	25.1	36.2	20.6	6.3	42.5	33.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.35	0.91	0.01	1.00	1.00	
Incremental Delay, d2		63.4	1.1	34.4	34.8	0.0	34.0	1.4	0.0	2.0	23.1	
Delay (s)		105.2	30.3	68.9	69.3	25.1	82.8	20.2	0.0	44.5	56.5	
Level of Service		F	C	E	E	C	F	C	A	D	E	
Approach Delay (s)		48.1			67.2			32.0			56.3	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	48.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



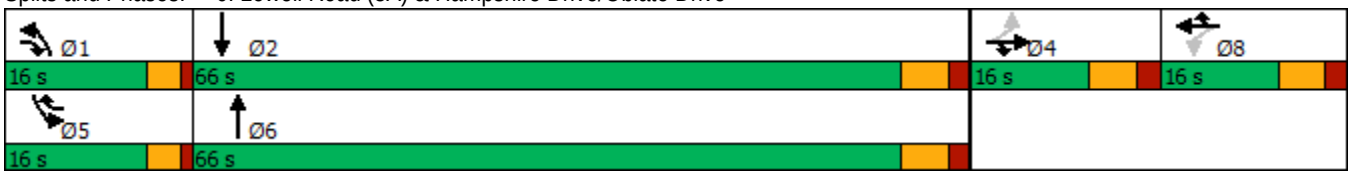
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	116	781	2	2	1172	59
Future Volume (vph)	8	0	11	2	2	4	116	781	2	2	1172	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850					0.993	
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1719	1455	0	1916	1669	1752	3505	0	1745	3480	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1810	1455	0	1963	1669	1752	3505	0	1745	3480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			86					7	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Adj. Flow (vph)	10	0	14	3	3	5	129	868	2	2	1412	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	14	0	6	5	129	870	0	2	1483	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		7.4	11.4		6.5	9.1	10.8	68.1		5.1	49.4	
Actuated g/C Ratio		0.09	0.14		0.08	0.11	0.14	0.86		0.06	0.62	
v/c Ratio		0.06	0.05		0.04	0.02	0.54	0.29		0.02	0.68	
Control Delay		44.4	0.4		46.4	0.2	48.0	5.0		48.5	14.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		44.4	0.4		46.4	0.2	48.0	5.0		48.5	14.6	
LOS		D	A		D	A	D	A		D	B	

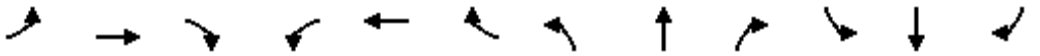
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			25.4			10.6			14.7	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		4	0		2	0	47	0		1	146	
Queue Length 95th (ft)		22	0		16	0	#174	204		8	447	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		252	326		273	364	293	3016		291	2780	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.04	0.04		0.02	0.01	0.44	0.29		0.01	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 79.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	116	781	2	2	1172	59
Future Volume (vph)	8	0	11	2	2	4	116	781	2	2	1172	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1455		1915	1669	1752	3504		1745	3480	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1455		1963	1669	1752	3504		1745	3480	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	10	0	14	2	2	5	129	868	2	2	1412	71
RTOR Reduction (vph)	0	0	12	0	0	5	0	0	0	0	3	0
Lane Group Flow (vph)	0	10	2	0	6	0	129	870	0	2	1480	0
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		2.6	13.4		1.9	8.6	10.8	63.2		0.7	53.1	
Effective Green, g (s)		2.6	13.4		1.9	8.6	10.8	63.2		0.7	53.1	
Actuated g/C Ratio		0.03	0.15		0.02	0.10	0.12	0.70		0.01	0.59	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		52	215		41	158	209	2449		13	2044	
v/s Ratio Prot			0.00			0.00	c0.07	0.25		0.00	c0.43	
v/s Ratio Perm		c0.01			c0.00							
v/c Ratio		0.19	0.01		0.15	0.00	0.62	0.36		0.15	0.72	
Uniform Delay, d1		42.9	32.8		43.5	37.0	37.8	5.4		44.6	13.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.8	0.0		1.6	0.0	3.8	0.1		2.0	1.3	
Delay (s)		44.7	32.9		45.1	37.0	41.6	5.5		46.6	14.7	
Level of Service		D	C		D	D	D	A		D	B	
Approach Delay (s)		37.8			41.4			10.2			14.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

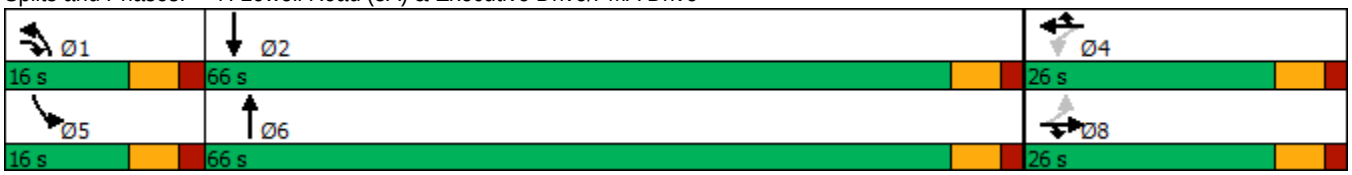
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	2	18	141	30	101	167	455	60	107	1066	203
Future Volume (vph)	54	2	18	141	30	101	167	455	60	107	1066	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.983			0.976	
Flt Protected		0.954			0.961		0.950			0.950		
Satd. Flow (prot)	0	1572	1558	0	1811	1620	1711	3416	0	1728	3454	0
Flt Permitted		0.452			0.715		0.950			0.950		
Satd. Flow (perm)	0	745	1558	0	1347	1620	1711	3416	0	1728	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			101		21			33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	12%	0%	14%	1%	0%	3%	2%	4%	3%	1%	2%	2%
Adj. Flow (vph)	68	3	23	176	38	126	184	500	66	118	1171	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	23	0	214	126	184	566	0	118	1394	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		17.9	34.2		17.9	17.9	10.2	48.4		9.2	47.4	
Actuated g/C Ratio		0.19	0.36		0.19	0.19	0.11	0.52		0.10	0.50	
v/c Ratio		0.50	0.04		0.84	0.32	0.99	0.32		0.70	0.79	
Control Delay		50.7	6.9		65.9	13.8	110.9	13.2		66.3	22.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		50.7	6.9		65.9	13.8	110.9	13.2		66.3	22.3	
LOS		D	A		E	B	F	B		E	C	

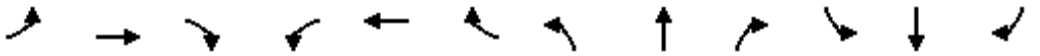
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		40.0			46.6			37.2			25.8	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)		39	0		125	13	~123	99		71	348	
Queue Length 95th (ft)		82	12		#227	51	#293	133		#172	433	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		161	575		292	431	185	2234		187	2263	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.44	0.04		0.73	0.29	0.99	0.25		0.63	0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 93.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 76.2%		ICU Level of Service D	
Analysis Period (min) 15			

~ 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: 7: Lowell Road (3A) & Executive Drive/PMA Drive

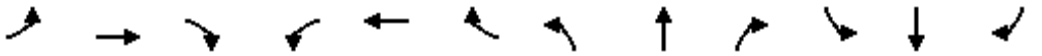




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	2	18	141	30	101	167	455	60	107	1066	203
Future Volume (vph)	54	2	18	141	30	101	167	455	60	107	1066	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1572	1558		1810	1620	1711	3414		1728	3454	
Flt Permitted		0.45	1.00		0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		745	1558		1348	1620	1711	3414		1728	3454	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	68	2	22	176	38	126	184	500	66	118	1171	223
RTOR Reduction (vph)	0	0	15	0	0	82	0	10	0	0	16	0
Lane Group Flow (vph)	0	71	8	0	214	44	184	556	0	118	1378	0
Heavy Vehicles (%)	12%	0%	14%	1%	0%	3%	2%	4%	3%	1%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		17.9	34.1		17.9	17.9	10.2	48.4		9.2	47.4	
Effective Green, g (s)		17.9	34.1		17.9	17.9	10.2	48.4		9.2	47.4	
Actuated g/C Ratio		0.19	0.36		0.19	0.19	0.11	0.52		0.10	0.51	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		142	568		258	310	186	1767		170	1751	
v/s Ratio Prot			0.01			0.03	c0.11	0.16		0.07	c0.40	
v/s Ratio Perm		0.10			c0.16							
v/c Ratio		0.50	0.01		0.83	0.14	0.99	0.31		0.69	0.79	
Uniform Delay, d1		33.8	19.0		36.3	31.4	41.6	13.0		40.8	18.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.0		18.5	0.1	62.1	0.1		9.5	2.4	
Delay (s)		34.8	19.0		54.8	31.5	103.7	13.1		50.3	21.3	
Level of Service		C	B		D	C	F	B		D	C	
Approach Delay (s)		30.9			46.2			35.3			23.6	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



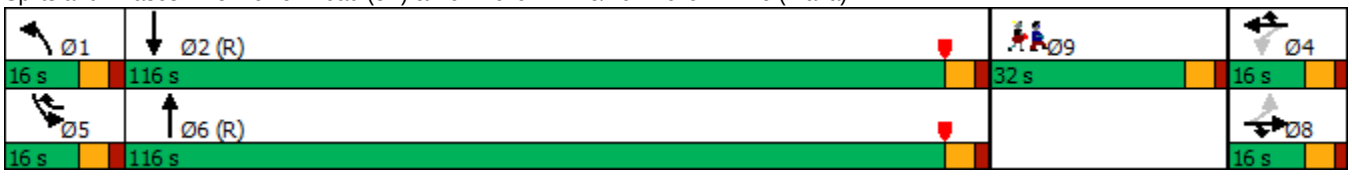
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	584	1	16	1321	3
Future Volume (vph)	11	0	48	6	0	10	4	584	1	16	1321	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1719	1583	0	1865	1669	1745	3356	0	1805	1863	0
Flt Permitted		0.752			0.748		0.950			0.950		
Satd. Flow (perm)	0	1361	1583	0	1469	1669	1745	3356	0	1805	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			55						
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Adj. Flow (vph)	14	0	60	8	0	13	4	642	1	17	1391	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	60	0	8	13	4	643	0	17	1394	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		6.3	6.3		6.3	18.3	5.0	147.7		6.0	153.1	
Actuated g/C Ratio		0.04	0.04		0.04	0.10	0.03	0.82		0.03	0.85	
v/c Ratio		0.30	0.42		0.16	0.06	0.08	0.23		0.28	0.88	
Control Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	18.9	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	16.9	
Total Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	35.8	
LOS		F	B		F	A	F	A		F	D	
Approach Delay		29.0			34.7			6.3			36.5	
Approach LOS		C			C			A			D	
Queue Length 50th (ft)		17	0		9	0	5	67		20	456	
Queue Length 95th (ft)		40	3		27	0	20	212		50	#2198	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		75	173		81	234	96	2753		100	1585	
Starvation Cap Reductn		0	0		0	0	0	0		0	221	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.19	0.35		0.10	0.06	0.04	0.23		0.17	1.02	

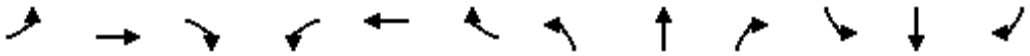
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 93.0%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	584	1	16	1321	3
Future Volume (vph)	11	0	48	6	0	10	4	584	1	16	1321	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	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	
Satd. Flow (prot)		1719	1583		1865	1669	1745	3355		1805	1862	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1362	1583		1469	1669	1745	3355		1805	1862	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	14	0	60	8	0	12	4	642	1	17	1391	3
RTOR Reduction (vph)	0	0	58	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	8	1	4	643	0	17	1394	0
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Effective Green, g (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Actuated g/C Ratio		0.03	0.03		0.03	0.09	0.01	0.78		0.02	0.80	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		47	55		51	151	9	2618		40	1484	
v/s Ratio Prot			0.00			0.00	0.00	0.19		c0.01	c0.75	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.30	0.04		0.16	0.01	0.44	0.25		0.42	0.94	
Uniform Delay, d1		84.7	83.9		84.3	74.5	89.2	5.4		86.9	14.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3	0.1		0.5	0.0	12.2	0.2		2.6	12.8	
Delay (s)		86.0	84.0		84.8	74.5	101.4	5.6		89.5	27.5	
Level of Service		F	F		F	E	F	A		F	C	
Approach Delay (s)		84.4			78.4			6.2			28.3	
Approach LOS		F			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	232	73	518	84	64	1112	
Future Volume (vph)	232	73	518	84	64	1112	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.981				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1787	1524	1839	0	1719	1863	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1524	1839	0	1719	1863	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29	7				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.96	
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%	
Adj. Flow (vph)	264	83	563	91	67	1158	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	264	83	654	0	67	1158	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	40.3	57.6	113.4		11.2	130.7	
Actuated g/C Ratio	0.21	0.30	0.60		0.06	0.69	
v/c Ratio	0.70	0.17	0.59		0.66	0.90	
Control Delay	77.6	36.4	26.4		111.9	35.5	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	2.8		0.0	0.0	
Total Delay	77.6	36.4	29.2		111.9	35.5	
LOS	E	D	C		F	D	
Approach Delay	67.7		29.2			39.6	
Approach LOS	E		C			D	
Queue Length 50th (ft)	308	48	468		82	1002	
Queue Length 95th (ft)	#620	114	649		#210	#1703	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	379	482	1100		101	1281	
Starvation Cap Reductn	0	0	323		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.17	0.84		0.66	0.90	

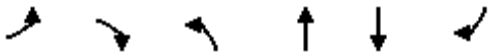
Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 41.0		Intersection LOS: D	
Intersection Capacity Utilization 81.4%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	232	73	518	84	64	1112
Future Volume (vph)	232	73	518	84	64	1112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1524	1840		1719	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1524	1840		1719	1863
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.96
Adj. Flow (vph)	264	83	563	91	67	1158
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	264	63	651	0	67	1158
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	40.3	57.5	108.7		11.2	125.9
Effective Green, g (s)	40.3	57.5	108.7		11.2	125.9
Actuated g/C Ratio	0.21	0.30	0.57		0.06	0.66
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	379	461	1052		101	1234
v/s Ratio Prot	c0.15	0.04	0.35		0.04	c0.62
v/s Ratio Perm						
v/c Ratio	0.70	0.14	0.62		0.66	0.94
Uniform Delay, d1	69.2	48.2	26.9		87.6	28.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.5	0.0	2.7		12.0	14.6
Delay (s)	73.7	48.2	29.7		99.5	43.2
Level of Service	E	D	C		F	D
Approach Delay (s)	67.6		29.7			46.2
Approach LOS	E		C			D

Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	15	0	610	1361	4
Future Volume (vph)	0	15	0	610	1361	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1827	1863	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1827	1863	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%
Adj. Flow (vph)	0	17	0	678	1512	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	17	0	678	1512	4
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	15	0	610	1361	4
Future Vol, veh/h	0	15	0	610	1361	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	2	0
Mvmt Flow	0	17	0	678	1512	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1512	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	149	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	149	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	149	-	-
HCM Lane V/C Ratio	-	0.112	-	-
HCM Control Delay (s)	-	32.2	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	2	0	1	849	0	272	0	487	509	12
Future Volume (vph)	2	0	2	0	1	849	0	272	0	487	509	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		50	100		0	200		300	775		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.932			0.850	0.850					0.998	
Flt Protected		0.976									0.976	
Satd. Flow (prot)	0	1385	0	0	1504	1504	0	3574	0	0	3465	0
Flt Permitted		0.976									0.976	
Satd. Flow (perm)	0	1385	0	0	1504	1504	0	3574	0	0	3465	0
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		591			645			758			1733	
Travel Time (s)		13.4			12.6			14.8			33.8	
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.80	0.80	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	33%	0%	0%	2%	0%	1%	0%	2%	1%	0%
Adj. Flow (vph)	3	0	3	0	1	987	0	340	0	529	553	13
Shared Lane Traffic (%)						50%						
Lane Group Flow (vph)	0	6	0	0	495	493	0	340	0	0	1095	0
Sign Control		Yield			Yield			Yield			Yield	

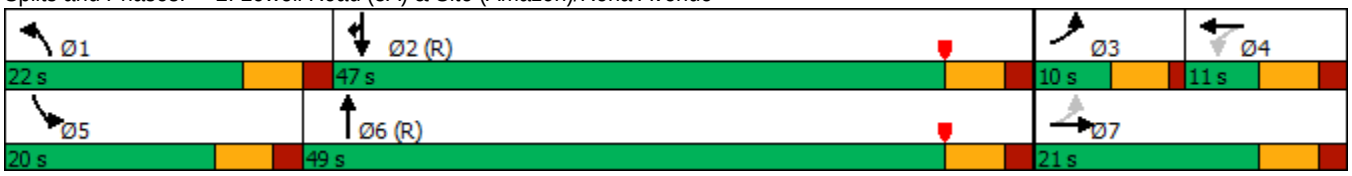
Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 63.7%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	0	25	1	1	33	43	1126	2	7	987	241
Future Volume (vph)	156	0	25	1	1	33	43	1126	2	7	987	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	13	13	13	10	12	12	12	12	12
Storage Length (ft)	0		50	0		0	300		0	350		0
Storage Lanes	2		0	0		0	1		0	1		1
Taper Length (ft)	25			25			75			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.850			0.872							0.850
Flt Protected	0.950				0.999		0.950			0.950		
Satd. Flow (prot)	2971	1133	0	0	1659	0	1685	3538	0	1570	3539	1524
Flt Permitted	0.529				0.990		0.950			0.950		
Satd. Flow (perm)	1654	1133	0	0	1644	0	1685	3538	0	1570	3539	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		316			39							254
Link Speed (mph)		15			30			35			35	
Link Distance (ft)		510			557			1733			980	
Travel Time (s)		23.2			12.7			33.8			19.1	
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.85	0.85	0.85	0.95	0.95	0.95
Heavy Vehicles (%)	10%	0%	33%	9%	0%	3%	0%	2%	20%	15%	2%	6%
Adj. Flow (vph)	195	0	31	1	1	39	51	1325	2	7	1039	254
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	31	0	0	41	0	51	1327	0	7	1039	254
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases	3	7			4		1	6		5	2	2
Permitted Phases	7			4								
Detector Phase	3	7		4	4		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	10.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	16.0
Total Split (s)	10.0	21.0		11.0	11.0		22.0	49.0		20.0	47.0	47.0
Total Split (%)	11.1%	23.3%		12.2%	12.2%		24.4%	54.4%		22.2%	52.2%	52.2%
Maximum Green (s)	5.0	15.0		5.0	5.0		16.0	43.0		14.0	41.0	41.0
Yellow Time (s)	4.0	4.0		4.0	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	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	14.3	13.3			5.6		9.1	61.9		7.0	54.8	54.8
Actuated g/C Ratio	0.16	0.15			0.06		0.10	0.69		0.08	0.61	0.61
v/c Ratio	0.52	0.07			0.30		0.30	0.55		0.06	0.48	0.25
Control Delay	38.8	0.3			20.5		41.3	9.6		37.6	12.0	1.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.8	0.3			20.5		41.3	9.6		37.6	12.0	1.5
LOS	D	A			C		D	A		D	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		33.5			20.5			10.7			10.1	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	46	0			1		27	202		4	98	0
Queue Length 95th (ft)	72	0			30		57	314		m10	131	12
Internal Link Dist (ft)		430			477			1653			900	
Turn Bay Length (ft)							300			350		
Base Capacity (vph)	375	461			138		299	2433		244	2155	1027
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.52	0.07			0.30		0.17	0.55		0.03	0.48	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 53 (59%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 56.9%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Lowell Road (3A) & Site (Amazon)/Rena Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	0	25	1	1	33	43	1126	2	7	987	241
Future Volume (vph)	156	0	25	1	1	33	43	1126	2	7	987	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	13	13	13	10	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.85			0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2971	1133			1658		1685	3537		1570	3539	1524
Flt Permitted	0.53	1.00			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1653	1133			1643		1685	3537		1570	3539	1524
Peak-hour factor, PHF	0.80	0.80	0.80	0.85	0.85	0.85	0.85	0.85	0.85	0.95	0.95	0.95
Adj. Flow (vph)	195	0	31	1	1	39	51	1325	2	7	1039	254
RTOR Reduction (vph)	0	26	0	0	38	0	0	0	0	0	0	113
Lane Group Flow (vph)	195	5	0	0	3	0	51	1327	0	7	1039	141
Heavy Vehicles (%)	10%	0%	33%	9%	0%	3%	0%	2%	20%	15%	2%	6%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases	3	7			4		1	6		5	2	2
Permitted Phases	7			4								
Actuated Green, G (s)	15.7	15.7			3.0		6.3	54.7		1.6	50.0	50.0
Effective Green, g (s)	15.7	15.7			3.0		6.3	54.7		1.6	50.0	50.0
Actuated g/C Ratio	0.17	0.17			0.03		0.07	0.61		0.02	0.56	0.56
Clearance Time (s)	5.0	6.0			6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	401	197			54		117	2149		27	1966	846
v/s Ratio Prot	c0.04	0.00					c0.03	c0.38		0.00	0.29	0.09
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.49	0.03			0.06		0.44	0.62		0.26	0.53	0.17
Uniform Delay, d1	32.9	30.8			42.1		40.1	11.1		43.6	12.6	9.8
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.96	0.92	0.56
Incremental Delay, d2	1.3	0.1			0.6		3.5	1.3		6.4	0.9	0.4
Delay (s)	34.2	30.9			42.8		43.7	12.4		48.3	12.5	5.9
Level of Service	C	C			D		D	B		D	B	A
Approach Delay (s)		33.7			42.8			13.6			11.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

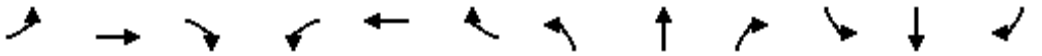
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	4	59	15	5	71	78	1215	27	85	1152	164
Future Volume (vph)	131	4	59	15	5	71	78	1215	27	85	1152	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	175		175	150		200	350		175	350		400
Storage Lanes	2		1	2		1	2		0	2		1
Taper Length (ft)	25			75			125			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.91	0.91	0.97	0.91	1.00
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3213	1852	1568	3502	1900	1589	3467	5022	0	3433	5085	1482
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3213	1852	1568	3502	1900	1589	3467	5022	0	3433	5085	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109		5				171
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		401			449			980			1189	
Travel Time (s)		9.1			10.2			19.1			27.0	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.87	0.87	0.87	0.96	0.96	0.96
Heavy Vehicles (%)	9%	6%	3%	0%	0%	5%	1%	3%	2%	2%	2%	9%
Adj. Flow (vph)	141	4	63	17	6	81	90	1397	31	89	1200	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	141	4	63	17	6	81	90	1428	0	89	1200	171
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4	4 1	3	8	8 5	1	6		5	2	2 7
Permitted Phases												
Detector Phase	7	4	4 1	3	8	8 5	1	6		5	2	2 7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	14.0	15.0		14.0	15.0		15.0	46.0		15.0	46.0	
Total Split (%)	15.6%	16.7%		15.6%	16.7%		16.7%	51.1%		16.7%	51.1%	
Maximum Green (s)	8.0	9.0		8.0	9.0		9.0	40.0		9.0	40.0	
Yellow Time (s)	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	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	6.0		4.0	6.0	
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Act Effct Green (s)	7.9	13.1	27.6	7.0	7.1	19.0	8.5	47.6		8.5	47.6	62.7
Actuated g/C Ratio	0.09	0.15	0.31	0.08	0.08	0.21	0.09	0.53		0.09	0.53	0.70
v/c Ratio	0.50	0.01	0.11	0.06	0.04	0.19	0.28	0.54		0.28	0.45	0.16
Control Delay	45.6	36.2	1.8	38.7	38.4	3.9	44.9	13.3		47.3	11.7	0.5
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	45.6	36.2	1.8	38.7	38.4	3.9	44.9	13.3		47.3	11.7	0.5
LOS	D	D	A	D	D	A	D	B		D	B	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		32.2			11.6			15.1			12.6	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)	40	2	0	4	3	0	28	142		25	111	0
Queue Length 95th (ft)	70	12	9	14	14	19	50	137		m35	241	m0
Internal Link Dist (ft)		321			369			900			1109	
Turn Bay Length (ft)	175		175	150		200	350			350		400
Base Capacity (vph)	285	280	517	311	190	379	354	2657		351	2688	1067
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	0.49	0.01	0.12	0.05	0.03	0.21	0.25	0.54		0.25	0.45	0.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 53 (59%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 15.0		Intersection LOS: B	
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

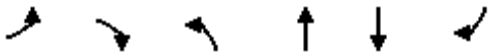
Splits and Phases: 3: Lowell Road (3A) & Sam's Club Driveway/Walmart Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	4	59	15	5	71	78	1215	27	85	1152	164
Future Volume (vph)	131	4	59	15	5	71	78	1215	27	85	1152	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	13	12	12	12	13	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.91		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		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	1.00
Satd. Flow (prot)	3213	1852	1568	3502	1900	1589	3467	5021		3433	5085	1482
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3213	1852	1568	3502	1900	1589	3467	5021		3433	5085	1482
Peak-hour factor, PHF	0.93	0.93	0.93	0.88	0.88	0.88	0.87	0.87	0.87	0.96	0.96	0.96
Adj. Flow (vph)	141	4	63	17	6	81	90	1397	31	89	1200	171
RTOR Reduction (vph)	0	0	45	0	0	62	0	3	0	0	0	63
Lane Group Flow (vph)	141	4	18	17	6	19	90	1425	0	89	1200	108
Heavy Vehicles (%)	9%	6%	3%	0%	0%	5%	1%	3%	2%	2%	2%	9%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4	4 1	3	8	8 5	1	6		5	2	2 7
Permitted Phases												
Actuated Green, G (s)	7.9	13.1	26.2	3.0	8.2	21.3	7.1	42.8		7.1	42.8	56.7
Effective Green, g (s)	7.9	13.1	26.2	3.0	8.2	21.3	7.1	42.8		7.1	42.8	56.7
Actuated g/C Ratio	0.09	0.15	0.29	0.03	0.09	0.24	0.08	0.48		0.08	0.48	0.63
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	282	269	456	116	173	376	273	2387		270	2418	933
v/s Ratio Prot	c0.04	0.00	c0.01	0.00	0.00	c0.01	c0.03	c0.28		0.03	0.24	0.07
v/s Ratio Perm												
v/c Ratio	0.50	0.01	0.04	0.15	0.03	0.05	0.33	0.60		0.33	0.50	0.12
Uniform Delay, d1	39.2	32.9	22.9	42.3	37.3	26.5	39.2	17.3		39.2	16.2	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.14	0.78		1.22	0.75	0.20
Incremental Delay, d2	1.9	0.0	0.0	0.8	0.1	0.1	0.8	0.9		0.6	0.5	0.0
Delay (s)	41.1	33.0	22.9	43.1	37.4	26.6	45.7	14.5		48.3	12.7	1.4
Level of Service	D	C	C	D	D	C	D	B		D	B	A
Approach Delay (s)		35.4			29.9			16.3			13.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

