Surface Rating Mileage Summary For A Range of Years

Rating Year: 2018

Surface Subtype	PASER Rating 10	9	8	7	6	5	4	3	2	1	Total Centerline Mileage	APR*
Asphalt-Standard	3.595	3.916	2.918	4.004	10.628	12.270	23.582	7.420	1.351	0.000	**69.684**	5.266
Concrete - Curb & Gutter	0.000	0.592	0.697	2.360	1.962	3.657	3.361	2.677	0.867	0.059	**16.232**	4.975
asphalt Curb & Gutter	0.000	0.014	0.054	0.227	0.119	0.698	0.241	0.000	0.201	0.000	**1.554**	4.966
Gravel-Standard	0.000	0.000	0.803	0.000	1.459	0.000	0.439	0.000	0.040	0.000	**2.741**	6.207
Asphalt - CG	0.000	0.000	0.000	0.000	0.136	0.058	0.429	0.071	0.000	0.000	**0.694**	4.373
Concrete - Local C&G	0.000	0.000	0.042	0.304	0.000	0.152	0.185	0.221	0.000	0.000	**0.904**	5.118
Asphalt w/conc Curb & Gutter	0.598	1.164	3.392	2.301	11.594	9.366	11.046	3.756	1.045	0.000	**44.262**	5.278
Sealcoat-Standard	0.000	0.497	3.153	1.088	0.616	0.879	0.545	0.216	0.290	0.000	**7.284**	6.701
Concrete-Standard	0.810	1.173	4.420	8.409	5.394	12.142	9.592	2.395	0.000	0.000	**44.335**	5.673
Asphalt Open Ditch	0.000	0.472	0.366	0.277	0.023	0.252	0.000	0.339	0.127	0.000	**1.856**	6.349
Total Centerline Mileage	**5.003**	**7.828**	**15.845**	**18.970**	**31.931**	**39.474**	**49.420**	**17.095**	**3.921**	**0.059**	**189.546**	**5.412**

*APR=Average Paser Rating calculated by weighting the mileage with the paser value

Surface Rating Mileage Summary For A Range of Years

Rating Year: 2020

Surface Subtype	PASER Rating 10	9	8	7	6	5	4	3	2	1	Total Centerline Mileage	APR*
Asphalt-Standard	0.377	5.581	4.844	6.527	12.846	12.695	21.303	6.424	0.964	0.000	**71.561**	5.386
Concrete - Curb & Gutter	0.339	2.581	0.646	3.515	1.895	3.687	2.425	1.246	0.030	0.000	**16.364**	6.092
asphalt Curb & Gutter	0.000	0.370	0.054	0.227	0.000	0.289	0.769	0.000	0.000	0.000	**1.709**	5.776
Asphalt - CG	0.000	0.071	0.000	0.000	0.136	0.058	0.429	0.000	0.000	0.000	**0.694**	4.987
Concrete - Local C&G	0.015	0.000	0.163	0.152	0.183	0.000	0.185	0.206	0.000	0.000	**0.904**	5.502
Asphalt w/conc Curb & Gutter	1.998	2.012	2.407	5.234	11.831	9.330	8.742	2.307	0.942	0.000	**44.803**	5.700
Sealcoat-Standard	0.000	0.686	3.264	2.318	0.300	0.320	0.293	0.025	0.000	0.078	**7.284**	7.309
Concrete-Standard	2.707	1.840	4.784	9.182	7.333	11.217	5.646	1.254	0.337	0.000	**44.300**	6.169
Asphalt Open Ditch	0.000	0.583	0.366	0.300	0.252	0.000	0.000	0.228	0.127	0.000	**1.856**	6.856
Total Centerline Mileage	**5.436**	**13.724**	**16.528**	**27.455**	**34.776**	**37.596**	**39.792**	**11.690**	**2.400**	**0.078**	**189.475**	**5.795**

*APR=Average Paser Rating calculated by weighting the mileage with the paser value

MEMORANDUM

TO: PETE AUGER, CITY MANAGER

FROM: JEFFREY HERCZEG, DIRECTOR OF PUBLIC WORKS

SUBJECT: 10 MILE STUDY AND RCOC PROJECT FUNDING

DATE: SEPTEMBER 26, 2019

Consistent with City Council's Long Term Goals, staff initiated in the fall of 2018 a 10 Mile Road Corridor Study for the current and future operations of 10 Mile Road within the City's limits. The study by OHM Advisors, was completed in June 2019, and the results are included herein for review and reference. Since 10 Mile Road falls in the jurisdiction of the Road Commission for Oakland County (RCOC), the City submitted the findings to RCOC in July 2019 to ensure the resulting study is acceptable for both agencies and properly addresses the future of 10 Mile Road. City staff and RCOC leadership met in August to approve the final version of the study.

Primary findings of the Corridor Study include:

- Under existing conditions, most intersections within the study area operate with moderate delay, and the delay is expected to increase with future growth and planned developments.
- While adjustments in signal timing and phasing will relieve some of the pressure, more substantial improvements will likely be necessary at locations throughout the corridor.
- Crash data indicates strong patterns related to lane merges and the lack of a center left turn lane.
- The addition of a center left turn lane throughout the corridor would reduce these crash patterns, improve access and reduce traffic flow obstructions in the corridor.
- In the future, the more congested intersections are expected to see long delays, particularly in the PM Peak period.
- At each location, additional widening and signal operational changes can offer some relief. In many cases this relief will be modest with delays remaining just barely acceptable.
- Alternatively, construction of a roundabout intersection at some or all of these intersections offers greater reduction in delay and commensurate improvement in safety.

During the study time period, RCOC indicated their plans to do a preservation overlay on the entire 10 Mile corridor through Novi, and in summer of 2019 that work was completed from Meadowbrook Road to Napier Road. The Meadowbrook Road to Haggerty Road section was delayed and left in its existing condition. Preliminary findings from the Corridor Study indicated this section of 10 Mile Road (Meadowbrook to Haggerty) included the highest vehicle crash totals and generated the most public concern for traffic operation.

Since Novi staff had already engaged OHM Advisors with the study prior to the commencement of the preservation project, RCOC agreed to defer this section of their scheduled preservation project until OHM brought back improvement recommendations.

In coordination with Novi and RCOC, OHM Advisors further analyzed the one-mile segment of 10 Mile Road between Meadowbrook Road and Haggerty Road. The goal of the additional analysis was to collaborate with RCOC to explore the anticipated impacts and costs of adding a continuous center left turn lane along 10 Mile Road, from Meadowbrook Road to Haggerty Road. During the investigation OHM discovered two failing culverts (Bishop Creek and Ingersol Creek) and determined the project was/should be more substantial than originally anticipated.

The included Technical Memorandum and proposed 10 Mile Road improvement concept intends to maximize the existing roadway infrastructure by combining rehabilitation and isolated reconstruction efforts. This section of 10 Mile Road varies between 2 and 5 lanes, with the 5 lane sections occurring at the Meadowbrook and Haggerty Road signalized intersections. The area generally consists of a variety of open and enclosed drainage systems that outlet to Bishop Creek or the Francis Drain/Ingersol Creek. These, as well as other features, are depicted in the Conceptual Illustrative Rendering (Exhibit A). A conceptual opinion of probable design, right-of-way, and construction cost has also been attached as Exhibit B.

In the meeting last month when the Corridor Study was submitted to RCOC, staff discussed OHM Advisor's findings, recommendations, and options to facilitate this much needed improvement. An agreement was reached for RCOC to reserve Federal Aid dollars in 2024 for this project. In order to expedite the construction of the project, Novi can choose to front the costs (estimated at ~$5.5M) and advance construct as early as 2022. This would allow time for the design to be completed and for the project to move through the Federal Aid process. The City would be reimbursed by RCOC in 2024, when their committed Federal Aid funds become available.

The project is estimated ~$5.5M including a local match requirement of ~$1M to maximize the federal funds. Novi can enter into an agreement (similar to the current Novi Road/12 Mile Intersection) by sharing in 50% of the federal match cost (Novi share $500K) and 50% of the design cost (Novi share $250K) with RCOC. Additionally, Tri-Party Funding dollars could be utilized on this project, lowering the overall costs for the City. Therefore, after the 2024 payback, the City's total investment in the project would be $750K or less. Staff recommends entering into this agreement with RCOC to complete the proposed center left turn lane, road resurfacing, drainage, and traffic signal improvements in collaboration with RCOC.

Non-Motorized Improvements

The Non-Motorized Master Plan and the 2019-20 Annual Non-Motorized Prioritization calls for completion of pathway (segment 80) on the north side of 10 Mile Road, between Meadowbrook Road and Haggerty Road. This study also examines a concept layout for a future pathway (segment 81) on the south side of 10 Mile Road, but does not include design or construction costs for the pathway as a part of the project. Additional proposed ROW or

easements needed for pathway construction have not been thoroughly analyzed. These costs are not included in Exhibit B. The non-motorized portion of the project would not be reimbursable through the Federal Aid but could be accomplished as part of the project at the City's expense.