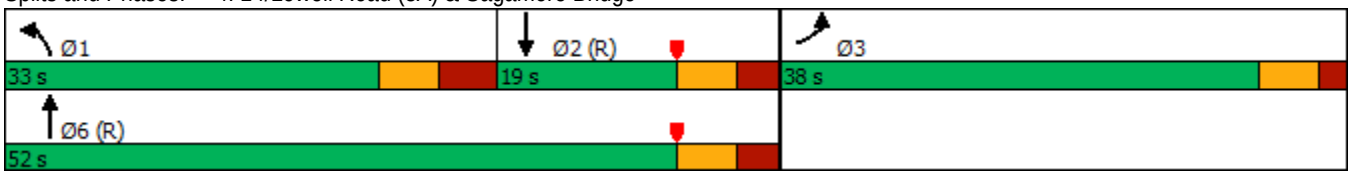


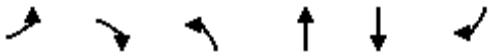
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	980	1095	1038	379	395	1558
Future Volume (vph)	980	1095	1038	379	395	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1227
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Adj. Flow (vph)	1043	1165	1128	412	429	1693
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1043	1165	1128	412	429	1693
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	38.0		33.0	52.0	19.0	
Total Split (%)	42.2%		36.7%	57.8%	21.1%	
Maximum Green (s)	32.0		25.0	45.0	12.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	30.6	90.0	25.0	46.4	13.4	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
v/c Ratio	0.84	0.70	0.83	0.23	0.82	0.61
Control Delay	34.3	2.5	25.7	4.6	35.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	2.5	25.7	4.6	35.0	4.2
LOS	C	A	C	A	D	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	17.6			20.1	10.5	
Approach LOS	B			C	B	
Queue Length 50th (ft)	271	0	221	17	122	93
Queue Length 95th (ft)	349	0	231	12	m134	m102
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1302	1656	1377	1824	525	2760
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	0.80	0.70	0.82	0.23	0.82	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 75.3%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: 14/Lowell Road (3A) & Sagamore Bridge

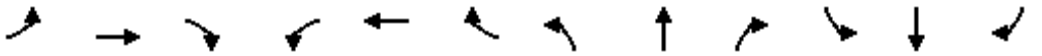




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	980	1095	1038	379	395	1558
Future Volume (vph)	980	1095	1038	379	395	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1043	1165	1128	412	429	1693
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1043	1165	1128	412	429	1693
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	30.6	90.0	25.0	46.4	13.4	90.0
Effective Green, g (s)	30.6	90.0	25.0	46.4	13.4	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1245	1656	1359	1824	526	2760
v/s Ratio Prot	0.28		0.23	0.12	0.12	
v/s Ratio Perm		c0.70				0.61
v/c Ratio	0.84	0.70	0.83	0.23	0.82	0.61
Uniform Delay, d1	27.4	0.0	30.5	12.0	37.1	0.0
Progression Factor	1.00	1.00	0.66	0.35	0.73	1.00
Incremental Delay, d2	5.3	2.5	4.1	0.2	5.2	0.4
Delay (s)	32.7	2.5	24.2	4.4	32.4	0.4
Level of Service	C	A	C	A	C	A
Approach Delay (s)	16.8			18.9	6.9	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

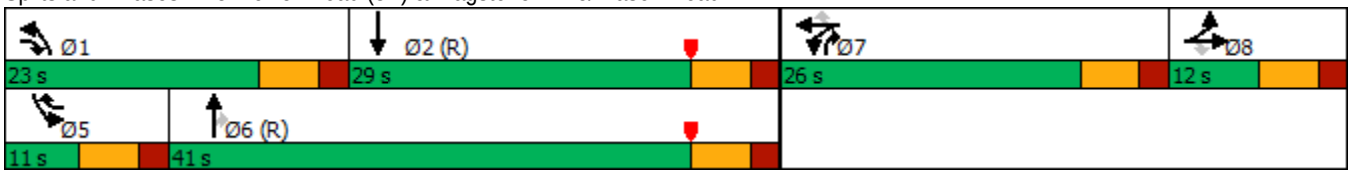


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Future Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Flt Permitted		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			182			198		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Adj. Flow (vph)	80	35	368	653	44	32	340	875	198	17	1290	11
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	115	368	346	351	32	340	875	198	17	1301	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	12.0	12.0	23.0	26.0	26.0	11.0	23.0	41.0	26.0	11.0	29.0	
Total Split (%)	13.3%	13.3%	25.6%	28.9%	28.9%	12.2%	25.6%	45.6%	28.9%	12.2%	32.2%	
Maximum Green (s)	6.0	6.0	17.0	20.0	20.0	5.0	17.0	35.0	20.0	5.0	23.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		6.0	29.0	20.0	20.0	25.0	17.0	39.4	65.4	5.0	23.0	
Actuated g/C Ratio		0.07	0.32	0.22	0.22	0.28	0.19	0.44	0.73	0.06	0.26	
v/c Ratio		0.94	0.63	0.95	0.95	0.06	1.01	0.56	0.10	0.18	1.00	
Control Delay		112.3	23.6	72.8	73.2	0.2	94.3	20.0	0.1	44.9	60.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		112.3	23.6	72.8	73.2	0.2	94.3	20.0	0.1	44.9	60.1	
LOS		F	C	E	E	A	F	C	A	D	E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		44.7			69.8			35.1			59.9	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)		66	123	205	208	0	~214	133	0	9	~272	
Queue Length 95th (ft)		#147	183	#382	#386	0	m#339	206	m0	29	#355	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		122	583	364	368	548	337	1549	2079	97	1298	
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		0.94	0.63	0.95	0.95	0.06	1.01	0.56	0.10	0.18	1.00	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 48 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 51.0		Intersection LOS: D	
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			
~ 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.			

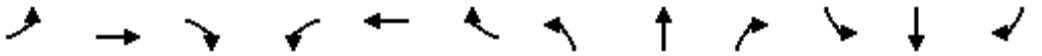
Splits and Phases: 5: Lowell Road (3A) & Flagstone Drive/Wason Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Future Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	80	35	368	653	44	32	340	875	198	17	1290	11
RTOR Reduction (vph)	0	0	81	0	0	24	0	0	73	0	1	0
Lane Group Flow (vph)	0	115	287	346	351	8	340	875	125	17	1300	0
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Effective Green, g (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Actuated g/C Ratio		0.07	0.26	0.22	0.22	0.26	0.19	0.41	0.63	0.03	0.26	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		122	510	364	368	383	337	1454	1950	58	1297	
v/s Ratio Prot		c0.06	0.11	0.21	c0.21	0.00	c0.19	0.25	0.01	0.01	c0.26	
v/s Ratio Perm			0.07			0.00			0.03			
v/c Ratio		0.94	0.56	0.95	0.95	0.02	1.01	0.60	0.06	0.29	1.00	
Uniform Delay, d1		41.8	29.1	34.5	34.5	25.1	36.5	20.7	6.3	42.5	33.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.34	0.94	0.00	1.00	1.00	
Incremental Delay, d2		63.4	1.2	34.4	34.8	0.0	45.2	1.4	0.0	2.0	25.6	
Delay (s)		105.2	30.3	68.9	69.3	25.1	94.2	20.8	0.0	44.5	59.1	
Level of Service		F	C	E	E	C	F	C	A	D	E	
Approach Delay (s)		48.1			67.2			35.6			58.9	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

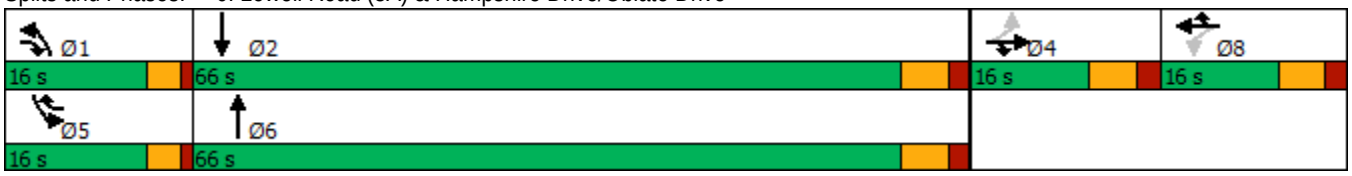


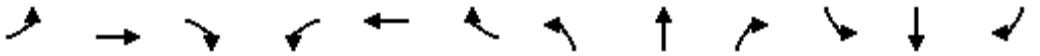
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Future Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850					0.993	
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1719	1455	0	1916	1669	1752	3505	0	1745	3480	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1810	1455	0	1963	1669	1752	3505	0	1745	3480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			86					7	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Adj. Flow (vph)	10	0	14	3	3	5	134	881	2	2	1427	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	14	0	6	5	134	883	0	2	1498	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		7.4	11.6		6.5	9.1	11.0	68.3		5.1	49.3	
Actuated g/C Ratio		0.09	0.15		0.08	0.11	0.14	0.86		0.06	0.62	
v/c Ratio		0.06	0.05		0.04	0.02	0.55	0.29		0.02	0.69	
Control Delay		44.4	0.4		46.6	0.2	48.1	5.1		48.5	14.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		44.4	0.4		46.6	0.2	48.1	5.1		48.5	14.9	
LOS		D	A		D	A	D	A		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			25.5			10.7			15.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		4	0		2	0	50	0		1	153	
Queue Length 95th (ft)		22	0		16	0	#183	207		8	454	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		251	326		272	363	292	3016		290	2772	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.04	0.04		0.02	0.01	0.46	0.29		0.01	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 79.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Future Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1455		1915	1669	1752	3504		1745	3480	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1455		1963	1669	1752	3504		1745	3480	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	10	0	14	2	2	5	134	881	2	2	1427	71
RTOR Reduction (vph)	0	0	12	0	0	5	0	0	0	0	3	0
Lane Group Flow (vph)	0	10	2	0	6	0	134	883	0	2	1495	0
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		2.6	13.6		1.9	8.6	11.0	63.4		0.7	53.1	
Effective Green, g (s)		2.6	13.6		1.9	8.6	11.0	63.4		0.7	53.1	
Actuated g/C Ratio		0.03	0.15		0.02	0.09	0.12	0.70		0.01	0.59	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		51	218		41	158	212	2452		13	2039	
v/s Ratio Prot			0.00			0.00	c0.08	0.25		0.00	c0.43	
v/s Ratio Perm		c0.01			c0.00							
v/c Ratio		0.20	0.01		0.15	0.00	0.63	0.36		0.15	0.73	
Uniform Delay, d1		43.0	32.8		43.6	37.1	37.9	5.5		44.7	13.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		1.6	0.0	4.5	0.1		2.0	1.4	
Delay (s)		44.9	32.8		45.2	37.1	42.3	5.5		46.7	15.0	
Level of Service		D	C		D	D	D	A		D	B	
Approach Delay (s)		37.8			41.5			10.4			15.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

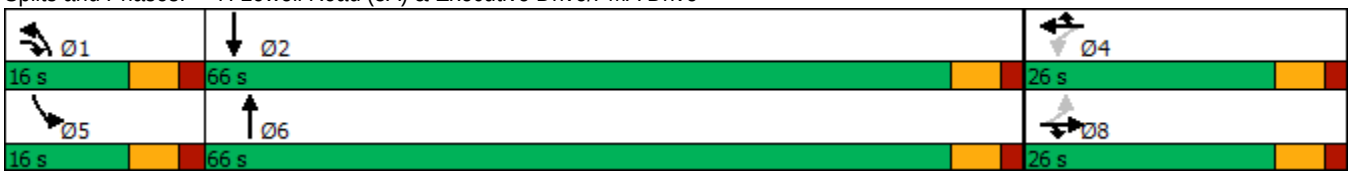
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	2	22	141	30	101	179	455	60	107	1074	203
Future Volume (vph)	56	2	22	141	30	101	179	455	60	107	1074	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.983			0.976	
Flt Protected		0.954			0.961		0.950			0.950		
Satd. Flow (prot)	0	1613	1421	0	1811	1620	1678	3416	0	1728	3454	0
Flt Permitted		0.451			0.714		0.950			0.950		
Satd. Flow (perm)	0	763	1421	0	1346	1620	1678	3416	0	1728	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			101		21			32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Adj. Flow (vph)	70	3	28	176	38	126	197	500	66	118	1180	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	73	28	0	214	126	197	566	0	118	1403	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		17.9	34.3		17.9	17.9	10.2	48.7		9.2	47.7	
Actuated g/C Ratio		0.19	0.36		0.19	0.19	0.11	0.52		0.10	0.51	
v/c Ratio		0.50	0.05		0.84	0.32	1.09	0.32		0.70	0.80	
Control Delay		50.7	8.4		66.5	13.8	135.6	13.2		66.8	22.5	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		50.7	8.4		66.5	13.8	135.6	13.2		66.8	22.5	
LOS		D	A		E	B	F	B		E	C	

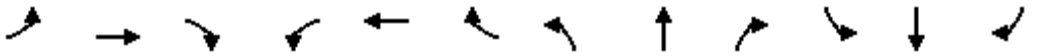
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		38.9			46.9			44.8			25.9	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)		40	0		126	13	~143	99		71	353	
Queue Length 95th (ft)		84	15		#227	51	#317	133		#172	438	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		165	524		291	430	181	2227		187	2255	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.44	0.05		0.74	0.29	1.09	0.25		0.63	0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 94.2			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 34.3		Intersection LOS: C	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			

~ 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: 7: Lowell Road (3A) & Executive Drive/PMA Drive

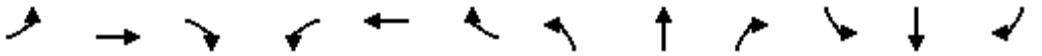




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	2	22	141	30	101	179	455	60	107	1074	203
Future Volume (vph)	56	2	22	141	30	101	179	455	60	107	1074	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1613	1421		1810	1620	1678	3414		1728	3455	
Flt Permitted		0.45	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		762	1421		1346	1620	1678	3414		1728	3455	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	70	2	28	176	38	126	197	500	66	118	1180	223
RTOR Reduction (vph)	0	0	18	0	0	82	0	10	0	0	16	0
Lane Group Flow (vph)	0	73	10	0	214	44	197	556	0	118	1387	0
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		17.9	34.1		17.9	17.9	10.2	48.7		9.2	47.7	
Effective Green, g (s)		17.9	34.1		17.9	17.9	10.2	48.7		9.2	47.7	
Actuated g/C Ratio		0.19	0.36		0.19	0.19	0.11	0.52		0.10	0.51	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		145	516		256	309	182	1772		169	1756	
v/s Ratio Prot			0.01			0.03	c0.12	0.16		0.07	c0.40	
v/s Ratio Perm		0.10			c0.16							
v/c Ratio		0.50	0.02		0.84	0.14	1.08	0.31		0.70	0.79	
Uniform Delay, d1		34.0	19.1		36.5	31.6	41.8	13.0		41.0	18.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.0		19.6	0.1	90.4	0.1		9.7	2.5	
Delay (s)		35.0	19.1		56.2	31.6	132.2	13.1		50.7	21.4	
Level of Service		C	B		E	C	F	B		D	C	
Approach Delay (s)		30.6			47.1			43.8			23.7	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Future Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1719	1583	0	1865	1669	1745	3356	0	1805	1863	0
Flt Permitted		0.752			0.748		0.950			0.950		
Satd. Flow (perm)	0	1361	1583	0	1469	1669	1745	3356	0	1805	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			55						
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Adj. Flow (vph)	14	0	60	8	0	13	4	644	1	17	1397	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	60	0	8	13	4	645	0	17	1400	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		6.3	6.3		6.3	18.3	5.0	147.7		6.0	153.1	
Actuated g/C Ratio		0.04	0.04		0.04	0.10	0.03	0.82		0.03	0.85	
v/c Ratio		0.30	0.42		0.16	0.06	0.08	0.23		0.28	0.88	
Control Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	19.2	

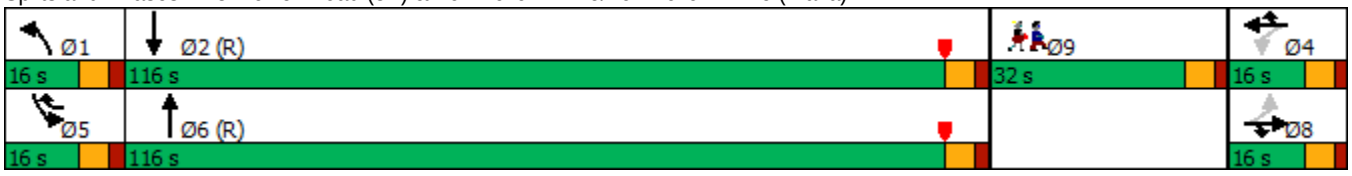
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	17.5	
Total Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	36.7	
LOS		F	B		F	A	F	A		F	D	
Approach Delay		29.0			34.7			6.3			37.4	
Approach LOS		C			C			A			D	
Queue Length 50th (ft)		17	0		9	0	5	68		20	464	
Queue Length 95th (ft)		40	3		27	0	20	213		50	#2213	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		75	173		81	234	96	2753		100	1585	
Starvation Cap Reductn		0	0		0	0	0	0		0	218	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.19	0.35		0.10	0.06	0.04	0.23		0.17	1.02	

Intersection Summary

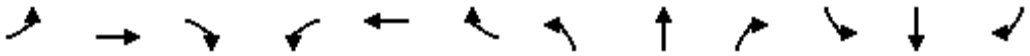
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 27.7 Intersection LOS: C
Intersection Capacity Utilization 93.4% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Future Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	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	
Satd. Flow (prot)		1719	1583		1865	1669	1745	3355		1805	1862	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1362	1583		1469	1669	1745	3355		1805	1862	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	14	0	60	8	0	12	4	644	1	17	1397	3
RTOR Reduction (vph)	0	0	58	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	8	1	4	645	0	17	1400	0
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Effective Green, g (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Actuated g/C Ratio		0.03	0.03		0.03	0.09	0.01	0.78		0.02	0.80	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		47	55		51	151	9	2618		40	1484	
v/s Ratio Prot			0.00			0.00	0.00	0.19		c0.01	c0.75	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.30	0.04		0.16	0.01	0.44	0.25		0.42	0.94	
Uniform Delay, d1		84.7	83.9		84.3	74.5	89.2	5.4		86.9	14.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3	0.1		0.5	0.0	12.2	0.2		2.6	13.3	
Delay (s)		86.0	84.0		84.8	74.5	101.4	5.6		89.5	28.2	
Level of Service		F	F		F	E	F	A		F	C	
Approach Delay (s)		84.4			78.4			6.2			28.9	
Approach LOS		F			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	232	73	520	84	64	1118	
Future Volume (vph)	232	73	520	84	64	1118	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.981				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1787	1524	1839	0	1719	1863	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1524	1839	0	1719	1863	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29	7				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.96	
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%	
Adj. Flow (vph)	264	83	565	91	67	1165	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	264	83	656	0	67	1165	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	40.3	57.6	113.4		11.2	130.7	
Actuated g/C Ratio	0.21	0.30	0.60		0.06	0.69	
v/c Ratio	0.70	0.17	0.60		0.66	0.91	
Control Delay	77.6	36.4	26.5		111.9	36.1	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	2.9		0.0	0.0	
Total Delay	77.6	36.4	29.3		111.9	36.1	
LOS	E	D	C		F	D	
Approach Delay	67.7		29.3			40.2	
Approach LOS	E		C			D	
Queue Length 50th (ft)	308	48	470		82	1018	
Queue Length 95th (ft)	#620	114	652		#210	#1718	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	379	482	1100		101	1281	
Starvation Cap Reductn	0	0	323		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.17	0.84		0.66	0.91	

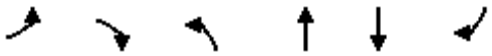
Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 41.3		Intersection LOS: D	
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	232	73	520	84	64	1118
Future Volume (vph)	232	73	520	84	64	1118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1524	1840		1719	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1524	1840		1719	1863
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.96
Adj. Flow (vph)	264	83	565	91	67	1165
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	264	63	653	0	67	1165
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	40.3	57.5	108.7		11.2	125.9
Effective Green, g (s)	40.3	57.5	108.7		11.2	125.9
Actuated g/C Ratio	0.21	0.30	0.57		0.06	0.66
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	379	461	1052		101	1234
v/s Ratio Prot	c0.15	0.04	0.35		0.04	c0.63
v/s Ratio Perm						
v/c Ratio	0.70	0.14	0.62		0.66	0.94
Uniform Delay, d1	69.2	48.2	27.0		87.6	28.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.5	0.0	2.8		12.0	15.3
Delay (s)	73.7	48.2	29.7		99.5	44.2
Level of Service	E	D	C		F	D
Approach Delay (s)	67.6		29.7			47.2
Approach LOS	E		C			D

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	23	0	612	1361	10
Future Volume (vph)	0	23	0	612	1361	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1827	1863	1468
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1827	1863	1468
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	2%	10%
Adj. Flow (vph)	0	26	0	680	1512	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	26	0	680	1512	11
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

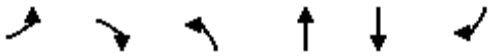
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	612	1361	10
Future Vol, veh/h	0	23	0	612	1361	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	2	10
Mvmt Flow	0	26	0	680	1512	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1512	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	149	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	149	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.1	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	149	-	-
HCM Lane V/C Ratio	-	0.172	-	-
HCM Control Delay (s)	-	34.1	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-

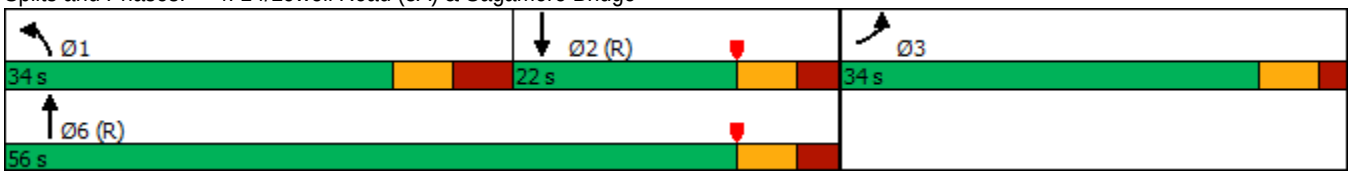


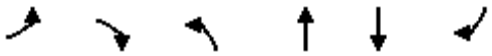
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1051	1184	1131	408	427	1704
Future Volume (vph)	1051	1184	1131	408	427	1704
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1198
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Adj. Flow (vph)	1118	1260	1229	443	464	1852
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	1260	1229	443	464	1852
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	34.0		34.0	56.0	22.0	
Total Split (%)	37.8%		37.8%	62.2%	24.4%	
Maximum Green (s)	28.0		26.0	49.0	15.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	28.2	90.0	26.0	48.8	14.8	90.0
Actuated g/C Ratio	0.31	1.00	0.29	0.54	0.16	1.00
v/c Ratio	0.97	0.76	0.87	0.23	0.80	0.67
Control Delay	52.6	3.4	26.4	4.4	49.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	3.4	26.4	4.4	49.3	4.8
LOS	D	A	C	A	D	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	26.5			20.6	13.7	
Approach LOS	C			C	B	
Queue Length 50th (ft)	322	0	79	11	126	268
Queue Length 95th (ft)	#461	0	#256	17	m134	m273
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1149	1656	1413	1926	589	2760
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	0.97	0.76	0.87	0.23	0.79	0.67

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 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: 4: 14/Lowell Road (3A) & Sagamore Bridge

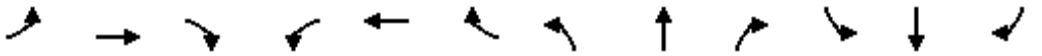




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1051	1184	1131	408	427	1704
Future Volume (vph)	1051	1184	1131	408	427	1704
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1118	1260	1229	443	464	1852
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1118	1260	1229	443	464	1852
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	28.2	90.0	26.0	48.8	14.8	90.0
Effective Green, g (s)	28.2	90.0	26.0	48.8	14.8	90.0
Actuated g/C Ratio	0.31	1.00	0.29	0.54	0.16	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1147	1656	1413	1918	581	2760
v/s Ratio Prot	c0.31		0.25	0.13	0.13	
v/s Ratio Perm		c0.76				0.67
v/c Ratio	0.97	0.76	0.87	0.23	0.80	0.67
Uniform Delay, d1	30.5	0.0	30.4	10.8	36.2	0.0
Progression Factor	1.00	1.00	0.64	0.38	1.25	1.00
Incremental Delay, d2	20.6	3.4	5.3	0.2	3.6	0.4
Delay (s)	51.2	3.4	24.6	4.4	48.8	0.4
Level of Service	D	A	C	A	D	A
Approach Delay (s)	25.8			19.2	10.1	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

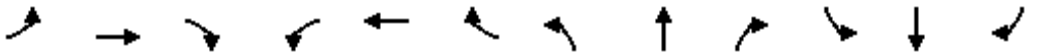


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	29	318	677	45	33	334	898	208	17	1217	11
Future Volume (vph)	67	29	318	677	45	33	334	898	208	17	1217	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5078	0
Flt Permitted		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5078	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			182			219		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Adj. Flow (vph)	83	36	393	720	48	35	352	945	219	20	1399	13
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	119	393	382	386	35	352	945	219	20	1412	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	12.0	12.0	20.0	27.0	27.0	11.0	20.0	40.0	27.0	11.0	31.0	
Total Split (%)	13.3%	13.3%	22.2%	30.0%	30.0%	12.2%	22.2%	44.4%	30.0%	12.2%	34.4%	
Maximum Green (s)	6.0	6.0	14.0	21.0	21.0	5.0	14.0	34.0	21.0	5.0	25.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		6.0	26.0	21.0	21.0	26.0	14.0	38.4	65.4	5.0	25.0	
Actuated g/C Ratio		0.07	0.29	0.23	0.23	0.29	0.16	0.43	0.73	0.06	0.28	
v/c Ratio		0.98	0.74	1.00	1.00	0.06	1.27	0.63	0.11	0.21	1.00	
Control Delay		120.4	30.2	82.8	82.5	0.2	165.6	16.3	3.8	45.8	57.7	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		120.4	30.2	82.8	82.5	0.2	165.6	16.3	3.8	45.8	57.7	
LOS		F	C	F	F	A	F	B	A	D	E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		51.1			79.0			49.2			57.5	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)		69	146	229	231	0	~244	243	19	11	~293	
Queue Length 95th (ft)		#152	212	#422	#425	0	m#300	m294	m26	33	#379	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		122	534	382	386	563	277	1509	2085	97	1411	
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		0.98	0.74	1.00	1.00	0.06	1.27	0.63	0.11	0.21	1.00	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 80 (89%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 57.8		Intersection LOS: E	
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			
~ 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	29	318	677	45	33	334	898	208	17	1217	11
Future Volume (vph)	67	29	318	677	45	33	334	898	208	17	1217	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5076	
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5076	
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	83	36	393	720	48	35	352	945	219	20	1399	13
RTOR Reduction (vph)	0	0	85	0	0	26	0	0	80	0	1	0
Lane Group Flow (vph)	0	119	308	382	386	9	352	945	139	20	1411	0
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		6.0	20.0	21.0	21.0	24.0	14.0	36.0	57.0	3.0	25.0	
Effective Green, g (s)		6.0	20.0	21.0	21.0	24.0	14.0	36.0	57.0	3.0	25.0	
Actuated g/C Ratio		0.07	0.22	0.23	0.23	0.27	0.16	0.40	0.63	0.03	0.28	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		122	457	382	386	400	277	1415	1950	58	1410	
v/s Ratio Prot		0.06	c0.10	0.23	c0.23	0.00	c0.20	0.27	0.02	0.01	c0.28	
v/s Ratio Perm			0.09			0.01			0.03			
v/c Ratio		0.98	0.67	1.00	1.00	0.02	1.27	0.67	0.07	0.34	1.00	
Uniform Delay, d1		41.9	32.0	34.5	34.5	24.4	38.0	22.1	6.3	42.5	32.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.68	0.70	4.95	1.00	1.00	
Incremental Delay, d2		73.2	3.6	46.0	45.8	0.0	138.6	1.6	0.0	2.6	24.2	
Delay (s)		115.1	35.6	80.5	80.3	24.4	164.3	17.0	31.4	45.1	56.7	
Level of Service		F	D	F	F	C	F	B	C	D	E	
Approach Delay (s)		54.1			78.0			53.3			56.5	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