Please let me know if you have any questions regarding this memo.

Cc: Victor Cardenas, Assistant City Manager
Ben Croy, City Engineer
Megan Mikus, Deputy Director of Public Works

CITY OF NOVI

10 MILE CORRIDOR STUDY

JUNE 2019

OHM Advancing Communities®

EXECUTIVE SUMMARY

OHM developed this study on behalf of the City of Novi and in conjunction with the Road Commission for Oakland County (RCOC) to assess the present and anticipated operational and safety performance of 10 Mile within the city limits. Under existing conditions, the majority of the intersections within the study area operate with moderate delay. While the overall average intersection delay is often within the acceptable range at these locations, many individual approaches operate with more substantial delay during the peak periods. With background growth and planned future developments expected to increase traffic volumes, it will be necessary to monitor any further degradation of operations at these intersections. While adjustments in signal timing and phasing will relieve the some of the pressure, more substantial improvements will likely be necessary at locations throughout the corridor.

The variable number of lanes throughout the corridor has led to operational, safety and access concerns. Two segments east of Novi Road were identified as high crash locations, with crash data indicating strong patterns related to lane merges and the lack of a center left turn lane. The addition of a center left turn lane throughout the corridor would reduce these crash patterns, improve access and reduce traffic flow obstructions in the corridor.

In the future, the more congested intersections expected to see long delays with approach and overall intersection LOS expected to operate outside with unacceptable amounts of delay, particularly in the PM Peak period. Many of these intersections have already undergone substantial road widening and signal timing adjustments to attempt to minimize delays. At each location, additional widening and signal operational changes can offer some relief. In many cases this relief will be modest with delays remaining just barely acceptable. Alternatively, construction of a roundabout intersection at some or all of these intersections offers greater reduction in delay and commensurate improvement in safety. This type of improvement is also more substantial than the addition of a turn lane and implementation would require coordinating and planning.

Analyzed intersection alternatives are summarized below.

Table: Intersection Improvement Analysis 2040 PM Peak Summary

	Analyzed Improvement	Change in Delay (Sec.)
10 Mile Rd. & Wixom Rd.	Signal - Add SB right turn lane, adjust signal phasing	-16.0
	Roundabout - Single lane with second EB lane	-42.1
10 Mile Rd. & Beck Rd.	Signal – Widen Beck to 5 lanes	-36.1
	Roundabout – Two lane	-75.8
10 Mile Rd. & Taft Rd.	Signal - Add SB right turn lane, adjust signal phasing	-3.5
	Roundabout - Two lane with one lane NB and SB approaches	-34.1
10 Mile Rd. & Novi Rd.	Signal – Add dual left turns EB/WB, add right turn lane NB/SB/WB, adjust phasing	-6.9
	Roundabout – Two lane	-40.1
10 Mile Rd. & Meadowbrook Rd.	Signal – Add dual left turns NB/SB, adjust signal phasing	-2.5
	Roundabout – Two lane with one lane NB and SB approaches	-31.4
10 Mile Rd. & Haggerty Rd.	Signal – Add dual left turns EB/WB, add right turn lane NB/SB/EB, adjust phasing	-18.1
	Roundabout – Two lane	-45.7

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INTRODUCTION

10 Mile Road is a minor arterial roadway within the city limits of Novi in Oakland County. Recurrent congestion on 10 Mile Road prompted the city to commission a corridor study to assess the present and anticipated operational and safety performance of 10 Mile within the city limits. OHM developed this study on behalf of the City of Novi and in conjunction with the Road Commission for Oakland County (RCOC). For modeling purposes, the study area extended beyond the City boundaries and consists of 10 Mile Road and all signalized intersections between the South Lyon East High School driveway / Lyon Ridge Drive at the west end and Research Drive just east of I-275 on the east end.

PUBLIC INVOLVEMENT

A public open house meeting was held on April 29, 2019 in order to identify user experiences with the 10 Mile Corridor and help incorporate this study with the City planning process. This highly attended meeting provided multiple ways for road users to provide feedback, including a formal comment form, handwritten notes left on aerial images and conversations with representatives from the study team, the City of Novi and the RCOC. Community members who were unable to attend continued to reach out to study team members to provide additional feedback.

Aerial images at the meeting provided the opportunity for the identification of unique concerns with the existing corridor. Concerns raised on the western half of the corridor include sidewalk gaps between Wixom and Beck, the lack of a consistent center left turn lane, sight distance concerns near Terra Del Mar Dr., high speeds and truck traffic. There were also numerous comments on the new roundabout at Napier Rd., including compliments on the congestion relief and concerns on the reduction of gaps for driveways near the roundabout. Similar comments on speed, truck traffic and a lack of a consistent center left turn lane were noted on the eastern half of the corridor. Other concerns in this portion of the study area include congestion at major intersections, safety concerns where auxiliary lanes are merging and difficulty turning in and out of side streets. Concerns noted near the high school include high speeds and inexperienced drivers causing a perceived safety concern. A summary of comments from the aerial images is included in the appendix.

Comment forms, received both during the meeting and thereafter, provided additional space for more general comments applying to the whole corridor. Many of the respondents indicated that they lived either on 10 Mile or in adjacent neighborhoods with access to 10 Mile. Safety was a major theme of these comments with many forms noting high speeds, high volumes and lack of turn lanes as concerns. Another theme was mobility including comments on lack of adequate lanes, difficulty turning in or out of driveways, lack of nonmotorized facilities and subdivision cut through traffic. A summary of comments from the comment forms is included in the appendix.

SAFETY ANALYSIS

A crash analysis of the study area was preformed to review the historical safety performance of the corridor and identify patterns and trends in the crash date. Collision data was obtained from the Traffic Improvement Association's (TIA) Traffic Crash Analysis Tool (TCAT) for a three-year period, encompassing 2015 through 2017. The analysis looked at crash data at each of the

thirteen signalized intersections. In addition, the segments of roadway between these intersections was analyzed to identify additional data patterns. Appendix A contains the TIA crash summary reports as well as the individual UD-10 crash reports for crashes resulting in serious injuries. The crash data is summarized in Tables 1a and 1b.

Crash rates for intersections are expressed in terms of crashes per million entering vehicles. For roadway segments, the crash rates are expressed as crashes per hundred million vehicle miles of travel. The spot critical crash rate represents a calculated rate using an average crash rate determined by four characteristics which include area type, functional class, number of lanes, and traffic control. The average crash rates were determined and published by the Southeast Michigan Council of Governments (SEMCOG) in its Traffic and Safety Manual using crash data from southeast Michigan from 2009 to 2011. When the observed crash rate exceeds the spot critical crash rate, the location is identified as a high-crash location. Seven of the thirteen study intersections were identified as high crash intersections, as indicated in Table 1a. Two of the twelve study segments were also identified as high crash segments.

During the 3-year analysis period a total of 782 crashes occurred in the study area. ***There were no fatal crashes during the analysis period.*** Injuries occurred in 23% of the crashes. 7 of the injury crashes resulted in incapacitating Type A injuries. These crashes are discussed in greater detail below. There were also 51 non-incapacitating Type B injuries and 120 possible Type C injuries in the study period. Ten crashes involved either a bicyclist or a pedestrian, all of which occurred at intersections or driveways along the road. Most of these crashes occurred as a result of drivers failing to yield to bicyclists or pedestrians in the crosswalk.

High-Crash Intersections

The observed crash rate exceeded the spot critical crash rate at 7 signalized intersections within the study area. The highest crash rate to spot critical crash rate ratio occurred at the 10 Mile Road at Napier Road intersection. One A injury crash involved a collision between a semi-truck and a passenger vehicle at this location. The passenger vehicle failed to stop at a red light leading to a collision where both vehicles landed in a nearby ditch. The crash data at this location covered the time period prior to the construction of a roundabout in late 2017. Crash patterns and trends after the roundabout construction are anticipated to be substantially different from the data collected when this location was a signalized intersection.