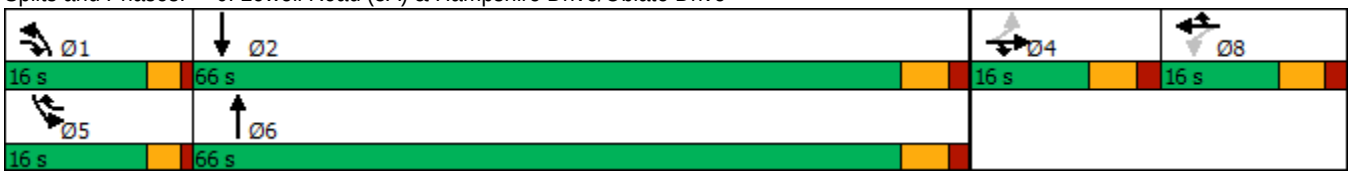
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	13	2	2	5	129	857	2	2	1285	65
Future Volume (vph)	9	0	13	2	2	5	129	857	2	2	1285	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850					0.993	
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1719	1455	0	1916	1669	1752	3505	0	1745	3480	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1810	1455	0	1963	1669	1752	3505	0	1745	3480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			86					7	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Adj. Flow (vph)	11	0	16	3	3	6	143	952	2	2	1548	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	16	0	6	6	143	954	0	2	1626	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		7.4	11.9		6.3	9.1	11.3	71.8		5.0	53.0	
Actuated g/C Ratio		0.09	0.14		0.08	0.11	0.14	0.86		0.06	0.63	
v/c Ratio		0.07	0.06		0.04	0.02	0.61	0.32		0.02	0.74	
Control Delay		45.2	0.4		47.2	0.2	51.6	5.2		49.0	16.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		45.2	0.4		47.2	0.2	51.6	5.2		49.0	16.1	
LOS		D	A		D	A	D	A		D	B	

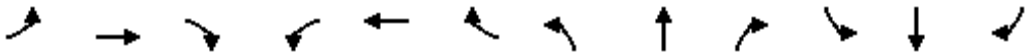
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			23.7			11.3			16.2	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		5	0		3	0	63	0		1	177	
Queue Length 95th (ft)		23	0		16	0	#201	229		8	521	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		232	311		252	347	270	2996		269	2680	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.05	0.05		0.02	0.02	0.53	0.32		0.01	0.61	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 83.5			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	13	2	2	5	129	857	2	2	1285	65
Future Volume (vph)	9	0	13	2	2	5	129	857	2	2	1285	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1455		1915	1669	1752	3504		1745	3480	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1455		1963	1669	1752	3504		1745	3480	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	11	0	16	2	2	6	143	952	2	2	1548	78
RTOR Reduction (vph)	0	0	14	0	0	5	0	0	0	0	3	0
Lane Group Flow (vph)	0	11	2	0	6	1	143	954	0	2	1623	0
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		2.8	14.1		2.0	8.8	11.3	67.2		0.8	56.7	
Effective Green, g (s)		2.8	14.1		2.0	8.8	11.3	67.2		0.8	56.7	
Actuated g/C Ratio		0.03	0.15		0.02	0.09	0.12	0.71		0.01	0.60	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		53	216		41	154	208	2483		14	2081	
v/s Ratio Prot			0.00			0.00	c0.08	0.27		0.00	c0.47	
v/s Ratio Perm		c0.01			c0.00							
v/c Ratio		0.21	0.01		0.15	0.00	0.69	0.38		0.14	0.78	
Uniform Delay, d1		44.9	34.4		45.6	39.0	40.1	5.5		46.7	14.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		1.6	0.0	7.3	0.1		1.7	2.0	
Delay (s)		46.9	34.4		47.2	39.0	47.4	5.6		48.4	16.3	
Level of Service		D	C		D	D	D	A		D	B	
Approach Delay (s)		39.5			43.1			11.1			16.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

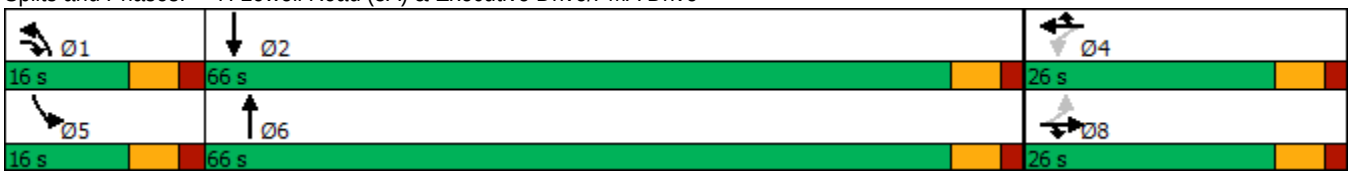
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	2	19	141	30	101	184	497	60	107	1169	224
Future Volume (vph)	58	2	19	141	30	101	184	497	60	107	1169	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.984			0.976	
Flt Protected		0.954			0.961		0.950			0.950		
Satd. Flow (prot)	0	1571	1558	0	1811	1620	1711	3419	0	1728	3454	0
Flt Permitted		0.432			0.712		0.950			0.950		
Satd. Flow (perm)	0	711	1558	0	1342	1620	1711	3419	0	1728	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			101		19			33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	12%	0%	14%	1%	0%	3%	2%	4%	3%	1%	2%	2%
Adj. Flow (vph)	73	3	24	176	38	126	202	546	66	118	1285	246
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	76	24	0	214	126	202	612	0	118	1531	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		18.2	34.5		18.2	18.2	10.2	53.4		9.3	52.5	
Actuated g/C Ratio		0.18	0.35		0.18	0.18	0.10	0.54		0.09	0.53	
v/c Ratio		0.58	0.04		0.87	0.33	1.15	0.33		0.73	0.83	
Control Delay		59.2	7.4		74.0	14.2	159.4	13.0		72.4	23.7	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		59.2	7.4		74.0	14.2	159.4	13.0		72.4	23.7	
LOS		E	A		E	B	F	B		E	C	

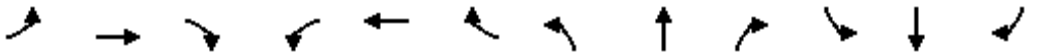
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		46.8			51.8			49.4			27.2	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)		47	0		141	14	~171	110		79	412	
Queue Length 95th (ft)		88	13		#228	51	#323	146		#172	511	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		145	546		274	412	175	2107		177	2134	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.52	0.04		0.78	0.31	1.15	0.29		0.67	0.72	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 99.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 80.7%		ICU Level of Service D	
Analysis Period (min) 15			

~ 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: 7: Lowell Road (3A) & Executive Drive/PMA Drive

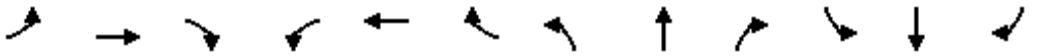




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	2	19	141	30	101	184	497	60	107	1169	224
Future Volume (vph)	58	2	19	141	30	101	184	497	60	107	1169	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1571	1558		1810	1620	1711	3419		1728	3454	
Flt Permitted		0.43	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		711	1558		1342	1620	1711	3419		1728	3454	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	72	2	24	176	38	126	202	546	66	118	1285	246
RTOR Reduction (vph)	0	0	16	0	0	82	0	9	0	0	15	0
Lane Group Flow (vph)	0	76	8	0	214	44	202	603	0	118	1516	0
Heavy Vehicles (%)	12%	0%	14%	1%	0%	3%	2%	4%	3%	1%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		18.2	34.4		18.2	18.2	10.2	53.4		9.3	52.5	
Effective Green, g (s)		18.2	34.4		18.2	18.2	10.2	53.4		9.3	52.5	
Actuated g/C Ratio		0.18	0.35		0.18	0.18	0.10	0.54		0.09	0.53	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		130	541		246	298	176	1846		162	1833	
v/s Ratio Prot			0.01			0.03	c0.12	0.18		0.07	c0.44	
v/s Ratio Perm		0.11			c0.16							
v/c Ratio		0.58	0.02		0.87	0.15	1.15	0.33		0.73	0.83	
Uniform Delay, d1		36.9	21.1		39.2	33.8	44.4	12.7		43.6	19.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3	0.0		25.5	0.1	113.2	0.1		12.9	3.2	
Delay (s)		41.2	21.2		64.7	33.9	157.5	12.8		56.5	22.6	
Level of Service		D	C		E	C	F	B		E	C	
Approach Delay (s)		36.4			53.3			48.7			25.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



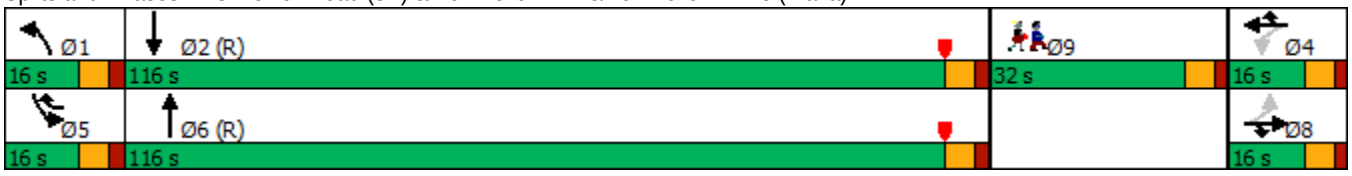
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	638	1	16	1451	3
Future Volume (vph)	11	0	48	6	0	10	4	638	1	16	1451	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1719	1583	0	1865	1669	1745	3356	0	1805	1863	0
Flt Permitted		0.752			0.748		0.950			0.950		
Satd. Flow (perm)	0	1361	1583	0	1469	1669	1745	3356	0	1805	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			55						
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Adj. Flow (vph)	14	0	60	8	0	13	4	701	1	17	1527	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	60	0	8	13	4	702	0	17	1530	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		6.3	6.3		6.3	18.3	5.0	147.7		6.0	153.1	
Actuated g/C Ratio		0.04	0.04		0.04	0.10	0.03	0.82		0.03	0.85	
v/c Ratio		0.30	0.42		0.16	0.06	0.08	0.25		0.28	0.97	
Control Delay		100.2	12.4		90.2	0.5	89.0	5.9		95.9	28.8	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	27.7	
Total Delay		100.2	12.4		90.2	0.5	89.0	5.9		95.9	56.5	
LOS		F	B		F	A	F	A		F	E	
Approach Delay		29.0			34.7			6.4			57.0	
Approach LOS		C			C			A			E	
Queue Length 50th (ft)		17	0		9	0	5	75		20	703	
Queue Length 95th (ft)		40	3		27	0	20	234		50	#2526	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		75	173		81	234	96	2753		100	1585	
Starvation Cap Reductn		0	0		0	0	0	0		0	148	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.19	0.35		0.10	0.06	0.04	0.25		0.17	1.06	

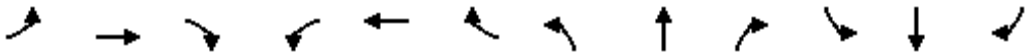
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 99.9%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	638	1	16	1451	3
Future Volume (vph)	11	0	48	6	0	10	4	638	1	16	1451	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	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	
Satd. Flow (prot)		1719	1583		1865	1669	1745	3355		1805	1862	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1362	1583		1469	1669	1745	3355		1805	1862	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	14	0	60	8	0	12	4	701	1	17	1527	3
RTOR Reduction (vph)	0	0	58	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	8	1	4	702	0	17	1530	0
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Effective Green, g (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Actuated g/C Ratio		0.03	0.03		0.03	0.09	0.01	0.78		0.02	0.80	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		47	55		51	151	9	2618		40	1484	
v/s Ratio Prot			0.00			0.00	0.00	0.21		c0.01	c0.82	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.30	0.04		0.16	0.01	0.44	0.27		0.42	1.03	
Uniform Delay, d1		84.7	83.9		84.3	74.5	89.2	5.5		86.9	18.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3	0.1		0.5	0.0	12.2	0.3		2.6	31.7	
Delay (s)		86.0	84.0		84.8	74.5	101.4	5.7		89.5	50.0	
Level of Service		F	F		F	E	F	A		F	D	
Approach Delay (s)		84.4			78.4			6.3			50.4	
Approach LOS		F			E			A			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	256	81	565	93	71	1220	
Future Volume (vph)	256	81	565	93	71	1220	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.981				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1787	1524	1839	0	1719	1863	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1524	1839	0	1719	1863	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29	7				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.96	
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%	
Adj. Flow (vph)	291	92	614	101	74	1271	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	291	92	715	0	74	1271	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	43.5	60.2	110.8		10.8	127.5	
Actuated g/C Ratio	0.23	0.32	0.58		0.06	0.67	
v/c Ratio	0.71	0.18	0.67		0.76	1.02	
Control Delay	75.3	36.8	30.5		125.3	60.1	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	4.6		0.0	0.0	
Total Delay	75.3	36.8	35.0		125.3	60.1	
LOS	E	D	D		F	E	
Approach Delay	66.1		35.0			63.7	
Approach LOS	E		D			E	
Queue Length 50th (ft)	334	53	590		90	1436	
Queue Length 95th (ft)	#695	129	746		#233	#1990	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	408	503	1074		97	1250	
Starvation Cap Reductn	0	0	281		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.71	0.18	0.90		0.76	1.02	

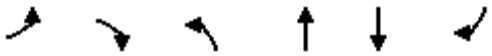
Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 55.7		Intersection LOS: E	
Intersection Capacity Utilization 88.4%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	256	81	565	93	71	1220
Future Volume (vph)	256	81	565	93	71	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1524	1839		1719	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1524	1839		1719	1863
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.96
Adj. Flow (vph)	291	92	614	101	74	1271
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	291	72	712	0	74	1271
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	43.5	60.3	105.9		10.8	122.7
Effective Green, g (s)	43.5	60.3	105.9		10.8	122.7
Actuated g/C Ratio	0.23	0.32	0.56		0.06	0.65
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	409	483	1025		97	1203
v/s Ratio Prot	c0.16	0.05	0.39		0.04	c0.68
v/s Ratio Perm						
v/c Ratio	0.71	0.15	0.69		0.76	1.06
Uniform Delay, d1	67.5	46.5	30.4		88.3	33.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.8	0.1	3.9		26.7	42.3
Delay (s)	72.3	46.5	34.3		115.1	75.9
Level of Service	E	D	C		F	E
Approach Delay (s)	66.1		34.3			78.1
Approach LOS	E		C			E

Intersection Summary			
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	15	0	656	1485	4
Future Volume (vph)	0	15	0	656	1485	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1827	1863	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1827	1863	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	2%	0%
Adj. Flow (vph)	0	17	0	729	1650	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	17	0	729	1650	4
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

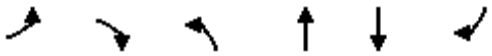
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	15	0	656	1485	4
Future Vol, veh/h	0	15	0	656	1485	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	2	0
Mvmt Flow	0	17	0	729	1650	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1650	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	123	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	123	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	38.8	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	123	-	-
HCM Lane V/C Ratio	-	0.136	-	-
HCM Control Delay (s)	-	38.8	-	-
HCM Lane LOS	-	E	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

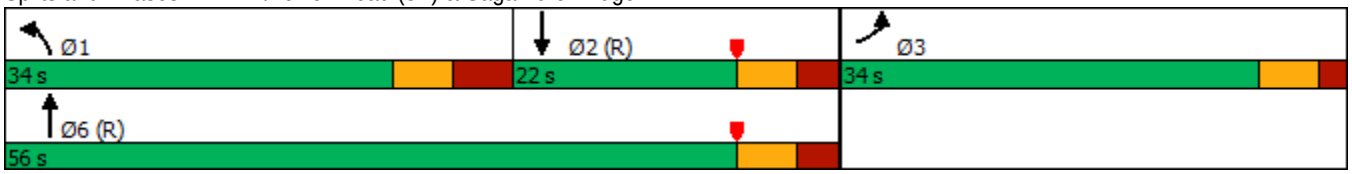


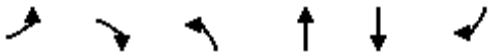
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1077	1184	1131	413	429	1714
Future Volume (vph)	1077	1184	1131	413	429	1714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1198
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Adj. Flow (vph)	1146	1260	1229	449	466	1863
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1146	1260	1229	449	466	1863
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	34.0		34.0	56.0	22.0	
Total Split (%)	37.8%		37.8%	62.2%	24.4%	
Maximum Green (s)	28.0		26.0	49.0	15.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	28.2	90.0	26.0	48.8	14.8	90.0
Actuated g/C Ratio	0.31	1.00	0.29	0.54	0.16	1.00
v/c Ratio	1.00	0.76	0.87	0.23	0.80	0.68
Control Delay	58.4	3.4	26.4	4.4	49.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	3.4	26.4	4.4	49.3	5.0
LOS	E	A	C	A	D	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	29.6			20.5	13.9	
Approach LOS	C			C	B	
Queue Length 50th (ft)	~337	0	79	11	127	272
Queue Length 95th (ft)	#479	0	#256	17	m133	m275
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1148	1656	1413	1926	589	2760
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	1.00	0.76	0.87	0.23	0.79	0.68

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 85 (94%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			
~ 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: 4: 14/Lowell Road (3A) & Sagamore Bridge

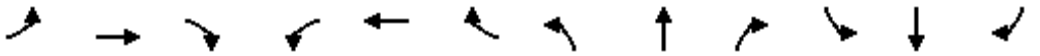




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1077	1184	1131	413	429	1714
Future Volume (vph)	1077	1184	1131	413	429	1714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1146	1260	1229	449	466	1863
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1146	1260	1229	449	466	1863
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	28.2	90.0	26.0	48.8	14.8	90.0
Effective Green, g (s)	28.2	90.0	26.0	48.8	14.8	90.0
Actuated g/C Ratio	0.31	1.00	0.29	0.54	0.16	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1147	1656	1413	1918	581	2760
v/s Ratio Prot	c0.31		0.25	0.13	0.13	
v/s Ratio Perm		c0.76				0.68
v/c Ratio	1.00	0.76	0.87	0.23	0.80	0.68
Uniform Delay, d1	30.9	0.0	30.4	10.8	36.2	0.0
Progression Factor	1.00	1.00	0.64	0.38	1.25	1.00
Incremental Delay, d2	26.2	3.4	5.3	0.2	3.6	0.4
Delay (s)	57.1	3.4	24.6	4.4	48.8	0.4
Level of Service	E	A	C	A	D	A
Approach Delay (s)	28.9			19.2	10.1	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

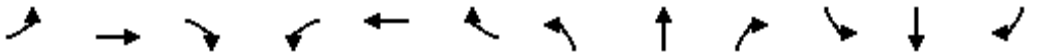


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	29	319	677	45	33	348	915	208	17	1229	11
Future Volume (vph)	67	29	319	677	45	33	348	915	208	17	1229	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5078	0
Flt Permitted		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5078	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			182			219		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Adj. Flow (vph)	83	36	394	720	48	35	366	963	219	20	1413	13
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	119	394	382	386	35	366	963	219	20	1426	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	12.0	12.0	20.0	27.0	27.0	11.0	20.0	40.0	27.0	11.0	31.0	
Total Split (%)	13.3%	13.3%	22.2%	30.0%	30.0%	12.2%	22.2%	44.4%	30.0%	12.2%	34.4%	
Maximum Green (s)	6.0	6.0	14.0	21.0	21.0	5.0	14.0	34.0	21.0	5.0	25.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		6.0	26.0	21.0	21.0	26.0	14.0	38.4	65.4	5.0	25.0	
Actuated g/C Ratio		0.07	0.29	0.23	0.23	0.29	0.16	0.43	0.73	0.06	0.28	
v/c Ratio		0.98	0.74	1.00	1.00	0.06	1.32	0.64	0.11	0.21	1.01	
Control Delay		120.4	30.3	82.8	82.5	0.2	185.7	16.4	3.8	45.8	60.0	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		120.4	30.3	82.8	82.5	0.2	185.7	16.4	3.8	45.8	60.0	
LOS		F	C	F	F	A	F	B	A	D	E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		51.2			79.0			54.6			59.8	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)		69	147	229	231	0	~261	256	19	11	~302	
Queue Length 95th (ft)		#152	214	#422	#425	0	m#308	m295	m25	33	#385	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		122	534	382	386	563	277	1509	2085	97	1411	
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		0.98	0.74	1.00	1.00	0.06	1.32	0.64	0.11	0.21	1.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 80 (89%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 60.5		Intersection LOS: E	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
~ 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	29	319	677	45	33	348	915	208	17	1229	11
Future Volume (vph)	67	29	319	677	45	33	348	915	208	17	1229	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	83	36	394	720	48	35	366	963	219	20	1413	13
RTOR Reduction (vph)	0	0	85	0	0	26	0	0	80	0	1	0
Lane Group Flow (vph)	0	119	309	382	386	9	366	963	139	20	1425	0
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		6.0	20.0	21.0	21.0	24.0	14.0	36.0	57.0	3.0	25.0	
Effective Green, g (s)		6.0	20.0	21.0	21.0	24.0	14.0	36.0	57.0	3.0	25.0	
Actuated g/C Ratio		0.07	0.22	0.23	0.23	0.27	0.16	0.40	0.63	0.03	0.28	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		122	457	382	386	400	277	1415	1950	58	1410	
v/s Ratio Prot		0.06	c0.11	0.23	c0.23	0.00	c0.20	0.27	0.02	0.01	c0.28	
v/s Ratio Perm			0.09			0.01			0.03			
v/c Ratio		0.98	0.68	1.00	1.00	0.02	1.32	0.68	0.07	0.34	1.01	
Uniform Delay, d1		41.9	32.0	34.5	34.5	24.4	38.0	22.3	6.3	42.5	32.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.68	0.70	4.92	1.00	1.00	
Incremental Delay, d2		73.2	3.6	46.0	45.8	0.0	159.1	1.6	0.0	2.6	26.7	
Delay (s)		115.1	35.6	80.5	80.3	24.4	184.8	17.1	31.2	45.1	59.2	
Level of Service		F	D	F	F	C	F	B	C	D	E	
Approach Delay (s)		54.1			78.0			58.8			59.0	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	61.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

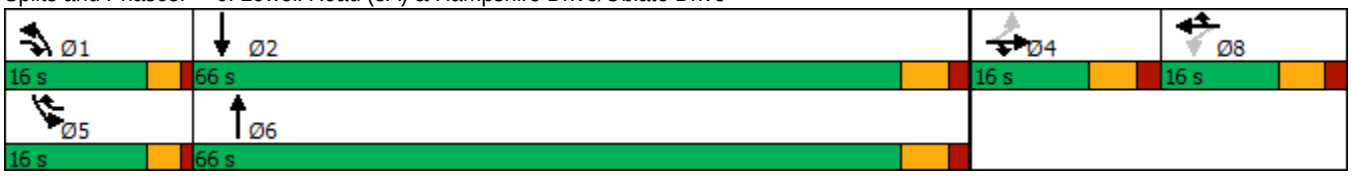
c Critical Lane Group

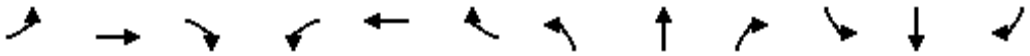
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	13	2	2	5	134	869	2	2	1297	65
Future Volume (vph)	9	0	13	2	2	5	134	869	2	2	1297	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850					0.993	
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1719	1455	0	1916	1669	1752	3505	0	1745	3480	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1810	1455	0	1963	1669	1752	3505	0	1745	3480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			86					7	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Adj. Flow (vph)	11	0	16	3	3	6	149	966	2	2	1563	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	16	0	6	6	149	968	0	2	1641	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		7.3	12.3		6.3	9.1	11.6	72.2		5.0	53.2	
Actuated g/C Ratio		0.09	0.15		0.08	0.11	0.14	0.86		0.06	0.63	
v/c Ratio		0.07	0.06		0.04	0.02	0.62	0.32		0.02	0.74	
Control Delay		45.3	0.4		47.4	0.2	52.0	5.2		49.0	16.5	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		45.3	0.4		47.4	0.2	52.0	5.2		49.0	16.5	
LOS		D	A		D	A	D	A		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			23.8			11.5			16.5	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		5	0		3	0	67	0		1	181	
Queue Length 95th (ft)		23	0		16	0	#212	233		8	530	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		230	310		250	345	268	2980		266	2659	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.05	0.05		0.02	0.02	0.56	0.32		0.01	0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 84			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 65.8%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive

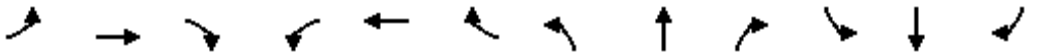




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	13	2	2	5	134	869	2	2	1297	65
Future Volume (vph)	9	0	13	2	2	5	134	869	2	2	1297	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1455		1915	1669	1752	3504		1745	3480	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1455		1963	1669	1752	3504		1745	3480	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	11	0	16	2	2	6	149	966	2	2	1563	78
RTOR Reduction (vph)	0	0	14	0	0	5	0	0	0	0	3	0
Lane Group Flow (vph)	0	11	2	0	6	1	149	968	0	2	1638	0
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		2.8	14.4		2.0	8.8	11.6	67.6		0.8	56.8	
Effective Green, g (s)		2.8	14.4		2.0	8.8	11.6	67.6		0.8	56.8	
Actuated g/C Ratio		0.03	0.15		0.02	0.09	0.12	0.71		0.01	0.60	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		53	220		41	154	213	2488		14	2076	
v/s Ratio Prot			0.00			0.00	c0.09	0.28		0.00	c0.47	
v/s Ratio Perm		c0.01			c0.00							
v/c Ratio		0.21	0.01		0.15	0.00	0.70	0.39		0.14	0.79	
Uniform Delay, d1		45.1	34.3		45.8	39.2	40.1	5.5		46.9	14.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		1.6	0.0	7.8	0.1		1.7	2.1	
Delay (s)		47.1	34.4		47.4	39.2	48.0	5.6		48.6	16.7	
Level of Service		D	C		D	D	D	A		D	B	
Approach Delay (s)		39.5			43.3			11.3			16.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