Table 1a: 10 Mile Road Corridor Crash Summary - Intersections

Intersection	Crash Type									Injuries					Crash Rate	Spot Critical Crash Rate
	Single Vehicle	Head-On	Head-On Left-Turn	Sideswipe	Rear End	Angle	Backing	Other	TOTAL	Fatal	A	B	C	O		
10 Mile & Lyon Ridge	1	0	1	1	10	0	0	0	13	0	0	1	1	11	0.740	1.032
10 Mile & Napier	5	0	3	5	16	24	3	1	57	0	1	4	4	48	2.776	1.004
10 Mile & Oak Point	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0.063	1.053
10 Mile & Wixom	2	0	7	1	10	3	0	0	23	0	0	3	4	16	0.956	1.025
10 Mile & Beck	0	1	11	6	64	4	1	0	87	0	1	4	13	69	2.517	0.960
10 Mile & Taft	4	0	2	0	27	2	0	0	35	0	0	4	2	29	1.288	1.006
10 Mile & Novi Way (West)	1	0	0	0	13	1	0	0	15	0	0	1	3	11	0.936	1.050
10 Mile & Churchill	2	0	2	0	13	1	0	0	18	0	0	1	4	13	0.990	1.026
10 Mile & Novi	0	0	7	15	49	30	0	0	101	0	0	2	19	80	2.431	0.937
10 Mile & Meadowbrook	1	0	2	10	24	12	2	0	51	0	0	2	8	41	1.750	0.996
10 Mile & Cranbrooke	1	0	0	2	7	0	0	0	10	0	0	1	4	5	0.645	1.057
10 Mile & Haggerty	5	3	13	13	40	20	2	0	96	0	3	5	9	79	2.332	0.938
10 Mile & Research Dr	1	0	0	2	13	4	1	0	21	0	0	4	3	14	1.261	1.042
Sub-Total	**23**	**4**	**48**	**55**	**287**	**101**	**9**	**1**	**528**	**0**	**5**	**32**	**74**	**417**		
Sub-Total %	**4%**	**1%**	**9%**	**10%**	**54%**	**19%**	**2%**	**0%**	**100%**	**0%**	**1%**	**6%**	**14%**	**79%**		

Table 1b: 10 Mile Road Corridor Crash Summary - Segments

Segment	Crash Type									Injuries					Crash Rate	Spot Critical Crash Rate
	Single Vehicle	Head-On	Head-On Left-Turn	Sideswipe	Rear End	Angle	Backing	Other	TOTAL	Fatal	A	B	C	O		
Lyon Ridge to Napier	1	1	1	0	11	10	0	0	24	0	0	4	4	16	**184.3**	**303.0**
Napier to Oak Point	2	0	1	1	2	0	0	0	6	0	0	1	1	4	**51.4**	**307.3**
Oak Point to Wixom	1	0	0	0	2	0	0	0	3	0	0	0	2	1	**15.5**	**340.8**
Wixom to Beck	5	1	0	2	14	2	0	0	24	0	0	1	3	20	**146.1**	**294.6**
Beck to Taft	4	0	1	2	21	7	0	0	35	0	0	1	7	27	**243.7**	**299.3**
Taft to Novi Way (West)	1	0	0	0	13	2	0	0	16	0	0	3	0	13	**263.7**	**339.5**
Novi Way (West) to Churchill	1	0	0	0	13	2	0	0	16	0	0	3	0	13	**194.9**	**343.9**
Churchill to Novi	1	0	0	0	10	5	0	0	16	0	0	1	0	15	**204.5**	**292.0**
Novi to Meadowbrook	7	0	1	9	36	15	0	0	68	0	**2**	3	17	46	**408.7**	**262.3**
Meadowbrook to Cranbrooke	2	0	0	1	10	1	0	0	14	0	0	0	2	12	**142.7**	**281.7**
Cranbrooke to Haggerty	1	0	1	2	14	7	0	0	25	0	0	4	4	17	**312.9**	**291.0**
Haggerty to Research	1	1	0	0	7	3	0	0	12	0	0	1	4	7	**172.4**	**297.8**
Sub-Total	**26**	**3**	**5**	**17**	**150**	**53**	**0**	**0**	**254**	**0**	**2**	**19**	**46**	**187**		
Sub-Total %	**10%**	**1%**	**2%**	**7%**	**59%**	**21%**	**0%**	**0%**	**100%**	**0%**	**1%**	**7%**	**18%**	**74%**		
Grand Total	**49**	**7**	**53**	**72**	**437**	**154**	**9**	**1**	**782**	**0**	**7**	**51**	**120**	**604**		
Grand Total %	**6%**	**1%**	**7%**	**9%**	**56%**	**20%**	**1%**	**0%**	**100%**	**0%**	**1%**	**7%**	**15%**	**77%**		

The intersection of 10 Mile Road and Beck Road had the second highest crash rate to spot critical crash rate ratio. One A injury crash occurred at this intersection involving a motorcycle struck by a passenger vehicle turning left during permissive left turn signal phasing. A high number of rear end crashes were recorded at this intersection. A significant contributing factor in many of these crashes were long queues due to congestion. Signal phasing and timing parameters are also potential factors in the observed crash patterns.

The intersection of 10 Mile and Taft is also considered a high crash intersection with a high number of rear end and single vehicle crashes. The diagonal span signal configuration may be impacting signal head visibility and contributing to some of the crashes at this intersection. There were two crashes involving bicyclists at this intersection. In both cases the cyclist was crossing in a marked crosswalk against the pedestrian signal indications and was struck.

The intersection of 10 Mile and Novi experienced the highest total number of crashes during the study period. The most prominent crash types at the intersection were rear end and angle crashes. Many of the angle crashes are related to commercial driveways located close to the intersection. Snowy or icy road conditions contributed to the number of rear end crashes occurring in the signal queue. The majority of crashes occurred during heavily congested time periods, where lane changes and adjacent driveway turning movements fall within the signal queue.

The intersection of 10 Mile and Meadowbrook is considered a high crash location with rear end, angle and sideswipe crashes being the prominent crash types. A high number of crashes occurred approximately 200 feet west of the intersection near multiple commercial driveways and the westbound merge to transition out of the 5-lane section at the roadway. The diagonal span signal configuration may be impacting signal head visibility and contributing to some of the crashes at this intersection. There was one crash involving a pedestrian at this intersection. The pedestrian was crossing in a marked crosswalk against the pedestrian signal indications when struck.

The intersection of 10 Mile and Haggerty is a high crash rate intersection. The number of head-on left turn and angle crashes are especially high at this location. Three Type A injury crashes occurred at the intersection of 10 Mile Road and Haggerty Road during the three year study period. All three Type A injuries occurred in head-on left turn crashes. The majority of the head-on left turn crashes at this intersection occur during the permissive left turn phase, especially towards the end of the permissive phase. Adjusting the clearance intervals at this intersection and considering moving the protected left turn phasing to lagging may help address some of this crash pattern.

The intersection of 10 Mile and Research Drive is another high crash rate intersection. Rear end crashes were the prominent crash type. The rear end crashes occurred on approach to the signal within the queue.

High-Crash Segments

The 10 Mile Road segment between Novi Road and Meadowbrook Road experienced the worst crash rate to spot critical crash rate ratio of all study segments. Contributing factors to many of the crashes in this segment include the inconsistent number of lanes, a lack of a center left turn lane and the high traffic volumes on this segment of roadway. Another factor in the high number of angle crashes at his intersection is the prevalence of commercial property access points. Two

separate rear-end crashes resulting in A-level injuries occurred in the segment of 10 Mile Road between Novi Road and Meadowbrook Road. Both Type A injury crashes were rear-end collisions occurring near the intersection with Pheasant Run. In both cases, the lane configuration, congestion and lack of a center left turn lane contributed to the crashes.

The 10 Mile Road segment between Cranbrooke and Haggerty was the other high-crash segment in the study area. The most prominent crash type in this segment were rear-end collisions. Contributing factors to many of the crashes in this segment include the inconsistent number of lanes, a lack of a center left turn lane and high traffic volumes. No fatalities or Type A injuries occurred in this segment during the study period.

TRAFFIC ANALYSIS

To obtain more detailed information for the analysis, traffic data was collected by Traffic Data Collection, LLC (TDC) on May 16 of 2018 at the study locations. The south leg of the roundabout at Napier Road was closed to through traffic due to road construction during data collection. The expected approach and turning movement volumes in the absence of a road closure were estimated based on existing traffic patterns in the study area. The morning peak period occurs between 7:30 AM and 9:00 AM, and the afternoon peak period occurs between 4:30 PM and 6:00 PM. The traffic volume data collected by TDC can be found in Appendix B.

Intersection Analysis Methodology

The study intersections were analyzed according to the methodologies published in the Highway Capacity Manual, 2010 edition. For this project, Synchro Version 10 was used to conduct the analysis for traditional signalized and un-signalized intersections. The intersection of 10 Mile Road and the Oak Point Church driveway was modeled as a two-way STOP-controlled intersection as the signal operates in flash mode during both peak periods. Existing and proposed roundabout intersections were analyzed using RODEL™ software. Software printouts for the evaluations of intersections have been included in Appendix C for Synchro and Appendix D for Rodel. These software package computes delay values based on factors such as number and type of lanes, intersection controls such as STOP signs or traffic signals, traffic volumes, pedestrian volumes, signal timing characteristics, roadway grade, speed limit, etc. This analysis determines the average delay experienced by vehicles. This value is an average across the entire peak hour. Vehicles arriving during the busiest portion of the peak hour or arriving in a clustered group of vehicles instead of in a random pattern could experience longer delays. On the other hand, vehicles arriving during a lighter portion of the peak hour could experience shorter delays. The average delay is used to determine the corresponding level of service (LOS) values for each intersection movement, as well as the intersection as a whole.