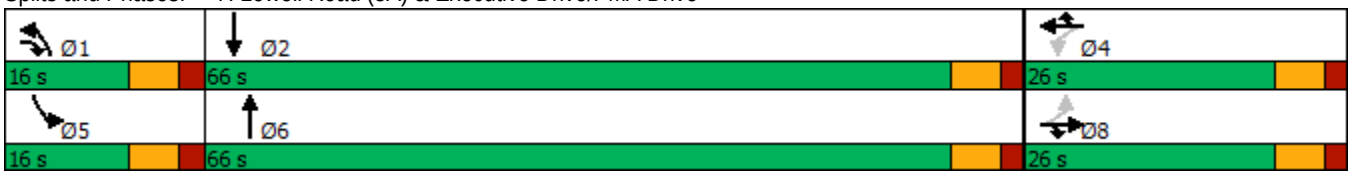
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	2	23	141	30	101	196	497	60	107	1177	224
Future Volume (vph)	60	2	23	141	30	101	196	497	60	107	1177	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.984			0.976	
Flt Protected		0.954			0.961		0.950			0.950		
Satd. Flow (prot)	0	1613	1421	0	1811	1620	1678	3419	0	1728	3454	0
Flt Permitted		0.431			0.711		0.950			0.950		
Satd. Flow (perm)	0	729	1421	0	1340	1620	1678	3419	0	1728	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			101		19			33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Adj. Flow (vph)	75	3	29	176	38	126	215	546	66	118	1293	246
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	29	0	214	126	215	612	0	118	1539	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		18.3	34.5		18.3	18.3	10.1	53.9		9.3	53.0	
Actuated g/C Ratio		0.18	0.35		0.18	0.18	0.10	0.54		0.09	0.53	
v/c Ratio		0.58	0.06		0.87	0.33	1.26	0.33		0.73	0.83	
Control Delay		58.6	8.8		74.4	14.2	195.7	13.0		72.8	23.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		58.6	8.8		74.4	14.2	195.7	13.0		72.8	23.8	
LOS		E	A		E	B	F	B		E	C	

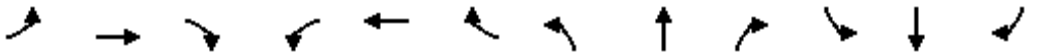
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		45.1			52.1			60.5			27.3	
Approach LOS		D			D			E			C	
Queue Length 50th (ft)		49	0		142	14	~193	110		79	416	
Queue Length 95th (ft)		90	16		#228	51	#349	146		#172	515	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		148	497		272	410	170	2094		175	2120	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.53	0.06		0.79	0.31	1.26	0.29		0.67	0.73	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 99.7			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 40.2		Intersection LOS: D	
Intersection Capacity Utilization 81.6%		ICU Level of Service D	
Analysis Period (min) 15			

~ 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: 7: Lowell Road (3A) & Executive Drive/PMA Drive

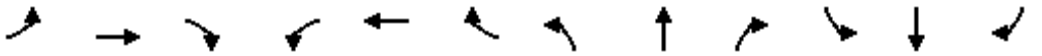




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	2	23	141	30	101	196	497	60	107	1177	224
Future Volume (vph)	60	2	23	141	30	101	196	497	60	107	1177	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1613	1421		1810	1620	1678	3419		1728	3454	
Flt Permitted		0.43	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		728	1421		1340	1620	1678	3419		1728	3454	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	75	2	29	176	38	126	215	546	66	118	1293	246
RTOR Reduction (vph)	0	0	19	0	0	82	0	9	0	0	15	0
Lane Group Flow (vph)	0	78	10	0	214	44	215	603	0	118	1524	0
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		18.3	34.4		18.3	18.3	10.1	53.8		9.3	53.0	
Effective Green, g (s)		18.3	34.4		18.3	18.3	10.1	53.8		9.3	53.0	
Actuated g/C Ratio		0.18	0.35		0.18	0.18	0.10	0.54		0.09	0.53	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		134	491		246	298	170	1850		161	1841	
v/s Ratio Prot			0.01			0.03	c0.13	0.18		0.07	c0.44	
v/s Ratio Perm		0.11			c0.16							
v/c Ratio		0.58	0.02		0.87	0.15	1.26	0.33		0.73	0.83	
Uniform Delay, d1		37.1	21.4		39.4	34.0	44.7	12.7		43.8	19.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.1	0.0		25.5	0.1	157.4	0.1		13.8	3.2	
Delay (s)		41.2	21.4		64.9	34.1	202.1	12.8		57.6	22.6	
Level of Service		D	C		E	C	F	B		E	C	
Approach Delay (s)		35.8			53.5			62.0			25.1	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



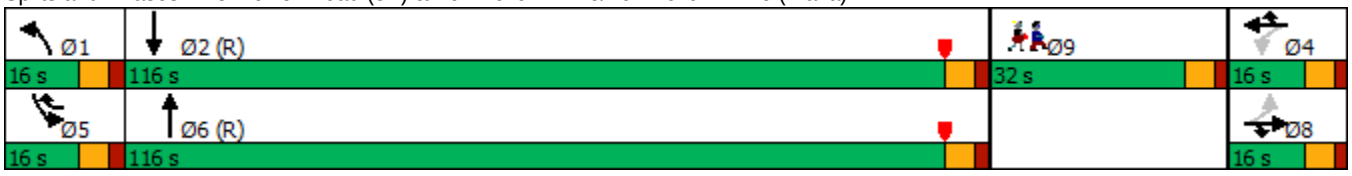
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	640	1	16	1457	3
Future Volume (vph)	11	0	48	6	0	10	4	640	1	16	1457	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1719	1583	0	1865	1669	1745	3356	0	1805	1863	0
Flt Permitted		0.752			0.748		0.950			0.950		
Satd. Flow (perm)	0	1361	1583	0	1469	1669	1745	3356	0	1805	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			55						
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Adj. Flow (vph)	14	0	60	8	0	13	4	703	1	17	1534	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	60	0	8	13	4	704	0	17	1537	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		6.3	6.3		6.3	18.3	5.0	147.7		6.0	153.1	
Actuated g/C Ratio		0.04	0.04		0.04	0.10	0.03	0.82		0.03	0.85	
v/c Ratio		0.30	0.42		0.16	0.06	0.08	0.26		0.28	0.97	
Control Delay		100.2	12.4		90.2	0.5	89.0	6.0		95.9	29.7	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	27.9	
Total Delay		100.2	12.4		90.2	0.5	89.0	6.0		95.9	57.6	
LOS		F	B		F	A	F	A		F	E	
Approach Delay		29.0			34.7			6.4			58.0	
Approach LOS		C			C			A			E	
Queue Length 50th (ft)		17	0		9	0	5	76		20	724	
Queue Length 95th (ft)		40	3		27	0	20	235		50	#2543	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		75	173		81	234	96	2753		100	1585	
Starvation Cap Reductn		0	0		0	0	0	0		0	144	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.19	0.35		0.10	0.06	0.04	0.26		0.17	1.07	

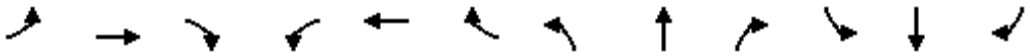
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 41.4		Intersection LOS: D	
Intersection Capacity Utilization 100.2%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	640	1	16	1457	3
Future Volume (vph)	11	0	48	6	0	10	4	640	1	16	1457	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	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	
Satd. Flow (prot)		1719	1583		1865	1669	1745	3355		1805	1862	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1362	1583		1469	1669	1745	3355		1805	1862	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	14	0	60	8	0	12	4	703	1	17	1534	3
RTOR Reduction (vph)	0	0	58	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	8	1	4	704	0	17	1537	0
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Effective Green, g (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Actuated g/C Ratio		0.03	0.03		0.03	0.09	0.01	0.78		0.02	0.80	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		47	55		51	151	9	2618		40	1484	
v/s Ratio Prot			0.00			0.00	0.00	0.21		c0.01	c0.83	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.30	0.04		0.16	0.01	0.44	0.27		0.42	1.04	
Uniform Delay, d1		84.7	83.9		84.3	74.5	89.2	5.5		86.9	18.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3	0.1		0.5	0.0	12.2	0.3		2.6	33.1	
Delay (s)		86.0	84.0		84.8	74.5	101.4	5.7		89.5	51.4	
Level of Service		F	F		F	E	F	A		F	D	
Approach Delay (s)		84.4			78.4			6.3			51.8	
Approach LOS		F			E			A			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	256	81	567	93	71	1226	
Future Volume (vph)	256	81	567	93	71	1226	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.981				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1787	1524	1839	0	1719	1863	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1524	1839	0	1719	1863	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29	7				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.96	
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%	
Adj. Flow (vph)	291	92	616	101	74	1277	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	291	92	717	0	74	1277	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	43.5	60.2	110.8		10.8	127.5	
Actuated g/C Ratio	0.23	0.32	0.58		0.06	0.67	
v/c Ratio	0.71	0.18	0.67		0.76	1.02	
Control Delay	75.3	36.8	30.5		125.3	61.5	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	4.7		0.0	0.0	
Total Delay	75.3	36.8	35.2		125.3	61.5	
LOS	E	D	D		F	E	
Approach Delay	66.1		35.2			65.0	
Approach LOS	E		D			E	
Queue Length 50th (ft)	334	53	592		90	1459	
Queue Length 95th (ft)	#695	129	750		#233	#2008	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	408	503	1074		97	1250	
Starvation Cap Reductn	0	0	281		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.71	0.18	0.90		0.76	1.02	

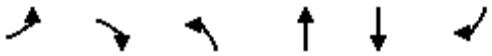
Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 56.4		Intersection LOS: E	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	256	81	567	93	71	1226
Future Volume (vph)	256	81	567	93	71	1226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1524	1839		1719	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1524	1839		1719	1863
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.96
Adj. Flow (vph)	291	92	616	101	74	1277
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	291	72	714	0	74	1277
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	43.5	60.3	105.9		10.8	122.7
Effective Green, g (s)	43.5	60.3	105.9		10.8	122.7
Actuated g/C Ratio	0.23	0.32	0.56		0.06	0.65
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	409	483	1025		97	1203
v/s Ratio Prot	c0.16	0.05	0.39		0.04	c0.69
v/s Ratio Perm						
v/c Ratio	0.71	0.15	0.70		0.76	1.06
Uniform Delay, d1	67.5	46.5	30.4		88.3	33.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.8	0.1	3.9		26.7	43.9
Delay (s)	72.3	46.5	34.3		115.1	77.6
Level of Service	E	D	C		F	E
Approach Delay (s)	66.1		34.3			79.6
Approach LOS	E		C			E

Intersection Summary			
HCM 2000 Control Delay	64.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	23	0	658	1485	10
Future Volume (vph)	0	23	0	658	1485	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1827	1863	1468
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1827	1863	1468
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	2%	10%
Adj. Flow (vph)	0	26	0	731	1650	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	26	0	731	1650	11
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

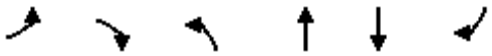
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	658	1485	10
Future Vol, veh/h	0	23	0	658	1485	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	2	10
Mvmt Flow	0	26	0	731	1650	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1650	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	123	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	123	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.8	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	123	-	-
HCM Lane V/C Ratio	-	0.208	-	-
HCM Control Delay (s)	-	41.8	-	-
HCM Lane LOS	-	E	-	-
HCM 95th %tile Q(veh)	-	0.7	-	-

APPENDIX H

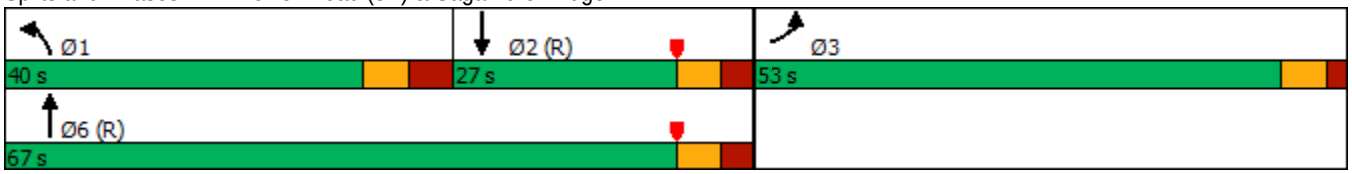


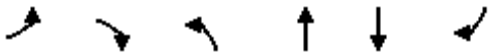
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1486	1467	1331	687	501	1238
Future Volume (vph)	1486	1467	1331	687	501	1238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1300
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.96	0.96	0.94	0.94	0.89	0.89
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Adj. Flow (vph)	1548	1528	1416	731	563	1391
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1548	1528	1416	731	563	1391
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	53.0		40.0	67.0	27.0	
Total Split (%)	44.2%		33.3%	55.8%	22.5%	
Maximum Green (s)	47.0		32.0	60.0	20.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	47.0	120.0	32.0	60.0	20.0	120.0
Actuated g/C Ratio	0.39	1.00	0.27	0.50	0.17	1.00
v/c Ratio	1.07	0.90	1.05	0.40	0.94	0.49
Control Delay	80.1	9.3	73.4	15.0	64.0	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	9.3	73.4	15.0	64.0	1.8
LOS	F	A	E	B	E	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	45.0			53.5	19.7	
Approach LOS	D			D	B	
Queue Length 50th (ft)	~684	0	~433	222	245	59
Queue Length 95th (ft)	#820	#5	#523	m227	#343	39
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1448	1689	1344	1805	601	2814
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	1.07	0.90	1.05	0.40	0.94	0.49

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 40.6		Intersection LOS: D	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			
~ 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: 4: Lowell Road (3A) & Sagamore Bridge

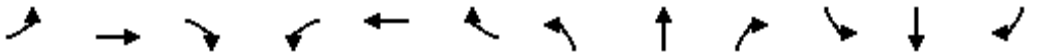




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1486	1467	1331	687	501	1238
Future Volume (vph)	1486	1467	1331	687	501	1238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.89	0.89
Adj. Flow (vph)	1548	1528	1416	731	563	1391
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1548	1528	1416	731	563	1391
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	47.0	120.0	32.0	60.0	20.0	120.0
Effective Green, g (s)	47.0	120.0	32.0	60.0	20.0	120.0
Actuated g/C Ratio	0.39	1.00	0.27	0.50	0.17	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1448	1689	1344	1805	601	2814
v/s Ratio Prot	c0.42		0.28	0.20	0.16	
v/s Ratio Perm		c0.90				0.49
v/c Ratio	1.07	0.90	1.05	0.40	0.94	0.49
Uniform Delay, d1	36.5	0.0	44.0	18.8	49.4	0.0
Progression Factor	1.00	1.00	0.85	0.77	0.92	1.00
Incremental Delay, d2	44.5	8.4	36.4	0.5	17.8	0.4
Delay (s)	81.0	8.4	73.8	14.9	63.4	0.4
Level of Service	F	A	E	B	E	A
Approach Delay (s)	45.0			53.8	18.6	
Approach LOS	D			D	B	

Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

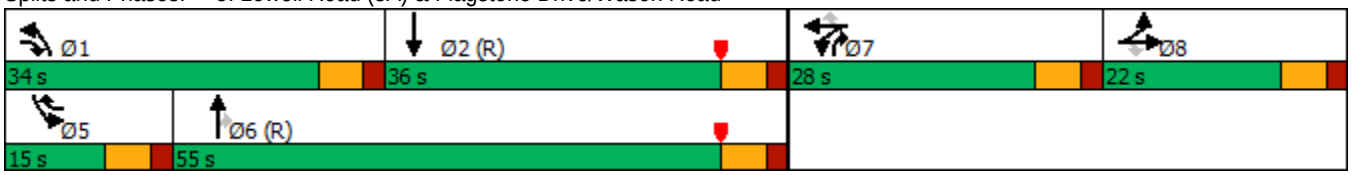


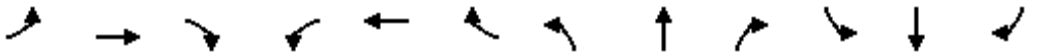
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	92	434	435	17	28	144	1064	988	72	903	5
Future Volume (vph)	52	92	434	435	17	28	144	1064	988	72	903	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.982		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Flt Permitted		0.982		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			136			567		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Adj. Flow (vph)	65	115	543	483	19	31	153	1132	1051	82	1026	6
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	180	543	251	251	31	153	1132	1051	82	1032	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	22.0	22.0	34.0	28.0	28.0	15.0	34.0	55.0	28.0	15.0	36.0	
Total Split (%)	18.3%	18.3%	28.3%	23.3%	23.3%	12.5%	28.3%	45.8%	23.3%	12.5%	30.0%	
Maximum Green (s)	16.0	16.0	28.0	22.0	22.0	9.0	28.0	49.0	22.0	9.0	30.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		14.6	44.9	22.1	22.1	30.5	24.3	53.3	81.4	8.4	34.9	
Actuated g/C Ratio		0.12	0.37	0.18	0.18	0.25	0.20	0.44	0.68	0.07	0.29	
v/c Ratio		0.79	0.84	0.82	0.82	0.06	0.42	0.71	0.50	0.65	0.69	
Control Delay		75.6	40.6	69.4	68.7	0.2	58.4	28.8	2.3	77.7	41.7	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		75.6	40.6	69.4	68.7	0.2	58.4	28.8	2.3	77.7	41.7	
LOS		E	D	E	E	A	E	C	A	E	D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		49.3			65.0			18.8			44.4	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)		136	318	198	198	0	121	252	17	63	267	
Queue Length 95th (ft)		188	366	#344	#343	0	m139	m254	m25	#123	320	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		248	696	311	313	501	416	1592	2118	135	1494	
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		0.73	0.78	0.81	0.80	0.06	0.37	0.71	0.50	0.61	0.69	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 64 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 34.8		Intersection LOS: C	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	92	434	435	17	28	144	1064	988	72	903	5
Future Volume (vph)	52	92	434	435	17	28	144	1064	988	72	903	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	
Flt Permitted		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	65	115	542	483	19	31	153	1132	1051	82	1026	6
RTOR Reduction (vph)	0	0	55	0	0	23	0	0	216	0	1	0
Lane Group Flow (vph)	0	180	488	251	251	8	153	1132	835	82	1031	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		14.6	38.9	22.1	22.1	29.3	24.3	52.1	74.2	7.2	35.0	
Effective Green, g (s)		14.6	38.9	22.1	22.1	29.3	24.3	52.1	74.2	7.2	35.0	
Actuated g/C Ratio		0.12	0.32	0.18	0.18	0.24	0.20	0.43	0.62	0.06	0.29	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		227	598	305	307	377	361	1551	1899	108	1496	
v/s Ratio Prot		0.10	c0.17	c0.15	0.15	0.00	0.09	c0.32	0.08	0.05	0.20	
v/s Ratio Perm			0.14			0.00			0.21			
v/c Ratio		0.79	0.82	0.82	0.82	0.02	0.42	0.73	0.44	0.76	0.69	
Uniform Delay, d1		51.2	37.3	47.1	47.0	34.4	41.7	28.1	12.0	55.5	37.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.38	0.94	0.43	1.00	1.00	
Incremental Delay, d2		16.6	8.2	15.9	15.1	0.0	0.3	1.6	0.1	24.8	2.6	
Delay (s)		67.8	45.5	63.0	62.1	34.5	57.7	28.2	5.2	80.4	40.3	
Level of Service		E	D	E	E	C	E	C	A	F	D	
Approach Delay (s)		51.0			60.9			19.8			43.2	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

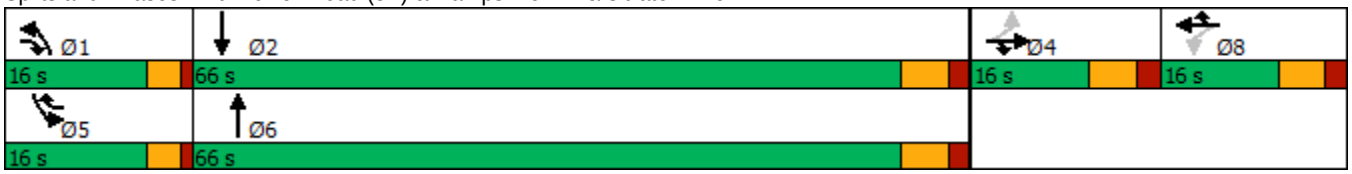
c Critical Lane Group

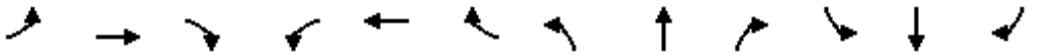
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	2	105	10	1	4	16	1126	12	5	878	7
Future Volume (vph)	26	2	105	10	1	4	16	1126	12	5	878	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.998			0.999	
Flt Protected		0.956			0.956		0.950			0.950		
Satd. Flow (prot)	0	1816	1583	0	1877	1669	1736	3567	0	1745	3571	0
Flt Permitted		0.436					0.950			0.950		
Satd. Flow (perm)	0	828	1583	0	1963	1669	1736	3567	0	1745	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			86		1			1	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Adj. Flow (vph)	33	3	131	13	1	5	17	1185	13	6	1009	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	131	0	14	5	17	1198	0	6	1017	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		8.8	16.8		6.7	9.6	5.6	39.8		5.1	31.4	
Actuated g/C Ratio		0.13	0.25		0.10	0.14	0.08	0.59		0.08	0.47	
v/c Ratio		0.33	0.27		0.07	0.02	0.12	0.57		0.05	0.61	
Control Delay		41.7	5.7		35.8	0.0	37.8	11.3		38.2	15.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		41.7	5.7		35.8	0.0	37.8	11.3		38.2	15.8	
LOS		D	A		D	A	D	B		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.4			26.4			11.7			16.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		10	0		4	0	5	99		2	125	
Queue Length 95th (ft)		47	26		24	0	31	334		16	261	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		131	592		311	410	330	3134		332	3138	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.27	0.22		0.05	0.01	0.05	0.38		0.02	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 67			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 13.7		Intersection LOS: B	
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	2	105	10	1	4	16	1126	12	5	878	7
Future Volume (vph)	26	2	105	10	1	4	16	1126	12	5	878	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817	1583		1876	1669	1736	3569		1745	3570	
Flt Permitted		0.44	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		828	1583		1963	1669	1736	3569		1745	3570	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	32	2	131	12	1	5	17	1185	13	6	1009	8
RTOR Reduction (vph)	0	0	105	0	0	4	0	0	0	0	1	0
Lane Group Flow (vph)	0	36	26	0	14	1	17	1198	0	6	1016	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		8.8	14.4		2.4	9.2	5.6	39.9		0.8	35.1	
Effective Green, g (s)		8.8	14.4		2.4	9.2	5.6	39.9		0.8	35.1	
Actuated g/C Ratio		0.12	0.19		0.03	0.12	0.08	0.54		0.01	0.47	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		98	308		63	207	131	1926		18	1695	
v/s Ratio Prot			0.02			0.00	c0.01	c0.34		0.00	0.28	
v/s Ratio Perm		c0.04			c0.01							
v/c Ratio		0.37	0.08		0.22	0.00	0.13	0.62		0.33	0.60	
Uniform Delay, d1		30.0	24.3		34.8	28.3	31.9	11.8		36.3	14.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3	0.1		1.8	0.0	0.2	0.6		3.9	0.6	
Delay (s)		32.3	24.5		36.6	28.3	32.0	12.4		40.2	14.8	
Level of Service		C	C		D	C	C	B		D	B	
Approach Delay (s)		26.2			34.4			12.7			15.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	73.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

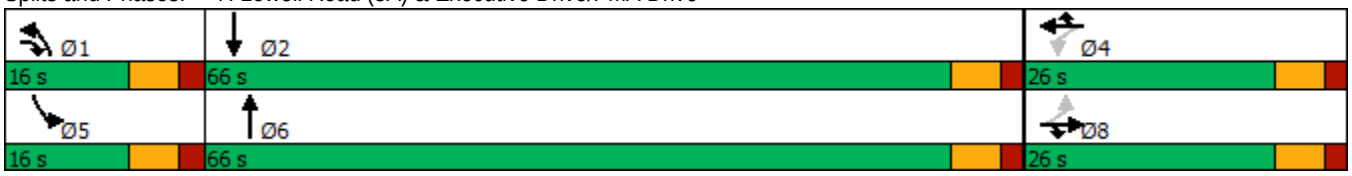
c Critical Lane Group

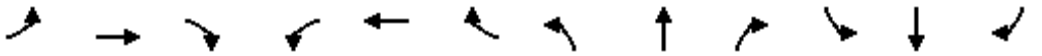
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	3	80	23	2	22	56	1030	7	16	721	40
Future Volume (vph)	236	3	80	23	2	22	56	1030	7	16	721	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.999			0.992	
Flt Protected		0.953			0.957		0.950			0.950		
Satd. Flow (prot)	0	1733	1742	0	1818	1620	1678	3571	0	1646	3540	0
Flt Permitted		0.705			0.667		0.950			0.950		
Satd. Flow (perm)	0	1282	1742	0	1267	1620	1678	3571	0	1646	3540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			91		1			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	4%	1%	0%	6%	1%	4%
Adj. Flow (vph)	295	4	100	29	3	28	58	1062	7	17	784	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	299	100	0	32	28	58	1069	0	17	827	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		20.6	33.8		20.6	20.6	6.9	33.4		5.4	25.2	
Actuated g/C Ratio		0.30	0.49		0.30	0.30	0.10	0.49		0.08	0.37	
v/c Ratio		0.77	0.11		0.08	0.05	0.34	0.61		0.13	0.63	
Control Delay		42.2	3.8		23.1	0.2	37.7	14.6		36.5	20.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		42.2	3.8		23.1	0.2	37.7	14.6		36.5	20.4	
LOS		D	A		C	A	D	B		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		32.6			12.4			15.8			20.7	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		113	0		10	0	23	145		7	151	
Queue Length 95th (ft)		#277	21		33	0	66	282		29	217	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		386	990		381	551	252	3098		247	3072	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.77	0.10		0.08	0.05	0.23	0.35		0.07	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 68.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: Lowell Road (3A) & Executive Drive/PMA Drive

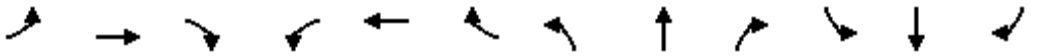




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	3	80	23	2	22	56	1030	7	16	721	40
Future Volume (vph)	236	3	80	23	2	22	56	1030	7	16	721	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733	1742		1818	1620	1678	3571		1646	3541	
Flt Permitted		0.71	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1283	1742		1267	1620	1678	3571		1646	3541	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	295	4	100	29	2	28	58	1062	7	17	784	43
RTOR Reduction (vph)	0	0	56	0	0	20	0	1	0	0	5	0
Lane Group Flow (vph)	0	299	44	0	32	8	58	1068	0	17	822	0
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	4%	1%	0%	6%	1%	4%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		20.6	32.3		20.6	20.6	5.7	33.4		1.1	28.8	
Effective Green, g (s)		20.6	32.3		20.6	20.6	5.7	33.4		1.1	28.8	
Actuated g/C Ratio		0.28	0.44		0.28	0.28	0.08	0.46		0.02	0.39	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		361	769		357	456	130	1631		24	1395	
v/s Ratio Prot			0.03			0.00	c0.03	c0.30		0.01	0.23	
v/s Ratio Perm		c0.23			0.03							
v/c Ratio		0.83	0.06		0.09	0.02	0.45	0.66		0.71	0.59	
Uniform Delay, d1		24.6	11.7		19.3	18.9	32.2	15.4		35.8	17.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.8	0.0		0.0	0.0	0.9	1.0		56.1	0.6	
Delay (s)		38.4	11.7		19.4	19.0	33.1	16.3		92.0	18.1	
Level of Service		D	B		B	B	C	B		F	B	
Approach Delay (s)		31.7			19.2			17.2			19.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