Table 2: Level of Service Criteria For Signalized Intersections

Level of Service	Average Delay/Vehicle (seconds)	Description
A	Less than or equal to 10	Most vehicles do not stop at all. Most arrive during the green phase. Little or no delay.
B	> 10 to 20	More vehicles stop than for LOS A. Still good progression through lights. Short traffic delays.
C	> 20 to 35	Significant numbers of vehicles stop, although many pass through without stopping.
D	> 35 to 55	Many vehicles stop. Individual signal cycle failures are noticeable. Progression is intermittent.
E	> 55 to 80	Considered to be the limit of acceptable delay. Individual cycle failures are frequent and progression is poor.
F	>80	Extreme and unacceptable traffic delays.

SOURCE: Transportation Research Board, Highway Capacity Manual 2010.

The LOS of an intersection is based on factors such as number and types of lanes, intersection controls such as STOP signs or traffic signals, traffic volumes, pedestrian volumes, and others. LOS is expressed as a letter grade, in a range from A through F. In this context, 'A' represents the best conditions, with very little or no average delay to vehicles. LOS 'F' is the worst of conditions, equated with very large average delays and few gaps of acceptable length. Tables 2 and 3 identify level of service criteria and descriptions for signalized and un-signalized intersections, respectively.

Table 3: Level of Service Criteria For Unsignalized Intersections

Level of Service	Average Delay/Vehicle (seconds)	Description
A	0 to 10	Little or no delay, very low main street traffic
B	> 10 to 15	Short traffic delays, many acceptable gaps
C	> 15 to 25	Average traffic delays, frequent gaps still occur
D	> 25 to 35	Longer traffic delays, limited number of acceptable gaps
E	> 35 to 50	Very long traffic delays, very small number of acceptable gaps
F	>50	Extreme traffic delays, virtually no acceptable gaps in traffic

SOURCE: Transportation Research Board, Highway Capacity Manual 2010.

An intersection LOS D is considered by many traffic safety professionals to be the minimum acceptable condition in an urban/suburban area. For rural areas, most highway agencies consider LOS C the minimum. Given the location of the study intersections, with most residing within the city limits of Novi and all being inside the southeast Michigan urban boundary, LOS D was utilized as the study goal.

EXISTING CONDITIONS

Capacity analysis under existing conditions was performed at each of the study intersections. While LOS D will be used as the level of service threshold under future mitigated conditions, an intersection which operates at LOS D under existing conditions is expected to operate at LOS E or LOS F under future unmitigated conditions. Thus, for the purpose of analysis under existing

conditions, those intersections which operate at an overall LOS D or poorer are considered "locations of concern". The analysis of the locations operating at LOS C or better are considered to be of "moderate delay" and are discussed next. The remaining intersections are discussed further under locations of concern.

Projected Background Traffic

In order to provide operational analysis in future years, regional traffic growth must be added to the field counted volumes. Growth rates were selected in coordination with SEMCOG, RCOC and with City of Novi. Between 2018 and 2030 a background growth rate totaling 2% was used. Between 2018 and 2040 a background growth rate totaling 3% was used. This increase in traffic reflects regional development and changes in travel patterns.

Development Trip Generation

Much of the study area can be considered already developed. However, there are some available parcels in the western portion of the study area. In addition, there is the potential for some developed parcels to be further improved to increase density. Much of the traffic related to this type of development is included in the background growth. However, it is thought that a key parcel was not accounted for in the SEMCOG forecasting and needs to be added to the background growth values. There is a strong potential that the current Links of Novi golf course will redevelop within the analysis period. Pervious plans for this property have included various types of residential housing. Potential traffic generated by a residential development on the Links of Novi property was determined using procedures outlined in the Institute of Transportation Engineers (ITE) publication, Trip Generation Handbook. The data set used is the ITE Trip Generation Manual – 10th Edition.

Table 4: Links of Novi Summary of Development Generated Traffic

ITE Land Use	Size	AM Peak			PM Peak		
		Total	In	Out	Total	In	Out
210 - Residential Single Family	450 Units	333	83	250	446	281	165

During the AM Peak Hour, the redevelopment of the Links of Novi property is anticipated to add 333 trips to the existing traffic. During the PM Peak Hour, the redevelopment of the Links of Novi property is anticipated to add 446 trips.