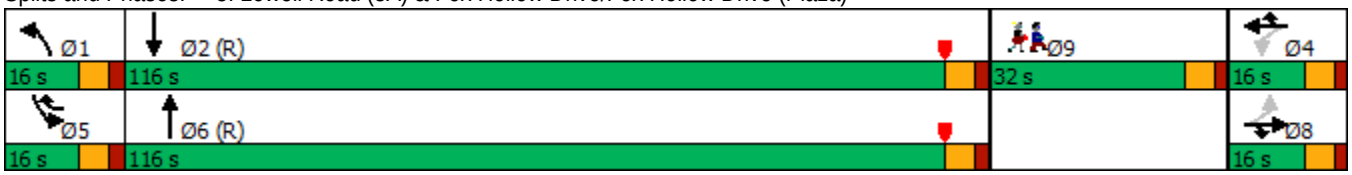
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1226	15	56	740	11
Future Volume (vph)	9	2	25	31	0	48	27	1226	15	56	740	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.998			0.998	
Flt Protected		0.962			0.950		0.950			0.950		
Satd. Flow (prot)	0	1828	1583	0	1865	1669	1745	3449	0	1805	1878	0
Flt Permitted		0.746			0.748		0.950			0.950		
Satd. Flow (perm)	0	1417	1583	0	1469	1669	1745	3449	0	1805	1878	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			60		1			1	
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	11	3	31	39	0	60	27	1238	15	60	787	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	31	0	39	60	27	1253	0	60	799	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		8.8	8.8		8.8	24.8	6.6	136.8		10.0	142.4	
Actuated g/C Ratio		0.05	0.05		0.05	0.14	0.04	0.76		0.06	0.79	
v/c Ratio		0.20	0.19		0.54	0.21	0.42	0.48		0.60	0.54	
Control Delay		87.2	2.6		109.4	14.6	103.9	11.4		106.4	12.0	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	1.5	
Total Delay		87.2	2.6		109.4	14.6	103.9	11.4		106.4	13.5	
LOS		F	A		F	B	F	B		F	B	
Approach Delay		28.9			51.9			13.4			20.0	
Approach LOS		C			D			B			B	
Queue Length 50th (ft)		16	0		46	0	32	221		71	260	
Queue Length 95th (ft)		39	0		80	34	70	586		124	807	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		84	179		87	277	96	2649		112	1490	
Starvation Cap Reductn		0	0		0	0	0	0		0	475	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.17	0.17		0.45	0.22	0.28	0.47		0.54	0.79	

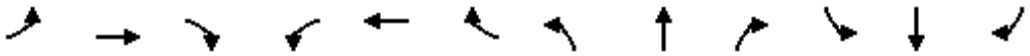
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1226	15	56	740	11
Future Volume (vph)	9	2	25	31	0	48	27	1226	15	56	740	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828	1583		1865	1669	1745	3449		1805	1877	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1417	1583		1469	1669	1745	3449		1805	1877	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Adj. Flow (vph)	11	2	31	39	0	60	27	1238	15	60	787	12
RTOR Reduction (vph)	0	0	29	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	39	8	27	1253	0	60	799	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		8.8	8.8		8.8	24.8	5.6	132.0		10.0	136.4	
Effective Green, g (s)		8.8	8.8		8.8	24.8	5.6	132.0		10.0	136.4	
Actuated g/C Ratio		0.05	0.05		0.05	0.14	0.03	0.73		0.06	0.76	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		69	77		71	229	54	2529		100	1422	
v/s Ratio Prot			0.00			0.00	0.02	0.36		c0.03	c0.43	
v/s Ratio Perm		0.01			c0.03							
v/c Ratio		0.20	0.02		0.55	0.04	0.50	0.50		0.60	0.56	
Uniform Delay, d1		82.2	81.5		83.7	67.2	85.8	10.1		83.0	9.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		4.6	0.0	2.6	0.7		6.3	1.6	
Delay (s)		82.8	81.5		88.3	67.3	88.5	10.7		89.4	10.8	
Level of Service		F	F		F	E	F	B		F	B	
Approach Delay (s)		81.9			75.5			12.4			16.3	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

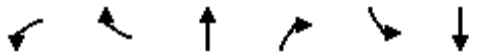
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	86	142	1166	109	110	730	
Future Volume (vph)	86	142	1166	109	110	730	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.988				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1805	1615	1922	0	1805	1881	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1805	1615	1922	0	1805	1881	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		151	4				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.87	0.87	0.98	0.98	0.89	0.89	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	
Adj. Flow (vph)	99	163	1190	111	124	820	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	99	163	1301	0	124	820	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	14.3	44.8	126.2		24.5	156.7	
Actuated g/C Ratio	0.08	0.24	0.66		0.13	0.82	
v/c Ratio	0.73	0.33	1.02		0.53	0.53	
Control Delay	114.7	12.5	60.3		82.4	9.4	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	31.2		0.0	0.0	
Total Delay	114.7	12.5	91.5		82.4	9.4	
LOS	F	B	F		F	A	
Approach Delay	51.1		91.5			19.0	
Approach LOS	D		F			B	
Queue Length 50th (ft)	123	12	1399		148	205	
Queue Length 95th (ft)	184	78	#2191		#384	750	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	190	491	1277		233	1551	
Starvation Cap Reductn	0	0	203		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.52	0.33	1.21		0.53	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 60.0		Intersection LOS: E	
Intersection Capacity Utilization 93.8%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

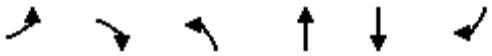
Splits and Phases: 9: Lowell Road (3A) & Pelham Road



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	86	142	1166	109	110	730
Future Volume (vph)	86	142	1166	109	110	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1923		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1923		1805	1881
Peak-hour factor, PHF	0.87	0.87	0.98	0.98	0.89	0.89
Adj. Flow (vph)	99	163	1190	111	124	820
RTOR Reduction (vph)	0	115	1	0	0	0
Lane Group Flow (vph)	99	48	1300	0	124	820
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	14.3	44.8	121.4		24.5	151.9
Effective Green, g (s)	14.3	44.8	121.4		24.5	151.9
Actuated g/C Ratio	0.08	0.24	0.64		0.13	0.80
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	135	380	1228		232	1503
v/s Ratio Prot	c0.05	0.03	c0.68		0.07	c0.44
v/s Ratio Perm						
v/c Ratio	0.73	0.13	1.06		0.53	0.55
Uniform Delay, d1	86.0	57.2	34.3		77.4	6.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.2	0.1	42.6		1.2	1.4
Delay (s)	102.1	57.2	76.9		78.6	8.2
Level of Service	F	E	E		E	A
Approach Delay (s)	74.2		76.9			17.5
Approach LOS	E		E			B

Intersection Summary			
HCM 2000 Control Delay	54.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	1288	772	16
Future Volume (vph)	0	5	0	1288	772	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1881	1881	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1881	1881	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	6	0	1431	858	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	1431	858	18
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

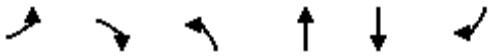
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	1288	772	16
Future Vol, veh/h	0	5	0	1288	772	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	6	0	1431	858	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	858	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	359	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	359	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	359	-	-
HCM Lane V/C Ratio	-	0.015	-	-
HCM Control Delay (s)	-	15.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0	-	-

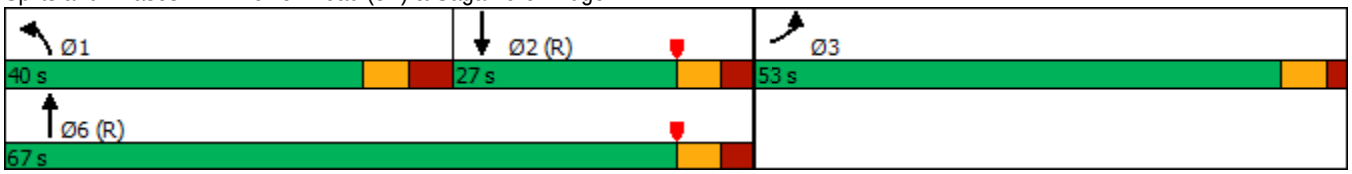


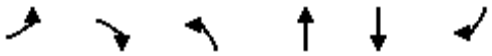
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1498	1467	1331	689	506	1266
Future Volume (vph)	1498	1467	1331	689	506	1266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1300
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.96	0.96	0.94	0.94	0.89	0.89
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Adj. Flow (vph)	1560	1528	1416	733	569	1422
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1560	1528	1416	733	569	1422
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	53.0		40.0	67.0	27.0	
Total Split (%)	44.2%		33.3%	55.8%	22.5%	
Maximum Green (s)	47.0		32.0	60.0	20.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	47.0	120.0	32.0	60.0	20.0	120.0
Actuated g/C Ratio	0.39	1.00	0.27	0.50	0.17	1.00
v/c Ratio	1.08	0.90	1.05	0.41	0.95	0.51
Control Delay	83.0	9.3	73.4	15.0	65.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.0	9.3	73.4	15.0	65.0	1.9
LOS	F	A	E	B	E	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	46.5			53.5	20.0	
Approach LOS	D			D	B	
Queue Length 50th (ft)	~694	0	~433	222	248	65
Queue Length 95th (ft)	#830	#5	#523	m227	#348	48
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1448	1689	1344	1805	601	2814
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	1.08	0.90	1.05	0.41	0.95	0.51

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 41.3		Intersection LOS: D	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ 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: 4: Lowell Road (3A) & Sagamore Bridge





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1498	1467	1331	689	506	1266
Future Volume (vph)	1498	1467	1331	689	506	1266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.89	0.89
Adj. Flow (vph)	1560	1528	1416	733	569	1422
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1560	1528	1416	733	569	1422
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	47.0	120.0	32.0	60.0	20.0	120.0
Effective Green, g (s)	47.0	120.0	32.0	60.0	20.0	120.0
Actuated g/C Ratio	0.39	1.00	0.27	0.50	0.17	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1448	1689	1344	1805	601	2814
v/s Ratio Prot	c0.42		0.28	0.20	0.16	
v/s Ratio Perm		c0.90				0.51
v/c Ratio	1.08	0.90	1.05	0.41	0.95	0.51
Uniform Delay, d1	36.5	0.0	44.0	18.8	49.5	0.0
Progression Factor	1.00	1.00	0.85	0.77	0.92	1.00
Incremental Delay, d2	47.5	8.4	36.4	0.5	18.9	0.4
Delay (s)	84.0	8.4	73.8	14.9	64.5	0.4
Level of Service	F	A	E	B	E	A
Approach Delay (s)	46.6			53.7	18.7	
Approach LOS	D			D	B	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

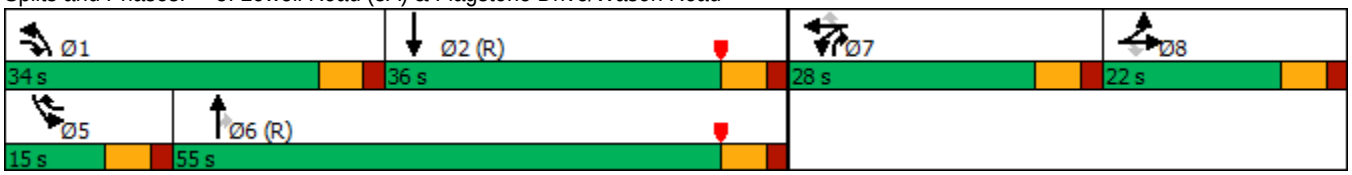
c Critical Lane Group

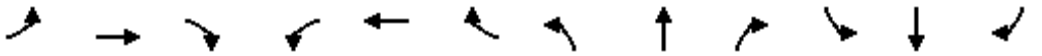
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	92	434	435	17	28	151	1071	988	72	936	5
Future Volume (vph)	52	92	434	435	17	28	151	1071	988	72	936	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.982		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Flt Permitted		0.982		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1866	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			136			567		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Adj. Flow (vph)	65	115	543	483	19	31	161	1139	1051	82	1064	6
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	180	543	251	251	31	161	1139	1051	82	1070	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	22.0	22.0	34.0	28.0	28.0	15.0	34.0	55.0	28.0	15.0	36.0	
Total Split (%)	18.3%	18.3%	28.3%	23.3%	23.3%	12.5%	28.3%	45.8%	23.3%	12.5%	30.0%	
Maximum Green (s)	16.0	16.0	28.0	22.0	22.0	9.0	28.0	49.0	22.0	9.0	30.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		14.6	45.0	21.9	21.9	30.4	24.4	53.5	81.4	8.4	35.1	
Actuated g/C Ratio		0.12	0.38	0.18	0.18	0.25	0.20	0.45	0.68	0.07	0.29	
v/c Ratio		0.79	0.84	0.83	0.83	0.06	0.44	0.72	0.50	0.65	0.71	
Control Delay		75.6	40.4	70.3	69.6	0.2	58.8	28.6	2.3	77.7	42.2	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		75.6	40.4	70.3	69.6	0.2	58.8	28.6	2.3	77.7	42.2	
LOS		E	D	E	E	A	E	C	A	E	D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		49.2			65.9			18.9			44.8	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)		136	318	198	198	0	128	253	17	63	279	
Queue Length 95th (ft)		188	366	#344	#343	0	m145	m253	m25	#123	334	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		248	696	308	310	499	416	1592	2118	135	1499	
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		0.73	0.78	0.81	0.81	0.06	0.39	0.72	0.50	0.61	0.71	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 64 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 35.0		Intersection LOS: D	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	92	434	435	17	28	151	1071	988	72	936	5
Future Volume (vph)	52	92	434	435	17	28	151	1071	988	72	936	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1866	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Flt Permitted		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1866	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	65	115	542	483	19	31	161	1139	1051	82	1064	6
RTOR Reduction (vph)	0	0	55	0	0	23	0	0	216	0	1	0
Lane Group Flow (vph)	0	180	488	251	251	8	161	1139	835	82	1069	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		14.6	39.0	21.9	21.9	29.1	24.4	52.3	74.2	7.2	35.1	
Effective Green, g (s)		14.6	39.0	21.9	21.9	29.1	24.4	52.3	74.2	7.2	35.1	
Actuated g/C Ratio		0.12	0.32	0.18	0.18	0.24	0.20	0.44	0.62	0.06	0.29	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		227	599	302	304	374	363	1557	1899	108	1501	
v/s Ratio Prot		0.10	c0.17	c0.15	0.15	0.00	0.09	c0.32	0.08	0.05	0.21	
v/s Ratio Perm			0.14			0.00			0.21			
v/c Ratio		0.79	0.81	0.83	0.83	0.02	0.44	0.73	0.44	0.76	0.71	
Uniform Delay, d1		51.2	37.2	47.3	47.2	34.6	41.9	28.0	12.0	55.5	37.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.38	0.94	0.43	1.00	1.00	
Incremental Delay, d2		16.6	8.1	17.1	16.2	0.0	0.3	1.6	0.1	24.8	2.9	
Delay (s)		67.8	45.3	64.4	63.4	34.6	57.9	28.0	5.2	80.4	40.8	
Level of Service		E	D	E	E	C	E	C	A	F	D	
Approach Delay (s)		50.9			62.2			19.8			43.7	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

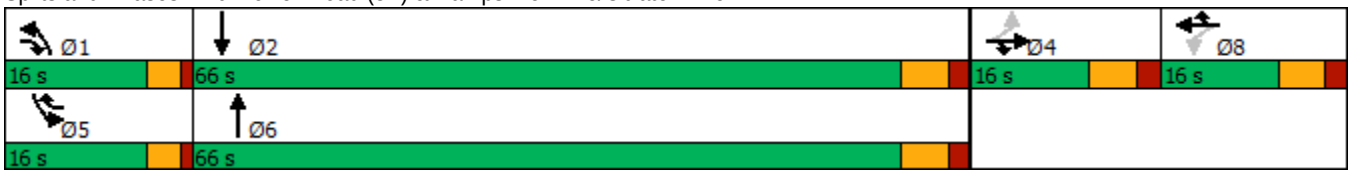
c Critical Lane Group

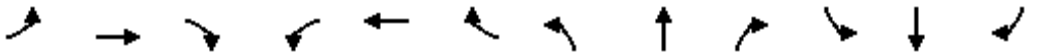
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	2	105	10	1	4	17	1132	12	5	911	7
Future Volume (vph)	26	2	105	10	1	4	17	1132	12	5	911	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.998			0.999	
Flt Protected		0.956			0.956		0.950			0.950		
Satd. Flow (prot)	0	1816	1583	0	1877	1669	1736	3567	0	1745	3571	0
Flt Permitted		0.436					0.950			0.950		
Satd. Flow (perm)	0	828	1583	0	1963	1669	1736	3567	0	1745	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			86		1			1	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Adj. Flow (vph)	33	3	131	13	1	5	18	1192	13	6	1047	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	131	0	14	5	18	1205	0	6	1055	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		8.8	16.8		6.7	9.6	5.6	40.5		5.1	32.0	
Actuated g/C Ratio		0.13	0.25		0.10	0.14	0.08	0.60		0.08	0.47	
v/c Ratio		0.34	0.27		0.07	0.02	0.12	0.56		0.05	0.62	
Control Delay		42.3	5.7		36.2	0.0	38.2	11.3		38.6	16.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		42.3	5.7		36.2	0.0	38.2	11.3		38.6	16.1	
LOS		D	A		D	A	D	B		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.6			26.7			11.7			16.2	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		10	0		4	0	6	100		2	132	
Queue Length 95th (ft)		47	26		24	0	33	337		16	275	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		130	587		308	407	327	3124		328	3127	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.28	0.22		0.05	0.01	0.06	0.39		0.02	0.34	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 67.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive

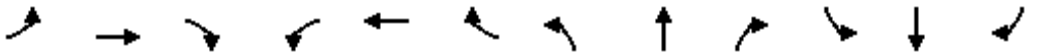




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	2	105	10	1	4	17	1132	12	5	911	7
Future Volume (vph)	26	2	105	10	1	4	17	1132	12	5	911	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1817	1583		1876	1669	1736	3569		1745	3570	
Flt Permitted		0.44	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		828	1583		1963	1669	1736	3569		1745	3570	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	32	2	131	12	1	5	18	1192	13	6	1047	8
RTOR Reduction (vph)	0	0	106	0	0	4	0	0	0	0	1	0
Lane Group Flow (vph)	0	36	25	0	14	1	18	1205	0	6	1054	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		8.8	14.4		2.4	9.2	5.6	40.5		0.8	35.7	
Effective Green, g (s)		8.8	14.4		2.4	9.2	5.6	40.5		0.8	35.7	
Actuated g/C Ratio		0.12	0.19		0.03	0.12	0.08	0.54		0.01	0.48	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		97	305		63	206	130	1940		18	1710	
v/s Ratio Prot			0.02			0.00	c0.01	c0.34		0.00	0.30	
v/s Ratio Perm		c0.04			c0.01							
v/c Ratio		0.37	0.08		0.22	0.00	0.14	0.62		0.33	0.62	
Uniform Delay, d1		30.3	24.6		35.1	28.6	32.2	11.7		36.6	14.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4	0.1		1.8	0.0	0.2	0.6		3.9	0.7	
Delay (s)		32.7	24.8		36.9	28.6	32.4	12.3		40.5	15.0	
Level of Service		C	C		D	C	C	B		D	B	
Approach Delay (s)		26.5			34.7			12.6			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

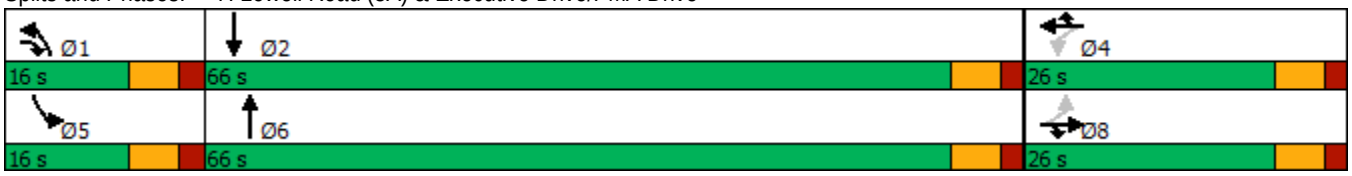


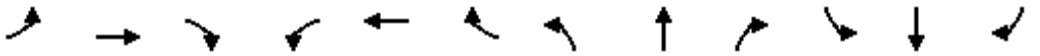
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	3	82	23	2	22	62	1030	7	16	752	40
Future Volume (vph)	242	3	82	23	2	22	62	1030	7	16	752	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.999			0.992	
Flt Protected		0.953			0.957		0.950			0.950		
Satd. Flow (prot)	0	1733	1708	0	1818	1620	1631	3571	0	1646	3540	0
Flt Permitted		0.705			0.663		0.950			0.950		
Satd. Flow (perm)	0	1282	1708	0	1260	1620	1631	3571	0	1646	3540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103			91		1			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	4%	0%	0%	3%	7%	1%	0%	6%	1%	4%
Adj. Flow (vph)	303	4	103	29	3	28	64	1062	7	17	817	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	307	103	0	32	28	64	1069	0	17	860	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		20.6	34.0		20.6	20.6	7.1	34.1		5.4	25.7	
Actuated g/C Ratio		0.30	0.49		0.30	0.30	0.10	0.49		0.08	0.37	
v/c Ratio		0.80	0.12		0.09	0.05	0.38	0.61		0.13	0.65	
Control Delay		45.3	3.8		23.5	0.2	39.1	14.4		36.9	20.7	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		45.3	3.8		23.5	0.2	39.1	14.4		36.9	20.7	
LOS		D	A		C	A	D	B		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		34.9			12.6			15.8			21.0	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		121	0		10	0	26	145		7	160	
Queue Length 95th (ft)		#286	21		33	0	72	282		29	228	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		382	964		375	546	243	3064		245	3039	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.80	0.11		0.09	0.05	0.26	0.35		0.07	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 69.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: Lowell Road (3A) & Executive Drive/PMA Drive

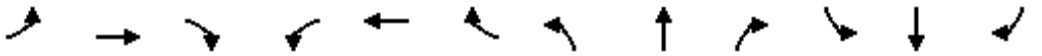




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	3	82	23	2	22	62	1030	7	16	752	40
Future Volume (vph)	242	3	82	23	2	22	62	1030	7	16	752	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733	1708		1818	1620	1631	3571		1646	3542	
Flt Permitted		0.71	1.00		0.66	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1283	1708		1259	1620	1631	3571		1646	3542	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	302	4	102	29	2	28	64	1062	7	17	817	43
RTOR Reduction (vph)	0	0	58	0	0	20	0	1	0	0	5	0
Lane Group Flow (vph)	0	307	45	0	32	8	64	1068	0	17	855	0
Heavy Vehicles (%)	1%	0%	4%	0%	0%	3%	7%	1%	0%	6%	1%	4%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		20.6	32.5		20.6	20.6	5.9	34.1		1.1	29.3	
Effective Green, g (s)		20.6	32.5		20.6	20.6	5.9	34.1		1.1	29.3	
Actuated g/C Ratio		0.28	0.44		0.28	0.28	0.08	0.46		0.01	0.40	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		358	752		351	452	130	1650		24	1406	
v/s Ratio Prot			0.03			0.00	c0.04	c0.30		0.01	0.24	
v/s Ratio Perm		c0.24			0.03							
v/c Ratio		0.86	0.06		0.09	0.02	0.49	0.65		0.71	0.61	
Uniform Delay, d1		25.2	11.9		19.7	19.3	32.5	15.2		36.2	17.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		17.4	0.0		0.0	0.0	1.1	0.9		56.1	0.8	
Delay (s)		42.6	11.9		19.7	19.3	33.6	16.1		92.3	18.4	
Level of Service		D	B		B	B	C	B		F	B	
Approach Delay (s)		34.9			19.5			17.1			19.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



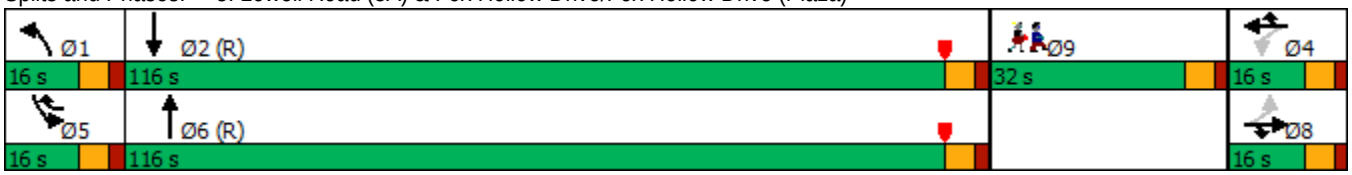
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1232	15	56	742	11
Future Volume (vph)	9	2	25	31	0	48	27	1232	15	56	742	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.998			0.998	
Flt Protected		0.962			0.950		0.950			0.950		
Satd. Flow (prot)	0	1828	1583	0	1865	1669	1745	3449	0	1805	1878	0
Flt Permitted		0.746			0.748		0.950			0.950		
Satd. Flow (perm)	0	1417	1583	0	1469	1669	1745	3449	0	1805	1878	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			60		1			1	
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	11	3	31	39	0	60	27	1244	15	60	789	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	31	0	39	60	27	1259	0	60	801	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		8.8	8.8		8.8	24.8	6.6	136.8		10.0	142.4	
Actuated g/C Ratio		0.05	0.05		0.05	0.14	0.04	0.76		0.06	0.79	
v/c Ratio		0.20	0.19		0.54	0.21	0.42	0.48		0.60	0.54	
Control Delay		87.2	2.6		109.4	14.6	103.9	11.5		106.4	12.0	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	1.5	
Total Delay		87.2	2.6		109.4	14.6	103.9	11.5		106.4	13.5	
LOS		F	A		F	B	F	B		F	B	
Approach Delay		28.9			51.9			13.4			20.0	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)		16	0		46	0	32	222		71	261	
Queue Length 95th (ft)		39	0		80	34	70	590		124	810	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		84	179		87	277	96	2649		112	1490	
Starvation Cap Reductn		0	0		0	0	0	0		0	474	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.17	0.17		0.45	0.22	0.28	0.48		0.54	0.79	

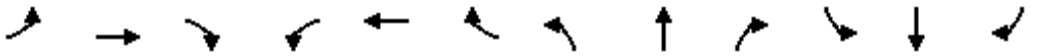
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1232	15	56	742	11
Future Volume (vph)	9	2	25	31	0	48	27	1232	15	56	742	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828	1583		1865	1669	1745	3449		1805	1877	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1417	1583		1469	1669	1745	3449		1805	1877	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Adj. Flow (vph)	11	2	31	39	0	60	27	1244	15	60	789	12
RTOR Reduction (vph)	0	0	29	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	39	8	27	1259	0	60	801	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		8.8	8.8		8.8	24.8	5.6	132.0		10.0	136.4	
Effective Green, g (s)		8.8	8.8		8.8	24.8	5.6	132.0		10.0	136.4	
Actuated g/C Ratio		0.05	0.05		0.05	0.14	0.03	0.73		0.06	0.76	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		69	77		71	229	54	2529		100	1422	
v/s Ratio Prot			0.00			0.00	0.02	0.36		c0.03	c0.43	
v/s Ratio Perm		0.01			c0.03							
v/c Ratio		0.20	0.02		0.55	0.04	0.50	0.50		0.60	0.56	
Uniform Delay, d1		82.2	81.5		83.7	67.2	85.8	10.1		83.0	9.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		4.6	0.0	2.6	0.7		6.3	1.6	
Delay (s)		82.8	81.5		88.3	67.3	88.5	10.8		89.4	10.8	
Level of Service		F	F		F	E	F	B		F	B	
Approach Delay (s)		81.9			75.5			12.4			16.3	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

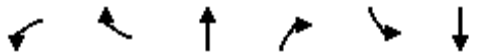
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	86	142	1172	109	110	732	
Future Volume (vph)	86	142	1172	109	110	732	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.989				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1805	1615	1924	0	1805	1881	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1805	1615	1924	0	1805	1881	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		151	4				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.87	0.87	0.98	0.98	0.89	0.89	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	
Adj. Flow (vph)	99	163	1196	111	124	822	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	99	163	1307	0	124	822	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	14.3	44.8	126.2		24.5	156.7	
Actuated g/C Ratio	0.08	0.24	0.66		0.13	0.82	
v/c Ratio	0.73	0.33	1.02		0.53	0.53	
Control Delay	114.7	12.5	61.4		82.4	9.5	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	30.3		0.0	0.0	
Total Delay	114.7	12.5	91.6		82.4	9.5	
LOS	F	B	F		F	A	
Approach Delay	51.1		91.6			19.0	
Approach LOS	D		F			B	
Queue Length 50th (ft)	123	12	1417		148	206	
Queue Length 95th (ft)	184	78	#2205		#384	754	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	190	491	1279		233	1551	
Starvation Cap Reductn	0	0	202		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.52	0.33	1.21		0.53	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 60.1		Intersection LOS: E	
Intersection Capacity Utilization 94.2%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

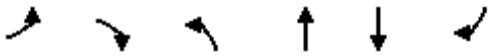
Splits and Phases: 9: Lowell Road (3A) & Pelham Road



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	86	142	1172	109	110	732
Future Volume (vph)	86	142	1172	109	110	732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1923		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1923		1805	1881
Peak-hour factor, PHF	0.87	0.87	0.98	0.98	0.89	0.89
Adj. Flow (vph)	99	163	1196	111	124	822
RTOR Reduction (vph)	0	115	1	0	0	0
Lane Group Flow (vph)	99	48	1306	0	124	822
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	14.3	44.8	121.4		24.5	151.9
Effective Green, g (s)	14.3	44.8	121.4		24.5	151.9
Actuated g/C Ratio	0.08	0.24	0.64		0.13	0.80
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	135	380	1228		232	1503
v/s Ratio Prot	c0.05	0.03	c0.68		0.07	c0.44
v/s Ratio Perm						
v/c Ratio	0.73	0.13	1.06		0.53	0.55
Uniform Delay, d1	86.0	57.2	34.3		77.4	6.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.2	0.1	44.3		1.2	1.4
Delay (s)	102.1	57.2	78.6		78.6	8.2
Level of Service	F	E	E		E	A
Approach Delay (s)	74.2		78.6			17.4
Approach LOS	E		E			B

Intersection Summary			
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	0	1294	772	18
Future Volume (vph)	0	36	0	1294	772	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1881	1881	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1881	1881	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	40	0	1438	858	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	40	0	1438	858	20
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

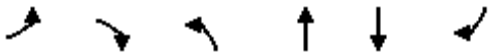
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	0	1294	772	18
Future Vol, veh/h	0	36	0	1294	772	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	40	0	1438	858	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	858	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	359	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	359	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	359	-	-
HCM Lane V/C Ratio	-	0.111	-	-
HCM Control Delay (s)	-	16.3	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

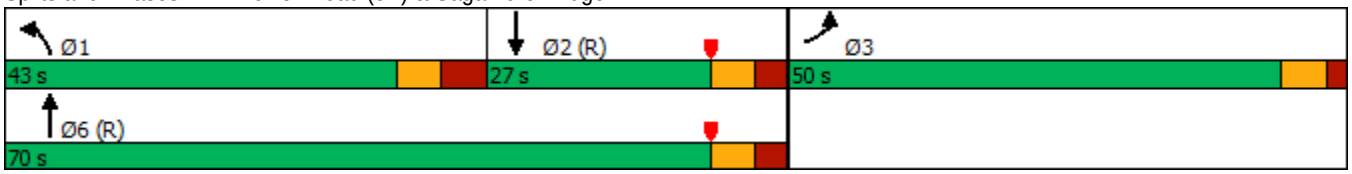


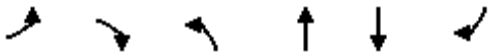
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1640	1593	1442	752	547	1365
Future Volume (vph)	1640	1593	1442	752	547	1365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1242
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.96	0.96	0.94	0.94	0.89	0.89
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Adj. Flow (vph)	1708	1659	1534	800	615	1534
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1708	1659	1534	800	615	1534
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	50.0		43.0	70.0	27.0	
Total Split (%)	41.7%		35.8%	58.3%	22.5%	
Maximum Green (s)	44.0		35.0	63.0	20.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	44.0	120.0	35.0	63.0	20.0	120.0
Actuated g/C Ratio	0.37	1.00	0.29	0.52	0.17	1.00
v/c Ratio	1.26	0.98	1.04	0.42	1.02	0.55
Control Delay	157.1	20.6	64.4	8.9	73.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	157.1	20.6	64.4	8.9	73.0	2.1
LOS	F	C	E	A	E	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	89.8			45.4	22.4	
Approach LOS	F			D	C	
Queue Length 50th (ft)	~855	0	~451	145	~253	73
Queue Length 95th (ft)	#992	#216	#550	m181	m#358	47
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1355	1689	1470	1895	601	2814
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	1.26	0.98	1.04	0.42	1.02	0.55

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 58.1		Intersection LOS: E	
Intersection Capacity Utilization 106.0%		ICU Level of Service G	
Analysis Period (min) 15			
~ 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: 4: Lowell Road (3A) & Sagamore Bridge

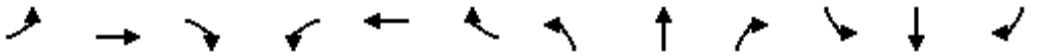




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1640	1593	1442	752	547	1365
Future Volume (vph)	1640	1593	1442	752	547	1365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.89	0.89
Adj. Flow (vph)	1708	1659	1534	800	615	1534
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1708	1659	1534	800	615	1534
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	44.0	120.0	35.0	63.0	20.0	120.0
Effective Green, g (s)	44.0	120.0	35.0	63.0	20.0	120.0
Actuated g/C Ratio	0.37	1.00	0.29	0.52	0.17	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1355	1689	1470	1895	601	2814
v/s Ratio Prot	c0.46		0.30	0.22	0.17	
v/s Ratio Perm		c0.98				0.55
v/c Ratio	1.26	0.98	1.04	0.42	1.02	0.55
Uniform Delay, d1	38.0	0.0	42.5	17.4	50.0	0.0
Progression Factor	1.00	1.00	0.77	0.48	0.80	1.00
Incremental Delay, d2	123.3	18.1	31.6	0.5	32.5	0.4
Delay (s)	161.3	18.1	64.1	8.8	72.6	0.4
Level of Service	F	B	E	A	E	A
Approach Delay (s)	90.7			45.2	21.1	
Approach LOS	F			D	C	

Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

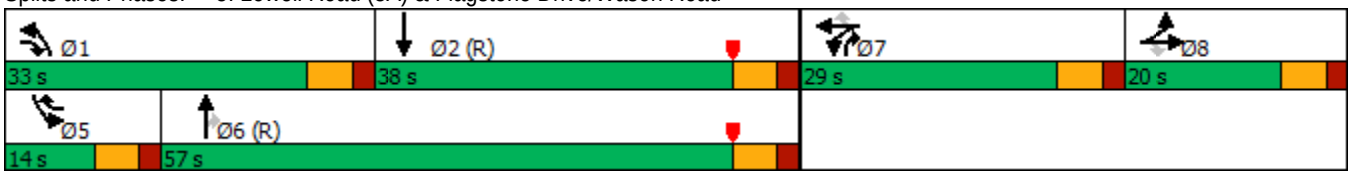


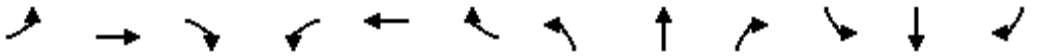
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	98	475	479	19	31	153	1171	1093	80	991	5
Future Volume (vph)	54	98	475	479	19	31	153	1171	1093	80	991	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.983		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1868	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Flt Permitted		0.983		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1868	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			136			424		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Adj. Flow (vph)	68	123	594	532	21	34	163	1246	1163	91	1126	6
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	191	594	277	276	34	163	1246	1163	91	1132	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	20.0	20.0	33.0	29.0	29.0	14.0	33.0	57.0	29.0	14.0	38.0	
Total Split (%)	16.7%	16.7%	27.5%	24.2%	24.2%	11.7%	27.5%	47.5%	24.2%	11.7%	31.7%	
Maximum Green (s)	14.0	14.0	27.0	23.0	23.0	8.0	27.0	51.0	23.0	8.0	32.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		13.8	45.7	23.2	23.2	31.0	25.9	51.2	80.4	7.9	33.2	
Actuated g/C Ratio		0.12	0.38	0.19	0.19	0.26	0.22	0.43	0.67	0.07	0.28	
v/c Ratio		0.90	0.90	0.87	0.86	0.07	0.42	0.82	0.57	0.77	0.80	
Control Delay		92.1	48.3	73.5	72.3	0.3	58.4	19.5	0.6	93.6	45.6	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		92.1	48.3	73.5	72.3	0.3	58.4	19.5	0.6	93.6	45.6	
LOS		F	D	E	E	A	E	B	A	F	D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		58.9			68.7			13.4			49.2	
Approach LOS		E			E			B			D	
Queue Length 50th (ft)		148	374	221	220	0	117	202	4	71	302	
Queue Length 95th (ft)		#232	441	#382	#378	0	m123	m162	m1	#155	349	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		217	673	319	321	502	402	1525	2044	120	1418	
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		0.88	0.88	0.87	0.86	0.07	0.41	0.82	0.57	0.76	0.80	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 74 (62%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 77.4%		ICU Level of Service D	
Analysis Period (min) 15			
# 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	98	475	479	19	31	153	1171	1093	80	991	5
Future Volume (vph)	54	98	475	479	19	31	153	1171	1093	80	991	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1867	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Flt Permitted		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1867	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	68	122	594	532	21	34	163	1246	1163	91	1126	6
RTOR Reduction (vph)	0	0	55	0	0	25	0	0	161	0	1	0
Lane Group Flow (vph)	0	191	539	277	276	9	163	1246	1002	91	1131	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		13.8	39.7	23.2	23.2	31.1	25.9	51.1	74.3	7.9	33.1	
Effective Green, g (s)		13.8	39.7	23.2	23.2	31.1	25.9	51.1	74.3	7.9	33.1	
Actuated g/C Ratio		0.12	0.33	0.19	0.19	0.26	0.22	0.43	0.62	0.07	0.28	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		214	608	320	322	400	385	1521	1901	118	1415	
v/s Ratio Prot		0.10	c0.19	c0.17	0.17	0.00	0.09	c0.35	0.10	0.05	0.22	
v/s Ratio Perm			0.15			0.00			0.25			
v/c Ratio		0.89	0.89	0.87	0.86	0.02	0.42	0.82	0.53	0.77	0.80	
Uniform Delay, d1		52.4	38.0	46.9	46.8	33.1	40.6	30.4	12.9	55.2	40.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.41	0.58	0.04	1.00	1.00	
Incremental Delay, d2		33.8	14.5	20.7	19.3	0.0	0.2	1.5	0.1	25.3	4.8	
Delay (s)		86.2	52.5	67.6	66.1	33.1	57.5	19.3	0.6	80.4	45.2	
Level of Service		F	D	E	E	C	E	B	A	F	D	
Approach Delay (s)		60.7			64.9			13.2			47.8	
Approach LOS		E			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

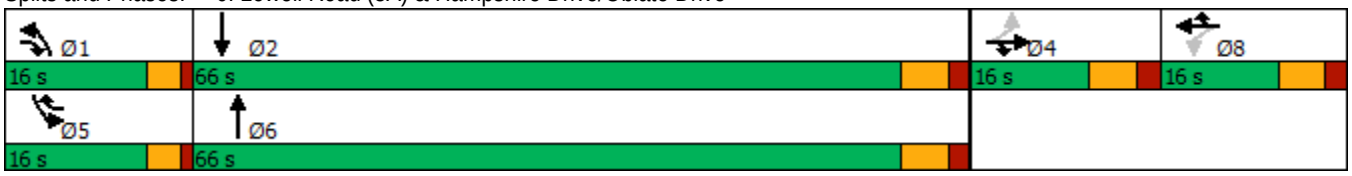
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	2	116	11	1	5	18	1236	14	6	962	8
Future Volume (vph)	28	2	116	11	1	5	18	1236	14	6	962	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.998			0.999	
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1816	1583	0	1875	1669	1736	3568	0	1745	3571	0
Flt Permitted		0.422					0.950			0.950		
Satd. Flow (perm)	0	802	1583	0	1963	1669	1736	3568	0	1745	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			86		1			1	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Adj. Flow (vph)	35	3	145	14	1	6	19	1301	15	7	1106	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	145	0	15	6	19	1316	0	7	1115	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		9.1	17.5		6.9	9.7	5.8	43.6		5.3	36.3	
Actuated g/C Ratio		0.13	0.24		0.09	0.13	0.08	0.60		0.07	0.50	
v/c Ratio		0.38	0.30		0.08	0.02	0.14	0.62		0.06	0.62	
Control Delay		49.1	6.2		40.4	0.2	42.7	12.8		43.0	15.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		49.1	6.2		40.4	0.2	42.7	12.8		43.0	15.4	
LOS		D	A		D	A	D	B		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		15.1			28.9			13.3			15.6	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		12	0		5	0	6	118		2	146	
Queue Length 95th (ft)		#55	29		27	0	36	383		18	295	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		119	573		292	386	310	3017		311	3019	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.32	0.25		0.05	0.02	0.06	0.44		0.02	0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 72.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	2	116	11	1	5	18	1236	14	6	962	8
Future Volume (vph)	28	2	116	11	1	5	18	1236	14	6	962	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1816	1583		1876	1669	1736	3569		1745	3570	
Flt Permitted		0.42	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		802	1583		1963	1669	1736	3569		1745	3570	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	35	2	145	14	1	6	19	1301	15	7	1106	9
RTOR Reduction (vph)	0	0	118	0	0	5	0	0	0	0	0	0
Lane Group Flow (vph)	0	38	27	0	15	1	19	1316	0	7	1115	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		9.1	14.9		2.3	10.0	5.8	43.6		1.7	39.5	
Effective Green, g (s)		9.1	14.9		2.3	10.0	5.8	43.6		1.7	39.5	
Actuated g/C Ratio		0.12	0.19		0.03	0.13	0.07	0.55		0.02	0.50	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		92	299		57	212	127	1977		37	1791	
v/s Ratio Prot			0.02			0.00	c0.01	c0.37		0.00	0.31	
v/s Ratio Perm		c0.05			c0.01							
v/c Ratio		0.41	0.09		0.26	0.00	0.15	0.67		0.19	0.62	
Uniform Delay, d1		32.3	26.3		37.4	30.0	34.1	12.4		37.8	14.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.0	0.1		2.5	0.0	0.2	0.9		0.9	0.7	
Delay (s)		35.3	26.5		39.8	30.0	34.3	13.3		38.7	14.9	
Level of Service		D	C		D	C	C	B		D	B	
Approach Delay (s)		28.3			37.0			13.6			15.0	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

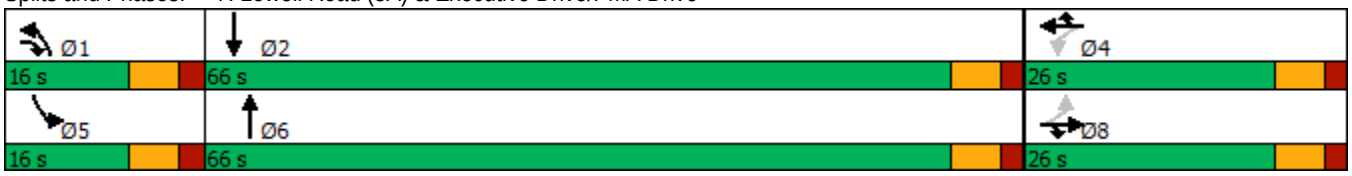
c Critical Lane Group

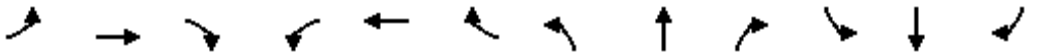
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	3	90	23	2	22	61	1131	7	16	789	44
Future Volume (vph)	259	3	90	23	2	22	61	1131	7	16	789	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.999			0.992	
Flt Protected		0.953			0.957		0.950			0.950		
Satd. Flow (prot)	0	1733	1742	0	1818	1620	1678	3571	0	1646	3540	0
Flt Permitted		0.705			0.611		0.950			0.950		
Satd. Flow (perm)	0	1282	1742	0	1161	1620	1678	3571	0	1646	3540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			91		1			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	4%	1%	0%	6%	1%	4%
Adj. Flow (vph)	324	4	113	29	3	28	63	1166	7	17	858	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	113	0	32	28	63	1173	0	17	906	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		20.7	34.1		20.7	20.7	7.2	37.0		5.5	28.5	
Actuated g/C Ratio		0.29	0.47		0.29	0.29	0.10	0.51		0.08	0.40	
v/c Ratio		0.89	0.13		0.10	0.05	0.38	0.64		0.13	0.65	
Control Delay		57.6	4.1		25.5	0.2	40.8	14.6		38.8	20.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		57.6	4.1		25.5	0.2	40.8	14.6		38.8	20.2	
LOS		E	A		C	A	D	B		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		43.9			13.7			15.9			20.5	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		139	0		10	0	26	165		7	172	
Queue Length 95th (ft)		#339	24		36	0	76	318		31	240	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		367	953		333	529	240	2984		236	2959	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.89	0.12		0.10	0.05	0.26	0.39		0.07	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 72.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 22.1		Intersection LOS: C	
Intersection Capacity Utilization 71.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: Lowell Road (3A) & Executive Drive/PMA Drive

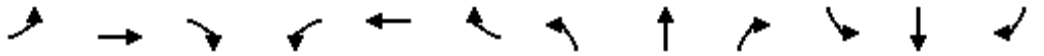




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	3	90	23	2	22	61	1131	7	16	789	44
Future Volume (vph)	259	3	90	23	2	22	61	1131	7	16	789	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733	1742		1818	1620	1678	3571		1646	3540	
Flt Permitted		0.71	1.00		0.61	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1283	1742		1161	1620	1678	3571		1646	3540	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	324	4	112	29	2	28	63	1166	7	17	858	48
RTOR Reduction (vph)	0	0	65	0	0	20	0	1	0	0	5	0
Lane Group Flow (vph)	0	328	48	0	32	8	63	1172	0	17	901	0
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%	4%	1%	0%	6%	1%	4%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		20.7	32.6		20.7	20.7	5.9	37.0		1.1	32.2	
Effective Green, g (s)		20.7	32.6		20.7	20.7	5.9	37.0		1.1	32.2	
Actuated g/C Ratio		0.27	0.42		0.27	0.27	0.08	0.48		0.01	0.42	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		345	739		312	436	128	1720		23	1484	
v/s Ratio Prot			0.03			0.00	c0.04	c0.33		0.01	0.25	
v/s Ratio Perm		c0.26			0.03							
v/c Ratio		0.95	0.06		0.10	0.02	0.49	0.68		0.74	0.61	
Uniform Delay, d1		27.5	13.1		21.1	20.6	34.0	15.4		37.7	17.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		35.3	0.0		0.1	0.0	1.1	1.1		69.6	0.7	
Delay (s)		62.9	13.1		21.1	20.6	35.1	16.5		107.3	18.1	
Level of Service		E	B		C	C	D	B		F	B	
Approach Delay (s)		50.1			20.9			17.4			19.7	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1366	15	56	809	11
Future Volume (vph)	9	2	25	31	0	48	27	1366	15	56	809	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.998			0.998	
Flt Protected		0.962			0.950		0.950			0.950		
Satd. Flow (prot)	0	1828	1583	0	1865	1669	1745	3449	0	1805	1878	0
Flt Permitted		0.746			0.748		0.950			0.950		
Satd. Flow (perm)	0	1417	1583	0	1469	1669	1745	3449	0	1805	1878	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			60		1			1	
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	11	3	31	39	0	60	27	1380	15	60	861	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	31	0	39	60	27	1395	0	60	873	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		8.2	8.2		8.2	23.3	6.6	138.3		9.1	143.0	
Actuated g/C Ratio		0.05	0.05		0.05	0.13	0.04	0.77		0.05	0.79	
v/c Ratio		0.22	0.19		0.58	0.22	0.42	0.53		0.66	0.59	
Control Delay		89.6	2.7		116.5	15.8	103.9	11.1		114.9	12.5	

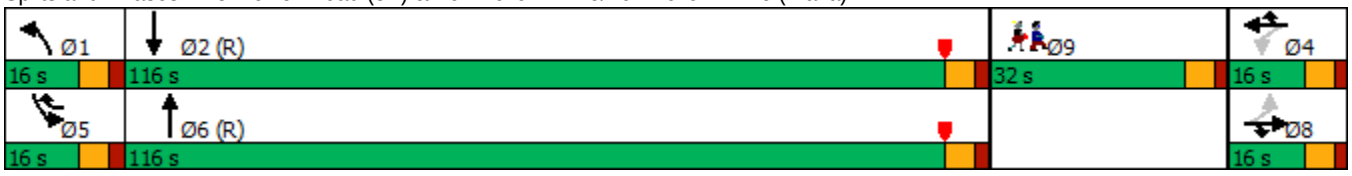
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	2.0	
Total Delay		89.6	2.7		116.5	15.8	103.9	11.1		114.9	14.5	
LOS		F	A		F	B	F	B		F	B	
Approach Delay		29.8			55.4			12.8			21.0	
Approach LOS		C			E			B			C	
Queue Length 50th (ft)		16	0		46	0	32	262		71	305	
Queue Length 95th (ft)		40	0		81	36	70	623		#134	903	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		79	174		82	264	96	2649		104	1491	
Starvation Cap Reductn		0	0		0	0	0	0		0	445	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.18	0.18		0.48	0.23	0.28	0.53		0.58	0.83	

Intersection Summary

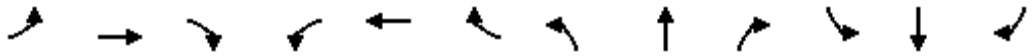
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 66.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1366	15	56	809	11
Future Volume (vph)	9	2	25	31	0	48	27	1366	15	56	809	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828	1583		1865	1669	1745	3450		1805	1878	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1417	1583		1469	1669	1745	3450		1805	1878	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Adj. Flow (vph)	11	2	31	39	0	60	27	1380	15	60	861	12
RTOR Reduction (vph)	0	0	30	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	1	0	39	8	27	1395	0	60	873	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		8.2	8.2		8.2	23.3	5.6	133.5		9.1	137.0	
Effective Green, g (s)		8.2	8.2		8.2	23.3	5.6	133.5		9.1	137.0	
Actuated g/C Ratio		0.05	0.05		0.05	0.13	0.03	0.74		0.05	0.76	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		64	72		66	216	54	2558		91	1429	
v/s Ratio Prot			0.00			0.00	0.02	0.40		c0.03	c0.46	
v/s Ratio Perm		0.01			c0.03							
v/c Ratio		0.22	0.02		0.59	0.04	0.50	0.55		0.66	0.61	
Uniform Delay, d1		82.8	82.1		84.3	68.5	85.8	10.1		83.9	9.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.0		9.1	0.0	2.6	0.8		12.4	2.0	
Delay (s)		83.4	82.1		93.3	68.6	88.5	10.9		96.3	11.6	
Level of Service		F	F		F	E	F	B		F	B	
Approach Delay (s)		82.5			78.3			12.4			17.0	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

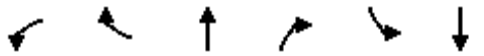
c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	94	157	1280	121	122	798	
Future Volume (vph)	94	157	1280	121	122	798	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.988				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1805	1615	1922	0	1805	1881	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1805	1615	1922	0	1805	1881	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		153	4				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.87	0.87	0.98	0.98	0.89	0.89	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	
Adj. Flow (vph)	108	180	1306	123	137	897	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	108	180	1429	0	137	897	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	15.0	48.4	122.6		27.5	156.0	
Actuated g/C Ratio	0.08	0.25	0.65		0.14	0.82	
v/c Ratio	0.76	0.34	1.15		0.53	0.58	
Control Delay	116.3	14.9	109.9		79.5	10.7	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	0.5		0.0	0.0	
Total Delay	116.3	14.9	110.4		79.5	10.7	
LOS	F	B	F		E	B	
Approach Delay	52.9		110.4			19.8	
Approach LOS	D		F			B	
Queue Length 50th (ft)	135	26	~1988		162	254	
Queue Length 95th (ft)	197	100	#2523		#423	884	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	190	518	1241		260	1544	
Starvation Cap Reductn	0	0	150		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.35	1.31		0.53	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 70.3		Intersection LOS: E	
Intersection Capacity Utilization 101.7%		ICU Level of Service G	
Analysis Period (min) 15			
~ 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.			

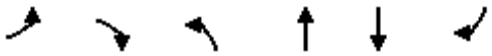
Splits and Phases: 9: Lowell Road (3A) & Pelham Road



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	94	157	1280	121	122	798
Future Volume (vph)	94	157	1280	121	122	798
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1923		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1923		1805	1881
Peak-hour factor, PHF	0.87	0.87	0.98	0.98	0.89	0.89
Adj. Flow (vph)	108	180	1306	123	137	897
RTOR Reduction (vph)	0	114	2	0	0	0
Lane Group Flow (vph)	108	66	1427	0	137	897
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	15.0	48.5	117.7		27.5	151.2
Effective Green, g (s)	15.0	48.5	117.7		27.5	151.2
Actuated g/C Ratio	0.08	0.26	0.62		0.14	0.80
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	142	412	1191		261	1496
v/s Ratio Prot	c0.06	0.04	c0.74		0.08	c0.48
v/s Ratio Perm						
v/c Ratio	0.76	0.16	1.20		0.52	0.60
Uniform Delay, d1	85.7	54.9	36.1		75.2	7.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	19.1	0.1	97.7		0.9	1.8
Delay (s)	104.9	55.0	133.8		76.1	9.4
Level of Service	F	E	F		E	A
Approach Delay (s)	73.7		133.8			18.2
Approach LOS	E		F			B

Intersection Summary			
HCM 2000 Control Delay	84.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	0	1412	844	16
Future Volume (vph)	0	5	0	1412	844	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1881	1881	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1881	1881	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	6	0	1569	938	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	1569	938	18
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

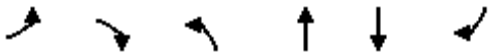
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	0	1412	844	16
Future Vol, veh/h	0	5	0	1412	844	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	6	0	1569	938	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	938	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	323	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	323	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	323	-	-
HCM Lane V/C Ratio	-	0.017	-	-
HCM Control Delay (s)	-	16.3	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

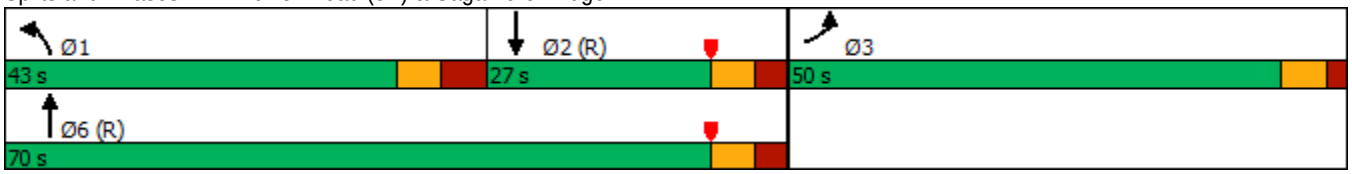


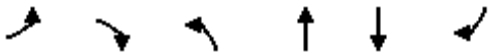
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1652	1593	1442	754	552	1393
Future Volume (vph)	1652	1593	1442	754	552	1393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1242
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.96	0.96	0.94	0.94	0.89	0.89
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Adj. Flow (vph)	1721	1659	1534	802	620	1565
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1721	1659	1534	802	620	1565
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	50.0		43.0	70.0	27.0	
Total Split (%)	41.7%		35.8%	58.3%	22.5%	
Maximum Green (s)	44.0		35.0	63.0	20.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	44.0	120.0	35.0	63.0	20.0	120.0
Actuated g/C Ratio	0.37	1.00	0.29	0.52	0.17	1.00
v/c Ratio	1.27	0.98	1.04	0.42	1.03	0.56
Control Delay	161.1	20.6	63.7	7.7	74.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.1	20.6	63.7	7.7	74.4	2.3
LOS	F	C	E	A	E	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	92.1			44.4	22.7	
Approach LOS	F			D	C	
Queue Length 50th (ft)	~866	0	~451	131	~267	80
Queue Length 95th (ft)	#1003	#216	#549	m166	m#365	61
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1355	1689	1470	1895	601	2814
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	1.27	0.98	1.04	0.42	1.03	0.56

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 58.8		Intersection LOS: E	
Intersection Capacity Utilization 106.5%		ICU Level of Service G	
Analysis Period (min) 15			
~ 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: 4: Lowell Road (3A) & Sagamore Bridge





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1652	1593	1442	754	552	1393
Future Volume (vph)	1652	1593	1442	754	552	1393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3698	1689	5040	3610	3610	2814
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3698	1689	5040	3610	3610	2814
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.89	0.89
Adj. Flow (vph)	1721	1659	1534	802	620	1565
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1721	1659	1534	802	620	1565
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	44.0	120.0	35.0	63.0	20.0	120.0
Effective Green, g (s)	44.0	120.0	35.0	63.0	20.0	120.0
Actuated g/C Ratio	0.37	1.00	0.29	0.52	0.17	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1355	1689	1470	1895	601	2814
v/s Ratio Prot	c0.47		0.30	0.22	0.17	
v/s Ratio Perm		c0.98				0.56
v/c Ratio	1.27	0.98	1.04	0.42	1.03	0.56
Uniform Delay, d1	38.0	0.0	42.5	17.4	50.0	0.0
Progression Factor	1.00	1.00	0.76	0.41	0.79	1.00
Incremental Delay, d2	127.5	18.1	31.2	0.4	34.4	0.4
Delay (s)	165.5	18.1	63.3	7.6	74.1	0.4
Level of Service	F	B	E	A	E	A
Approach Delay (s)	93.1			44.2	21.3	
Approach LOS	F			D	C	

Intersection Summary			
HCM 2000 Control Delay	58.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

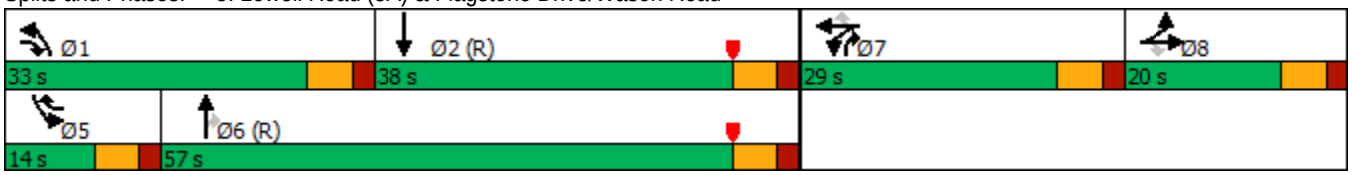
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	98	475	479	19	31	160	1178	1093	80	1024	5
Future Volume (vph)	54	98	475	479	19	31	160	1178	1093	80	1024	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.983		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1868	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Flt Permitted		0.983		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1868	1599	1658	1668	1546	1787	3574	2842	1805	5131	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			136			424		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Adj. Flow (vph)	68	123	594	532	21	34	170	1253	1163	91	1164	6
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	191	594	277	276	34	170	1253	1163	91	1170	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	20.0	20.0	33.0	29.0	29.0	14.0	33.0	57.0	29.0	14.0	38.0	
Total Split (%)	16.7%	16.7%	27.5%	24.2%	24.2%	11.7%	27.5%	47.5%	24.2%	11.7%	31.7%	
Maximum Green (s)	14.0	14.0	27.0	23.0	23.0	8.0	27.0	51.0	23.0	8.0	32.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		13.8	45.7	23.2	23.2	31.0	25.9	51.2	80.4	7.9	33.2	
Actuated g/C Ratio		0.12	0.38	0.19	0.19	0.26	0.22	0.43	0.67	0.07	0.28	
v/c Ratio		0.90	0.90	0.87	0.86	0.07	0.44	0.82	0.57	0.77	0.83	
Control Delay		92.1	48.3	73.5	72.3	0.3	58.6	19.2	0.6	93.6	46.8	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		92.1	48.3	73.5	72.3	0.3	58.6	19.2	0.6	93.6	46.8	
LOS		F	D	E	E	A	E	B	A	F	D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		58.9			68.7			13.4			50.2	
Approach LOS		E			E			B			D	
Queue Length 50th (ft)		148	374	221	220	0	122	203	5	71	315	
Queue Length 95th (ft)		#232	441	#382	#378	0	m126	m161	m1	#155	363	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		217	673	319	321	502	402	1525	2044	120	1418	
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		0.88	0.88	0.87	0.86	0.07	0.42	0.82	0.57	0.76	0.83	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 74 (62%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 35.4		Intersection LOS: D	
Intersection Capacity Utilization 78.1%		ICU Level of Service D	
Analysis Period (min) 15			
# 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	98	475	479	19	31	160	1178	1093	80	1024	5
Future Volume (vph)	54	98	475	479	19	31	160	1178	1093	80	1024	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1867	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Flt Permitted		0.98	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1867	1599	1658	1668	1546	1787	3574	2842	1805	5132	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	68	122	594	532	21	34	170	1253	1163	91	1164	6
RTOR Reduction (vph)	0	0	55	0	0	25	0	0	161	0	1	0
Lane Group Flow (vph)	0	191	539	277	276	9	170	1253	1002	91	1169	0
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	1%	0%	0%	1%	0%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		13.8	39.7	23.2	23.2	31.1	25.9	51.1	74.3	7.9	33.1	
Effective Green, g (s)		13.8	39.7	23.2	23.2	31.1	25.9	51.1	74.3	7.9	33.1	
Actuated g/C Ratio		0.12	0.33	0.19	0.19	0.26	0.22	0.43	0.62	0.07	0.28	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		214	608	320	322	400	385	1521	1901	118	1415	
v/s Ratio Prot		0.10	c0.19	c0.17	0.17	0.00	0.10	c0.35	0.10	0.05	0.23	
v/s Ratio Perm			0.15			0.00			0.25			
v/c Ratio		0.89	0.89	0.87	0.86	0.02	0.44	0.82	0.53	0.77	0.83	
Uniform Delay, d1		52.4	38.0	46.9	46.8	33.1	40.8	30.5	12.9	55.2	40.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.41	0.57	0.05	1.00	1.00	
Incremental Delay, d2		33.8	14.5	20.7	19.3	0.0	0.2	1.5	0.1	25.3	5.6	
Delay (s)		86.2	52.5	67.6	66.1	33.1	57.6	19.0	0.7	80.4	46.4	
Level of Service		F	D	E	E	C	E	B	A	F	D	
Approach Delay (s)		60.7			64.9			13.3			48.9	
Approach LOS		E			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

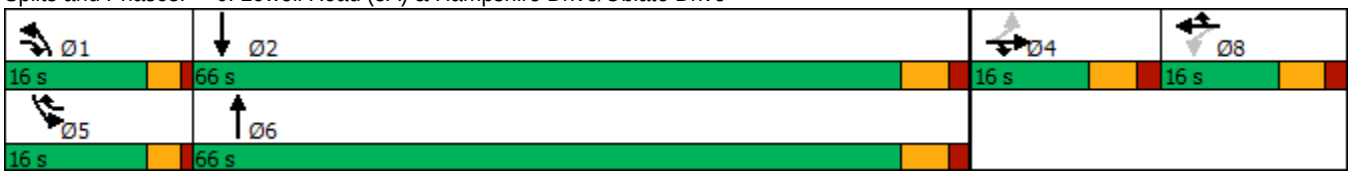
c Critical Lane Group

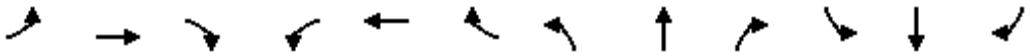
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	2	116	11	1	5	19	1242	14	6	995	8
Future Volume (vph)	28	2	116	11	1	5	19	1242	14	6	995	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.998			0.999	
Flt Protected		0.956			0.955		0.950			0.950		
Satd. Flow (prot)	0	1816	1583	0	1875	1669	1736	3568	0	1745	3571	0
Flt Permitted		0.422					0.950			0.950		
Satd. Flow (perm)	0	802	1583	0	1963	1669	1736	3568	0	1745	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			86		1			1	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Adj. Flow (vph)	35	3	145	14	1	6	20	1307	15	7	1144	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	145	0	15	6	20	1322	0	7	1153	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		9.1	17.5		6.8	9.7	5.8	44.5		5.2	37.2	
Actuated g/C Ratio		0.12	0.24		0.09	0.13	0.08	0.60		0.07	0.51	
v/c Ratio		0.38	0.30		0.08	0.02	0.15	0.61		0.06	0.64	
Control Delay		49.8	6.3		40.8	0.2	42.9	12.7		43.3	15.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		49.8	6.3		40.8	0.2	42.9	12.7		43.3	15.6	
LOS		D	A		D	A	D	B		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		15.3			29.2			13.2			15.8	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		12	0		5	0	7	120		2	154	
Queue Length 95th (ft)		#56	29		27	0	38	386		19	310	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		117	566		288	382	305	3009		307	3012	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.32	0.26		0.05	0.02	0.07	0.44		0.02	0.38	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 73.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 56.4%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	2	116	11	1	5	19	1242	14	6	995	8
Future Volume (vph)	28	2	116	11	1	5	19	1242	14	6	995	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1816	1583		1876	1669	1736	3569		1745	3570	
Flt Permitted		0.42	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		802	1583		1963	1669	1736	3569		1745	3570	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	35	2	145	14	1	6	20	1307	15	7	1144	9
RTOR Reduction (vph)	0	0	118	0	0	5	0	0	0	0	0	0
Lane Group Flow (vph)	0	38	27	0	15	1	20	1322	0	7	1153	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		9.1	14.9		2.3	10.0	5.8	44.5		1.7	40.4	
Effective Green, g (s)		9.1	14.9		2.3	10.0	5.8	44.5		1.7	40.4	
Actuated g/C Ratio		0.11	0.19		0.03	0.13	0.07	0.56		0.02	0.51	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		91	296		56	209	126	1995		37	1811	
v/s Ratio Prot			0.02			0.00	c0.01	c0.37		0.00	0.32	
v/s Ratio Perm		c0.05			c0.01							
v/c Ratio		0.42	0.09		0.27	0.00	0.16	0.66		0.19	0.64	
Uniform Delay, d1		32.8	26.8		37.8	30.4	34.6	12.3		38.3	14.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1	0.1		2.6	0.0	0.2	0.8		0.9	0.7	
Delay (s)		35.9	26.9		40.4	30.4	34.8	13.1		39.2	15.0	
Level of Service		D	C		D	C	C	B		D	B	
Approach Delay (s)		28.8			37.6			13.5			15.1	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

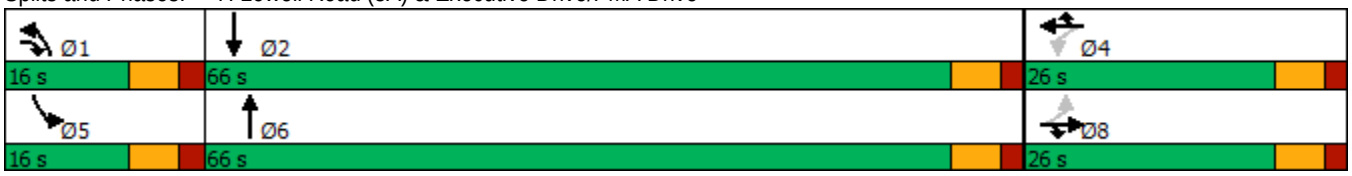
c Critical Lane Group

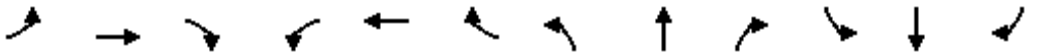
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	3	92	23	2	22	67	1131	7	16	820	44
Future Volume (vph)	265	3	92	23	2	22	67	1131	7	16	820	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.999			0.992	
Flt Protected		0.953			0.957		0.950			0.950		
Satd. Flow (prot)	0	1733	1708	0	1818	1620	1631	3571	0	1646	3540	0
Flt Permitted		0.705			0.568		0.950			0.950		
Satd. Flow (perm)	0	1282	1708	0	1079	1620	1631	3571	0	1646	3540	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			91		1			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	4%	0%	0%	3%	7%	1%	0%	6%	1%	4%
Adj. Flow (vph)	331	4	115	29	3	28	69	1166	7	17	891	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	335	115	0	32	28	69	1173	0	17	939	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	16.0	66.0		16.0	66.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	14.8%	61.1%		14.8%	61.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	10.0	60.0		10.0	60.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		20.4	33.9		20.4	20.4	7.4	39.9		5.5	28.5	
Actuated g/C Ratio		0.27	0.45		0.27	0.27	0.10	0.53		0.07	0.38	
v/c Ratio		0.96	0.14		0.11	0.06	0.43	0.61		0.14	0.69	
Control Delay		71.0	4.1		26.3	0.2	43.0	14.0		39.6	21.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		71.0	4.1		26.3	0.2	43.0	14.0		39.6	21.8	
LOS		E	A		C	A	D	B		D	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		53.9			14.2			15.6			22.1	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		147	0		11	0	30	165		7	182	
Queue Length 95th (ft)		#349	24		36	0	82	318		31	251	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		350	898		294	509	222	2927		224	2903	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.96	0.13		0.11	0.06	0.31	0.40		0.08	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 74.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 24.2		Intersection LOS: C	
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: Lowell Road (3A) & Executive Drive/PMA Drive

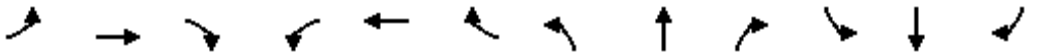




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	3	92	23	2	22	67	1131	7	16	820	44
Future Volume (vph)	265	3	92	23	2	22	67	1131	7	16	820	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733	1708		1818	1620	1631	3571		1646	3541	
Flt Permitted		0.71	1.00		0.57	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1282	1708		1078	1620	1631	3571		1646	3541	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	331	4	115	29	2	28	69	1166	7	17	891	48
RTOR Reduction (vph)	0	0	66	0	0	21	0	0	0	0	5	0
Lane Group Flow (vph)	0	335	49	0	32	7	69	1173	0	17	934	0
Heavy Vehicles (%)	1%	0%	4%	0%	0%	3%	7%	1%	0%	6%	1%	4%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		20.4	33.8		20.4	20.4	7.4	39.9		1.2	33.7	
Effective Green, g (s)		20.4	33.8		20.4	20.4	7.4	39.9		1.2	33.7	
Actuated g/C Ratio		0.26	0.43		0.26	0.26	0.09	0.50		0.02	0.42	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		328	726		276	415	151	1792		24	1501	
v/s Ratio Prot			0.03			0.00	c0.04	c0.33		0.01	0.26	
v/s Ratio Perm		c0.26			0.03							
v/c Ratio		1.02	0.07		0.12	0.02	0.46	0.65		0.71	0.62	
Uniform Delay, d1		29.6	13.5		22.6	22.1	34.1	14.7		39.0	17.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		55.3	0.0		0.1	0.0	0.8	0.9		56.1	0.8	
Delay (s)		84.8	13.5		22.7	22.1	34.9	15.6		95.1	18.7	
Level of Service		F	B		C	C	C	B		F	B	
Approach Delay (s)		66.6			22.4			16.6			20.1	
Approach LOS		E			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1372	15	56	811	11
Future Volume (vph)	9	2	25	31	0	48	27	1372	15	56	811	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.998			0.998	
Flt Protected		0.962			0.950		0.950			0.950		
Satd. Flow (prot)	0	1828	1583	0	1865	1669	1745	3449	0	1805	1878	0
Flt Permitted		0.746			0.748		0.950			0.950		
Satd. Flow (perm)	0	1417	1583	0	1469	1669	1745	3449	0	1805	1878	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			60		1			1	
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	11	3	31	39	0	60	27	1386	15	60	863	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	31	0	39	60	27	1401	0	60	875	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		8.2	8.2		8.2	23.3	6.6	138.3		9.1	143.0	
Actuated g/C Ratio		0.05	0.05		0.05	0.13	0.04	0.77		0.05	0.79	
v/c Ratio		0.22	0.19		0.58	0.22	0.42	0.53		0.66	0.59	
Control Delay		89.6	2.7		116.5	15.8	103.9	11.1		114.9	12.6	

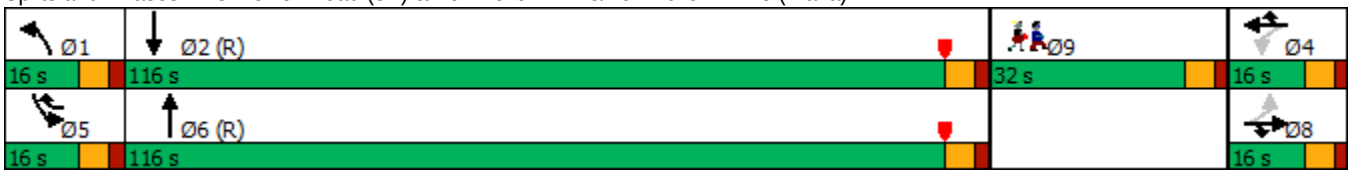
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	2.0	
Total Delay		89.6	2.7		116.5	15.8	103.9	11.1		114.9	14.6	
LOS		F	A		F	B	F	B		F	B	
Approach Delay		29.8			55.4			12.9			21.0	
Approach LOS		C			E			B			C	
Queue Length 50th (ft)		16	0		46	0	32	264		71	306	
Queue Length 95th (ft)		40	0		81	36	70	626		#134	908	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		79	174		82	264	96	2649		104	1491	
Starvation Cap Reductn		0	0		0	0	0	0		0	444	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.18	0.18		0.48	0.23	0.28	0.53		0.58	0.84	

Intersection Summary

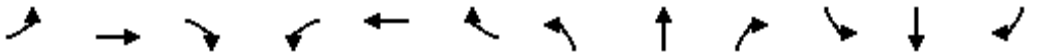
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	25	31	0	48	27	1372	15	56	811	11
Future Volume (vph)	9	2	25	31	0	48	27	1372	15	56	811	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1828	1583		1865	1669	1745	3450		1805	1878	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1417	1583		1469	1669	1745	3450		1805	1878	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.99	0.99	0.99	0.94	0.94	0.94
Adj. Flow (vph)	11	2	31	39	0	60	27	1386	15	60	863	12
RTOR Reduction (vph)	0	0	30	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	1	0	39	8	27	1401	0	60	875	0
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		8.2	8.2		8.2	23.3	5.6	133.5		9.1	137.0	
Effective Green, g (s)		8.2	8.2		8.2	23.3	5.6	133.5		9.1	137.0	
Actuated g/C Ratio		0.05	0.05		0.05	0.13	0.03	0.74		0.05	0.76	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		64	72		66	216	54	2558		91	1429	
v/s Ratio Prot			0.00			0.00	0.02	0.41		c0.03	c0.47	
v/s Ratio Perm		0.01			c0.03							
v/c Ratio		0.22	0.02		0.59	0.04	0.50	0.55		0.66	0.61	
Uniform Delay, d1		82.8	82.1		84.3	68.5	85.8	10.1		83.9	9.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.0		9.1	0.0	2.6	0.8		12.4	2.0	
Delay (s)		83.4	82.1		93.3	68.6	88.5	11.0		96.3	11.6	
Level of Service		F	F		F	E	F	B		F	B	
Approach Delay (s)		82.5			78.3			12.4			17.0	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	94	157	1286	121	122	800	
Future Volume (vph)	94	157	1286	121	122	800	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.988				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1805	1615	1922	0	1805	1881	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1805	1615	1922	0	1805	1881	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		153	4				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.87	0.87	0.98	0.98	0.89	0.89	
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	
Adj. Flow (vph)	108	180	1312	123	137	899	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	108	180	1435	0	137	899	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	15.0	48.4	122.6		27.5	156.0	
Actuated g/C Ratio	0.08	0.25	0.65		0.14	0.82	
v/c Ratio	0.76	0.34	1.16		0.53	0.58	
Control Delay	116.3	14.9	111.8		79.5	10.7	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	0.5		0.0	0.0	
Total Delay	116.3	14.9	112.3		79.5	10.7	
LOS	F	B	F		E	B	
Approach Delay	52.9		112.3			19.8	
Approach LOS	D		F			B	
Queue Length 50th (ft)	135	26	~2004		162	255	
Queue Length 95th (ft)	197	100	#2536		#423	888	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	190	518	1241		260	1544	
Starvation Cap Reductn	0	0	148		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.35	1.31		0.53	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 190			
Actuated Cycle Length: 190			
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 71.4		Intersection LOS: E	
Intersection Capacity Utilization 102.0%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

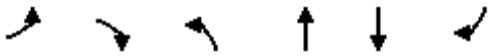
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	94	157	1286	121	122	800
Future Volume (vph)	94	157	1286	121	122	800
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1923		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1923		1805	1881
Peak-hour factor, PHF	0.87	0.87	0.98	0.98	0.89	0.89
Adj. Flow (vph)	108	180	1312	123	137	899
RTOR Reduction (vph)	0	114	2	0	0	0
Lane Group Flow (vph)	108	66	1433	0	137	899
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	15.0	48.5	117.7		27.5	151.2
Effective Green, g (s)	15.0	48.5	117.7		27.5	151.2
Actuated g/C Ratio	0.08	0.26	0.62		0.14	0.80
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	142	412	1191		261	1496
v/s Ratio Prot	c0.06	0.04	c0.75		0.08	c0.48
v/s Ratio Perm						
v/c Ratio	0.76	0.16	1.20		0.52	0.60
Uniform Delay, d1	85.7	54.9	36.1		75.2	7.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	19.1	0.1	99.8		0.9	1.8
Delay (s)	104.9	55.0	136.0		76.1	9.4
Level of Service	F	E	F		E	A
Approach Delay (s)	73.7		136.0			18.2
Approach LOS	E		F			B

Intersection Summary			
HCM 2000 Control Delay	85.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	0	1418	844	18
Future Volume (vph)	0	36	0	1418	844	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1881	1881	1615
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1881	1881	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	40	0	1576	938	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	40	0	1576	938	20
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

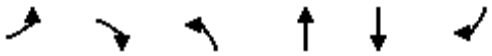
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	0	1418	844	18
Future Vol, veh/h	0	36	0	1418	844	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	40	0	1576	938	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	938	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	323	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	323	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	323	-	-
HCM Lane V/C Ratio	-	0.124	-	-
HCM Control Delay (s)	-	17.7	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

APPENDIX I

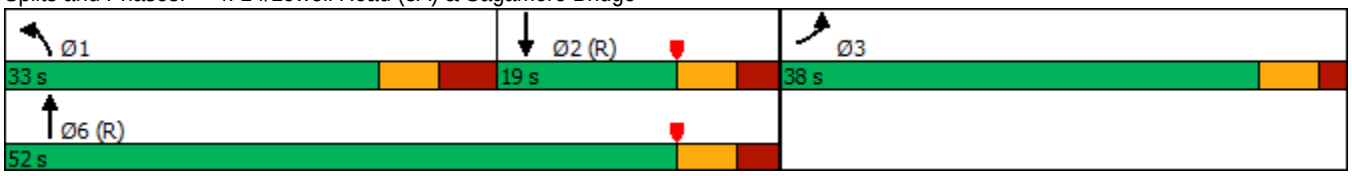


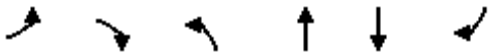
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	980	1095	1038	379	395	1558
Future Volume (vph)	980	1095	1038	379	395	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	12	12	12	12
Storage Length (ft)	0	0	525			200
Storage Lanes	2	1	2			1
Taper Length (ft)	25		100			
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Right Turn on Red		No				Yes
Satd. Flow (RTOR)						1227
Link Speed (mph)	35			30	30	
Link Distance (ft)	929			1189	999	
Travel Time (s)	18.1			27.0	22.7	
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Adj. Flow (vph)	1043	1165	1128	412	429	1693
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1043	1165	1128	412	429	1693
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Detector Phase	3		1	6	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	10.0	
Minimum Split (s)	16.0		15.0	17.0	17.0	
Total Split (s)	38.0		33.0	52.0	19.0	
Total Split (%)	42.2%		36.7%	57.8%	21.1%	
Maximum Green (s)	32.0		25.0	45.0	12.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		4.0	3.0	3.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	6.0		8.0	7.0	7.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	30.6	90.0	25.0	46.4	13.4	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
v/c Ratio	0.84	0.70	0.83	0.23	0.82	0.61
Control Delay	34.3	2.5	25.7	4.6	35.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	2.5	25.7	4.6	35.0	4.2
LOS	C	A	C	A	D	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach Delay	17.6			20.1	10.5	
Approach LOS	B			C	B	
Queue Length 50th (ft)	271	0	221	17	122	93
Queue Length 95th (ft)	349	0	231	12	m134	m102
Internal Link Dist (ft)	849			1109	919	
Turn Bay Length (ft)			525			200
Base Capacity (vph)	1302	1656	1377	1824	525	2760
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	0.80	0.70	0.82	0.23	0.82	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 75.3%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: 14/Lowell Road (3A) & Sagamore Bridge





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	980	1095	1038	379	395	1558
Future Volume (vph)	980	1095	1038	379	395	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	14	14	12	12	12	12
Total Lost time (s)	6.0	4.0	8.0	7.0	7.0	4.0
Lane Util. Factor	0.97	1.00	0.94	0.95	0.95	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3662	1656	4894	3539	3539	2760
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3662	1656	4894	3539	3539	2760
Peak-hour factor, PHF	0.94	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1043	1165	1128	412	429	1693
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1043	1165	1128	412	429	1693
Heavy Vehicles (%)	2%	4%	4%	2%	2%	3%
Turn Type	Prot	Free	Prot	NA	NA	Free
Protected Phases	3		1	6	2	
Permitted Phases		Free				Free
Actuated Green, G (s)	30.6	90.0	25.0	46.4	13.4	90.0
Effective Green, g (s)	30.6	90.0	25.0	46.4	13.4	90.0
Actuated g/C Ratio	0.34	1.00	0.28	0.52	0.15	1.00
Clearance Time (s)	6.0		8.0	7.0	7.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	1245	1656	1359	1824	526	2760
v/s Ratio Prot	0.28		0.23	0.12	0.12	
v/s Ratio Perm		c0.70				0.61
v/c Ratio	0.84	0.70	0.83	0.23	0.82	0.61
Uniform Delay, d1	27.4	0.0	30.5	12.0	37.1	0.0
Progression Factor	1.00	1.00	0.66	0.35	0.73	1.00
Incremental Delay, d2	5.3	2.5	4.1	0.2	5.2	0.4
Delay (s)	32.7	2.5	24.2	4.4	32.4	0.4
Level of Service	C	A	C	A	C	A
Approach Delay (s)	16.8			18.9	6.9	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

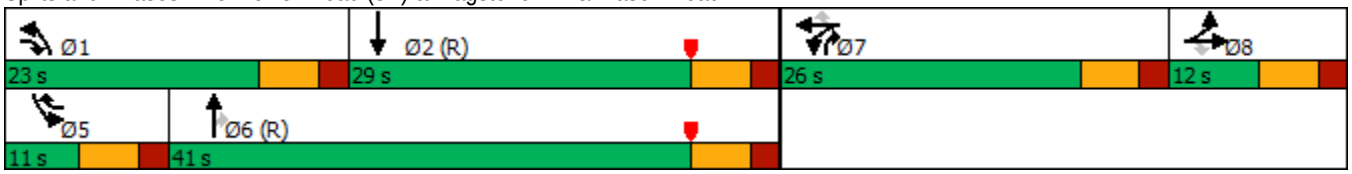
c Critical Lane Group

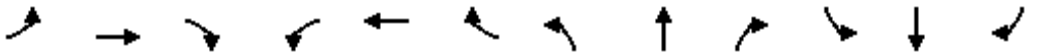
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Future Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		250	200		75	575		275	175		300
Storage Lanes	0		1	1		1	1		2	1		1
Taper Length (ft)	25			50			175			75		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.999	
Flt Protected		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Flt Permitted		0.966		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1835	1583	1641	1657	1501	1787	3539	2787	1752	5079	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			182			198		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			586			999			1515	
Travel Time (s)		18.3			13.3			22.7			34.4	
Peak Hour Factor	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Adj. Flow (vph)	80	35	368	653	44	32	340	875	198	17	1290	11
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	115	368	346	351	32	340	875	198	17	1301	0
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Detector Phase	8	8	1	7	7	5	1	6	7	5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	16.0	11.0	11.0	16.0	
Total Split (s)	12.0	12.0	23.0	26.0	26.0	11.0	23.0	41.0	26.0	11.0	29.0	
Total Split (%)	13.3%	13.3%	25.6%	28.9%	28.9%	12.2%	25.6%	45.6%	28.9%	12.2%	32.2%	
Maximum Green (s)	6.0	6.0	17.0	20.0	20.0	5.0	17.0	35.0	20.0	5.0	23.0	
Yellow Time (s)	4.0	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	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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	C-Min	
Act Effct Green (s)		6.0	29.0	20.0	20.0	25.0	17.0	39.4	65.4	5.0	23.0	
Actuated g/C Ratio		0.07	0.32	0.22	0.22	0.28	0.19	0.44	0.73	0.06	0.26	
v/c Ratio		0.94	0.63	0.95	0.95	0.06	1.01	0.56	0.10	0.18	1.00	
Control Delay		112.3	23.6	72.8	73.2	0.2	94.3	20.0	0.1	44.9	60.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		112.3	23.6	72.8	73.2	0.2	94.3	20.0	0.1	44.9	60.1	
LOS		F	C	E	E	A	F	C	A	D	E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		44.7			69.8			35.1			59.9	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)		66	123	205	208	0	~214	133	0	9	~272	
Queue Length 95th (ft)		#147	183	#382	#386	0	m#339	206	m0	29	#355	
Internal Link Dist (ft)		725			506			919			1435	
Turn Bay Length (ft)			250	200		75	575		275	175		
Base Capacity (vph)		122	583	364	368	548	337	1549	2079	97	1298	
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		0.94	0.63	0.95	0.95	0.06	1.01	0.56	0.10	0.18	1.00	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 48 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 51.0		Intersection LOS: D	
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			
~ 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: 5: Lowell Road (3A) & Flagstone Drive/Wason Road

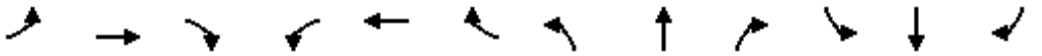




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Future Volume (vph)	65	28	298	614	41	30	323	831	188	15	1122	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	12
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	0.95	0.95	1.00	1.00	0.95	0.88	1.00	0.91	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Flt Permitted		0.97	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1836	1583	1641	1657	1501	1787	3539	2787	1752	5077	
Peak-hour factor, PHF	0.81	0.81	0.81	0.94	0.94	0.94	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	80	35	368	653	44	32	340	875	198	17	1290	11
RTOR Reduction (vph)	0	0	81	0	0	24	0	0	73	0	1	0
Lane Group Flow (vph)	0	115	287	346	351	8	340	875	125	17	1300	0
Heavy Vehicles (%)	0%	0%	2%	1%	0%	4%	1%	2%	2%	3%	2%	6%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	8	8	1	7	7	5	1	6	7	5	2	
Permitted Phases			8			7			6			
Actuated Green, G (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Effective Green, g (s)		6.0	23.0	20.0	20.0	23.0	17.0	37.0	57.0	3.0	23.0	
Actuated g/C Ratio		0.07	0.26	0.22	0.22	0.26	0.19	0.41	0.63	0.03	0.26	
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)		2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	3.0	
Lane Grp Cap (vph)		122	510	364	368	383	337	1454	1950	58	1297	
v/s Ratio Prot		c0.06	0.11	0.21	c0.21	0.00	c0.19	0.25	0.01	0.01	c0.26	
v/s Ratio Perm			0.07			0.00			0.03			
v/c Ratio		0.94	0.56	0.95	0.95	0.02	1.01	0.60	0.06	0.29	1.00	
Uniform Delay, d1		41.8	29.1	34.5	34.5	25.1	36.5	20.7	6.3	42.5	33.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.34	0.94	0.00	1.00	1.00	
Incremental Delay, d2		63.4	1.2	34.4	34.8	0.0	45.2	1.4	0.0	2.0	25.6	
Delay (s)		105.2	30.3	68.9	69.3	25.1	94.2	20.8	0.0	44.5	59.1	
Level of Service		F	C	E	E	C	F	C	A	D	E	
Approach Delay (s)		48.1			67.2			35.6			58.9	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

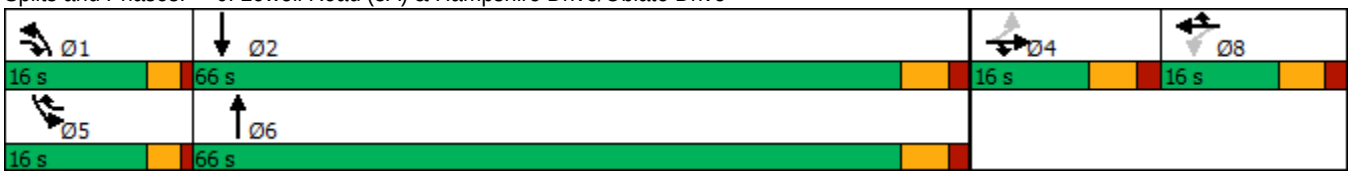


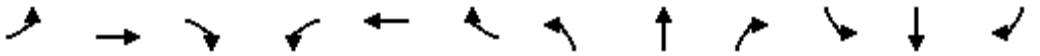
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Future Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	13	13	13	12	12	12	11	12	12
Storage Length (ft)	0		100	0		100	225		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850					0.993	
Flt Protected		0.950			0.976		0.950			0.950		
Satd. Flow (prot)	0	1719	1455	0	1916	1669	1752	3505	0	1745	3480	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1810	1455	0	1963	1669	1752	3505	0	1745	3480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			86					7	
Link Speed (mph)		30			10			30			30	
Link Distance (ft)		495			382			1515			1791	
Travel Time (s)		11.3			26.0			34.4			40.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Adj. Flow (vph)	10	0	14	3	3	5	134	881	2	2	1427	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	14	0	6	5	134	883	0	2	1498	0
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4	4 1	8	8	8 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		2.0	15.0		2.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	21.0		8.0	21.0	
Total Split (s)	16.0	16.0		16.0	16.0		16.0	66.0		16.0	66.0	
Total Split (%)	14.0%	14.0%		14.0%	14.0%		14.0%	57.9%		14.0%	57.9%	
Maximum Green (s)	10.0	10.0		10.0	10.0		12.0	60.0		12.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0		1.0	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		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Act Effct Green (s)		7.4	11.6		6.5	9.1	11.0	68.3		5.1	49.3	
Actuated g/C Ratio		0.09	0.15		0.08	0.11	0.14	0.86		0.06	0.62	
v/c Ratio		0.06	0.05		0.04	0.02	0.55	0.29		0.02	0.69	
Control Delay		44.4	0.4		46.6	0.2	48.1	5.1		48.5	14.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		44.4	0.4		46.6	0.2	48.1	5.1		48.5	14.9	
LOS		D	A		D	A	D	A		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			25.5			10.7			15.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		4	0		2	0	50	0		1	153	
Queue Length 95th (ft)		22	0		16	0	#183	207		8	454	
Internal Link Dist (ft)		415			302			1435			1711	
Turn Bay Length (ft)			100			100	225			225		
Base Capacity (vph)		251	326		272	363	292	3016		290	2772	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.04	0.04		0.02	0.01	0.46	0.29		0.01	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 114			
Actuated Cycle Length: 79.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Lowell Road (3A) & Hampshire Drive/Oblate Drive





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Future Volume (vph)	8	0	11	2	2	4	121	793	2	2	1184	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	13	13	13	12	12	12	11	12	12
Total Lost time (s)		6.0	6.0		6.0	6.0	4.0	6.0		4.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1455		1915	1669	1752	3504		1745	3480	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1455		1963	1669	1752	3504		1745	3480	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	10	0	14	2	2	5	134	881	2	2	1427	71
RTOR Reduction (vph)	0	0	12	0	0	5	0	0	0	0	3	0
Lane Group Flow (vph)	0	10	2	0	6	0	134	883	0	2	1495	0
Heavy Vehicles (%)	5%	0%	11%	0%	0%	0%	3%	3%	0%	0%	3%	3%
Turn Type	Perm	NA	pt+ov	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		4	4 1		8	8 5	1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)		2.6	13.6		1.9	8.6	11.0	63.4		0.7	53.1	
Effective Green, g (s)		2.6	13.6		1.9	8.6	11.0	63.4		0.7	53.1	
Actuated g/C Ratio		0.03	0.15		0.02	0.09	0.12	0.70		0.01	0.59	
Clearance Time (s)		6.0			6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		51	218		41	158	212	2452		13	2039	
v/s Ratio Prot			0.00			0.00	c0.08	0.25		0.00	c0.43	
v/s Ratio Perm		c0.01			c0.00							
v/c Ratio		0.20	0.01		0.15	0.00	0.63	0.36		0.15	0.73	
Uniform Delay, d1		43.0	32.8		43.6	37.1	37.9	5.5		44.7	13.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		1.6	0.0	4.5	0.1		2.0	1.4	
Delay (s)		44.9	32.8		45.2	37.1	42.3	5.5		46.7	15.0	
Level of Service		D	C		D	D	D	A		D	B	
Approach Delay (s)		37.8			41.5			10.4			15.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

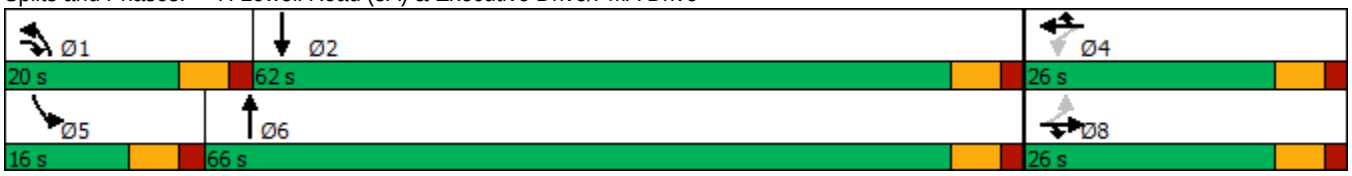
c Critical Lane Group

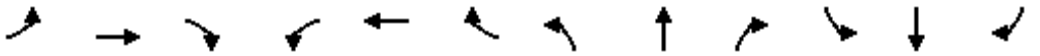
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	2	22	141	30	101	179	455	60	107	1074	203
Future Volume (vph)	55	2	22	141	30	101	179	455	60	107	1074	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	15	12	12	13	11	12	12	11	12	12
Storage Length (ft)	0		225	0		80	350		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			50			50		
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
Frt			0.850			0.850		0.983			0.976	
Flt Protected		0.954			0.961		0.950			0.950		
Satd. Flow (prot)	0	1613	1421	0	1811	1620	1678	3416	0	1728	3454	0
Flt Permitted		0.435			0.715		0.950			0.950		
Satd. Flow (perm)	0	736	1421	0	1347	1620	1678	3416	0	1728	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			101		21			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		492			577			1791			1168	
Travel Time (s)		11.2			13.1			40.7			26.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Adj. Flow (vph)	69	3	28	176	38	126	197	500	66	118	1180	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	72	28	0	214	126	197	566	0	118	1403	0
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8 1	4	4	4	1	6		5	2	
Switch Phase												
Minimum Initial (s)	3.0	3.0		5.0	5.0	5.0	3.0	8.0		3.0	8.0	
Minimum Split (s)	9.0	9.0		11.0	11.0	11.0	9.0	14.0		9.0	14.0	
Total Split (s)	26.0	26.0		26.0	26.0	26.0	20.0	66.0		16.0	62.0	
Total Split (%)	24.1%	24.1%		24.1%	24.1%	24.1%	18.5%	61.1%		14.8%	57.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0	20.0	14.0	60.0		10.0	56.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Act Effct Green (s)		18.2	37.9		18.2	18.2	13.6	52.6		9.3	48.3	
Actuated g/C Ratio		0.18	0.39		0.18	0.18	0.14	0.53		0.09	0.49	
v/c Ratio		0.53	0.05		0.86	0.33	0.85	0.31		0.72	0.82	
Control Delay		54.6	7.6		72.0	14.1	75.3	12.8		71.4	25.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		54.6	7.6		72.0	14.1	75.3	12.8		71.4	25.6	
LOS		D	A		E	B	E	B		E	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		41.4			50.6			28.9			29.2	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		43	0		138	14	130	99		77	387	
Queue Length 95th (ft)		83	14		#227	51	#272	133		#172	481	
Internal Link Dist (ft)		412			497			1711			1088	
Turn Bay Length (ft)			225			80	350			150		
Base Capacity (vph)		151	561		278	414	242	2124		178	2010	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.48	0.05		0.77	0.30	0.81	0.27		0.66	0.70	

Intersection Summary			
Area Type:	Other		
Cycle Length: 108			
Actuated Cycle Length: 98.4			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 32.2		Intersection LOS: C	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: Lowell Road (3A) & Executive Drive/PMA Drive

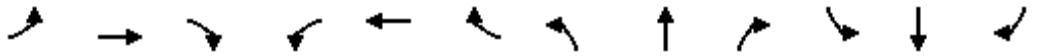




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	2	22	141	30	101	179	455	60	107	1074	203
Future Volume (vph)	55	2	22	141	30	101	179	455	60	107	1074	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	15	12	12	13	11	12	12	11	12	12
Total Lost time (s)		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	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1614	1421		1810	1620	1678	3414		1728	3455	
Flt Permitted		0.44	1.00		0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		736	1421		1347	1620	1678	3414		1728	3455	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	69	2	28	176	38	126	197	500	66	118	1180	223
RTOR Reduction (vph)	0	0	17	0	0	82	0	10	0	0	15	0
Lane Group Flow (vph)	0	72	11	0	214	44	197	556	0	118	1388	0
Heavy Vehicles (%)	9%	0%	25%	1%	0%	3%	4%	4%	3%	1%	2%	2%
Turn Type	Perm	NA	pt+ov	Perm	NA	Prot	Prot	NA		Prot	NA	
Protected Phases		8	8 1		4	4	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		18.2	37.8		18.2	18.2	13.6	52.7		9.3	48.4	
Effective Green, g (s)		18.2	37.8		18.2	18.2	13.6	52.7		9.3	48.4	
Actuated g/C Ratio		0.19	0.38		0.19	0.19	0.14	0.54		0.09	0.49	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		136	546		249	300	232	1832		163	1702	
v/s Ratio Prot			0.01			0.03	c0.12	c0.16		0.07	c0.40	
v/s Ratio Perm		0.10			c0.16							
v/c Ratio		0.53	0.02		0.86	0.15	0.85	0.30		0.72	0.82	
Uniform Delay, d1		36.1	18.7		38.8	33.5	41.3	12.6		43.2	21.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7	0.0		23.5	0.1	23.2	0.1		12.6	3.1	
Delay (s)		37.8	18.7		62.3	33.6	64.5	12.7		55.8	24.2	
Level of Service		D	B		E	C	E	B		E	C	
Approach Delay (s)		32.5			51.6			26.1			26.7	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



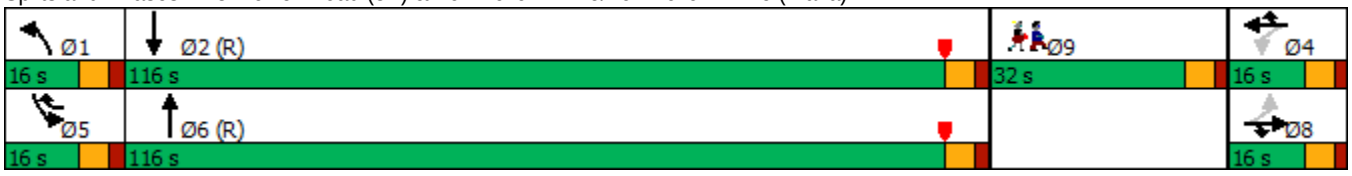
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Future Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	13	11	11	12	12	12	12
Storage Length (ft)	0		50	0		100	210		325	125		0
Storage Lanes	0		1	0		1	1		1	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850						
Flt Protected		0.950			0.950		0.950			0.950		
Satd. Flow (prot)	0	1719	1583	0	1865	1669	1745	3356	0	1805	1863	0
Flt Permitted		0.752			0.748		0.950			0.950		
Satd. Flow (perm)	0	1361	1583	0	1469	1669	1745	3356	0	1805	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			55						
Link Speed (mph)		10			30			30			30	
Link Distance (ft)		598			262			1405			549	
Travel Time (s)		40.8			6.0			31.9			12.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Adj. Flow (vph)	14	0	60	8	0	13	4	644	1	17	1397	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	60	0	8	13	4	645	0	17	1400	0
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8	8	4	4	4 5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	16.0	16.0	16.0	16.0	16.0		16.0	116.0		16.0	116.0	
Total Split (%)	8.9%	8.9%	8.9%	8.9%	8.9%		8.9%	64.4%		8.9%	64.4%	
Maximum Green (s)	10.0	10.0	10.0	10.0	10.0		10.0	110.0		10.0	110.0	
Yellow Time (s)	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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.5	1.5	1.5	1.5	1.5		1.0	1.5		1.5	1.5	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		6.3	6.3		6.3	18.3	5.0	147.7		6.0	153.1	
Actuated g/C Ratio		0.04	0.04		0.04	0.10	0.03	0.82		0.03	0.85	
v/c Ratio		0.30	0.42		0.16	0.06	0.08	0.23		0.28	0.88	
Control Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	19.2	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	32.0
Total Split (s)	32.0
Total Split (%)	18%
Maximum Green (s)	26.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.5
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	17.5	
Total Delay		100.2	12.4		90.2	0.5	89.0	5.8		95.9	36.7	
LOS		F	B		F	A	F	A		F	D	
Approach Delay		29.0			34.7			6.3			37.4	
Approach LOS		C			C			A			D	
Queue Length 50th (ft)		17	0		9	0	5	68		20	464	
Queue Length 95th (ft)		40	3		27	0	20	213		50	#2213	
Internal Link Dist (ft)		518			182			1325			469	
Turn Bay Length (ft)			50			100	210			125		
Base Capacity (vph)		75	173		81	234	96	2753		100	1585	
Starvation Cap Reductn		0	0		0	0	0	0		0	218	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.19	0.35		0.10	0.06	0.04	0.23		0.17	1.02	

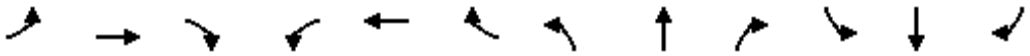
Intersection Summary			
Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow, Master Intersection			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 27.7		Intersection LOS: C	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 8: Lowell Road (3A) & Fox Hollow Drive/Fox Hollow Drive (Plaza)



Lane Group	Ø9
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Future Volume (vph)	11	0	48	6	0	10	4	586	1	16	1327	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	14	13	13	11	11	12	12	12	12
Total Lost time (s)		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	0.95		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	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	
Satd. Flow (prot)		1719	1583		1865	1669	1745	3355		1805	1862	
Flt Permitted		0.75	1.00		0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1362	1583		1469	1669	1745	3355		1805	1862	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	14	0	60	8	0	12	4	644	1	17	1397	3
RTOR Reduction (vph)	0	0	58	0	0	12	0	0	0	0	0	0
Lane Group Flow (vph)	0	14	2	0	8	1	4	645	0	17	1400	0
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Turn Type	Perm	NA	Prot	Perm	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases		8	8		4	4 5	1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Effective Green, g (s)		6.3	6.3		6.3	16.3	1.0	140.5		4.0	143.5	
Actuated g/C Ratio		0.03	0.03		0.03	0.09	0.01	0.78		0.02	0.80	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		1.5	1.5		1.5		1.0	1.5		1.5	1.5	
Lane Grp Cap (vph)		47	55		51	151	9	2618		40	1484	
v/s Ratio Prot			0.00			0.00	0.00	0.19		c0.01	c0.75	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.30	0.04		0.16	0.01	0.44	0.25		0.42	0.94	
Uniform Delay, d1		84.7	83.9		84.3	74.5	89.2	5.4		86.9	14.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3	0.1		0.5	0.0	12.2	0.2		2.6	13.3	
Delay (s)		86.0	84.0		84.8	74.5	101.4	5.6		89.5	28.2	
Level of Service		F	F		F	E	F	A		F	C	
Approach Delay (s)		84.4			78.4			6.2			28.9	
Approach LOS		F			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	232	73	520	84	64	1118	
Future Volume (vph)	232	73	520	84	64	1118	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	13	13	12	12	
Storage Length (ft)	0	75		0	150		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850	0.981				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1787	1524	1839	0	1719	1863	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1524	1839	0	1719	1863	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		29	7				
Link Speed (mph)	20		30			30	
Link Distance (ft)	512		549			1309	
Travel Time (s)	17.5		12.5			29.8	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.96	0.96	
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%	
Adj. Flow (vph)	264	83	565	91	67	1165	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	264	83	656	0	67	1165	
Turn Type	Prot	pt+ov	NA		Prot	NA	
Protected Phases	4	4 5	6		5	2	9
Permitted Phases							
Detector Phase	4	4 5	6		5	2	
Switch Phase							
Minimum Initial (s)	5.0		10.0		3.0	10.0	5.0
Minimum Split (s)	11.0		16.0		9.0	16.0	35.0
Total Split (s)	26.0		116.0		13.0	129.0	35.0
Total Split (%)	13.7%		61.1%		6.8%	67.9%	18%
Maximum Green (s)	20.0		110.0		7.0	123.0	29.0
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0	
Lead/Lag			Lag		Lead		
Lead-Lag Optimize?			Yes		Yes		
Vehicle Extension (s)	1.5		1.5		1.5	1.5	3.0
Recall Mode	None		C-Min		None	C-Min	None
Walk Time (s)							5.0
Flash Dont Walk (s)							24.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	40.3	57.6	113.4		11.2	130.7	
Actuated g/C Ratio	0.21	0.30	0.60		0.06	0.69	
v/c Ratio	0.70	0.17	0.60		0.66	0.91	
Control Delay	77.6	36.4	26.5		111.9	36.1	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Delay	0.0	0.0	2.9		0.0	0.0	
Total Delay	77.6	36.4	29.3		111.9	36.1	
LOS	E	D	C		F	D	
Approach Delay	67.7		29.3			40.2	
Approach LOS	E		C			D	
Queue Length 50th (ft)	308	48	470		82	1018	
Queue Length 95th (ft)	#620	114	652		#210	#1718	
Internal Link Dist (ft)	432		469			1229	
Turn Bay Length (ft)		75			150		
Base Capacity (vph)	379	482	1100		101	1281	
Starvation Cap Reductn	0	0	323		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.17	0.84		0.66	0.91	

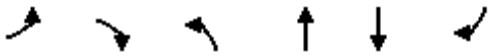
Intersection Summary	
Area Type:	Other
Cycle Length: 190	
Actuated Cycle Length: 190	
Offset: 30 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 41.3	Intersection LOS: D
Intersection Capacity Utilization 81.7%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 9: Lowell Road (3A) & Pelham Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	232	73	520	84	64	1118
Future Volume (vph)	232	73	520	84	64	1118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	13	12	12
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1524	1840		1719	1863
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1524	1840		1719	1863
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.96	0.96
Adj. Flow (vph)	264	83	565	91	67	1165
RTOR Reduction (vph)	0	20	3	0	0	0
Lane Group Flow (vph)	264	63	653	0	67	1165
Heavy Vehicles (%)	1%	6%	5%	3%	5%	2%
Turn Type	Prot	pt+ov	NA		Prot	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases						
Actuated Green, G (s)	40.3	57.5	108.7		11.2	125.9
Effective Green, g (s)	40.3	57.5	108.7		11.2	125.9
Actuated g/C Ratio	0.21	0.30	0.57		0.06	0.66
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	1.5		1.5		1.5	1.5
Lane Grp Cap (vph)	379	461	1052		101	1234
v/s Ratio Prot	c0.15	0.04	0.35		0.04	c0.63
v/s Ratio Perm						
v/c Ratio	0.70	0.14	0.62		0.66	0.94
Uniform Delay, d1	69.2	48.2	27.0		87.6	28.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.5	0.0	2.8		12.0	15.3
Delay (s)	73.7	48.2	29.7		99.5	44.2
Level of Service	E	D	C		F	D
Approach Delay (s)	67.6		29.7			47.2
Approach LOS	E		C			D

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	23	0	612	1361	10
Future Volume (vph)	0	23	0	612	1361	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	200			200
Storage Lanes	0	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				0.850
Flt Protected						
Satd. Flow (prot)	0	1644	0	1827	1863	1468
Flt Permitted						
Satd. Flow (perm)	0	1644	0	1827	1863	1468
Link Speed (mph)	30			30	30	
Link Distance (ft)	704			770	1145	
Travel Time (s)	16.0			17.5	26.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	4%	2%	10%
Adj. Flow (vph)	0	26	0	680	1512	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	26	0	680	1512	11
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	612	1361	10
Future Vol, veh/h	0	23	0	612	1361	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	2	10
Mvmt Flow	0	26	0	680	1512	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1512	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	149	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	149	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.1	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	149	-	-
HCM Lane V/C Ratio	-	0.172	-	-
HCM Control Delay (s)	-	34.1	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-