Development Trip Distribution

The potential residential development at the Links of Novi property is expected to be similar in use and character to the numerous other residential developments along Novi road. With this understanding, the projected residential development is expected to be reflective of the existing residential uses in the development vicinity. The development generated trips were routed through the study intersections utilizing existing traffic patterns. These trips were then added to the background traffic volumes to develop the future year traffic volumes for the 2030 and 2040 traffic analysis.

LOCATIONS OF MODERATE DELAY

Table 5 shows the intersection LOS and corresponding delays during the AM Peak hour. Table 6 shows the intersection LOS and corresponding delays during the PM Peak hour. Under existing conditions, the study intersections of moderate delay experience average overall intersection vehicle delays which correspond with a LOS A, LOS B or LOS C during both the AM

and PM Peak periods. However, northbound and southbound approach delay and level of service values are shown to fall outside the acceptable range at numerous locations. With the addition of future development traffic and background growth, congestion throughout the study corridor is expected to increase, leading to further degradation of LOS.

Table 5: Locations of Moderate Delay: AM Peak Delay and Level of Service

	Analysis Year	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
10 Mile Rd. & Lyon Ridge Dr.	2018	**42.0**	**D**	34.5	C	21.2	C	34.3	C	27.2	C
	2030	**53.7**	**D**	**37.7**	**D**	21.2	C	34.6	C	28.6	C
	2040	**53.5**	**D**	**37.6**	**D**	22.4	C	39.0	D	30.6	C
10 Mile Rd. & Napier Rd.	2018	5.7	A	4.9	A	8.0	A	4.5	A	6.8	A
	2030	5.9	A	5.1	A	8.4	A	5.0	A	7.1	A
	2040	5.9	A	5.1	A	8.5	A	5.0	A	7.2	A
10 Mile Rd. & Oak Pointe Church Dwy.	2018	NA	NA	10.8	B	0.00	A	FREE	FREE	0.0	A
	2030	NA	NA	11.5	B	0.00	A	FREE	FREE	0.0	A
	2040	NA	NA	11.6	B	0.00	A	FREE	FREE	0.0	A
10 Mile Rd. & Novi Way (West)	2018	32.8	C	NA	NA	29.5	C	9.5	A	21.1	C
	2030	**39.2**	**D**	NA	NA	23.2	C	6.0	A	17.1	B
	2040	**39.1**	**D**	NA	NA	23.6	C	6.3	A	17.4	B
10 Mile Rd. & Churchill Blvd. / Courtland Blvd.	2018	25.2	C	**38.3**	**D**	2.9	A	12.3	B	11.7	B
	2030	26.3	C	**39.1**	**D**	2.5	A	9.3	A	10.3	B
	2040	26.3	C	**39.0**	**D**	2.6	A	9.4	A	10.4	B
10 Mile Rd. & Bashian Dr. / Cranbrooke Dr.	2018	**45.1**	**D**	**39.4**	**D**	14.7	B	4.0	A	14.5	B
	2030	**46.8**	**D**	**40.2**	**D**	14.1	B	0.8	A	13.4	B
	2040	**46.5**	**D**	**40.2**	**D**	14.6	B	0.8	A	13.6	B
10 Mile Rd. & Research Dr.	2018	29.7	C	NA	NA	3.2	A	3.7	A	5.0	A
	2030	**38.8**	**D**	NA	NA	3.2	A	3.2	A	5.3	A
	2040	**38.8**	**D**	NA	NA	3.2	A	3.3	A	5.3	A

Table 6: Locations of Moderate Delay: PM Peak Delay and Level of Service

	Analysis Year	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
10 Mile Rd. & Lyon Ridge Dr.	2018	23.6	C	**39.5**	**D**	7.4	A	23.8	C	19.5	B
	2030	25.5	C	**39.5**	**D**	11.3	B	32.1	C	24.9	C
	2040	25.4	C	**39.5**	**D**	11.5	B	33.3	C	25.5	C
10 Mile Rd. & Napier Rd.	2018	9.0	A	7.6	A	6.5	A	6.2	A	7.7	A
	2030	9.8	A	8.1	A	6.9	A	6.4	A	8.3	A
	2040	6.4	A	8.2	A	7.0	A	9.9	A	8.4	A
10 Mile Rd. & Oak Pointe Church Dwy.	2018	NA	NA	19.3	C	0.00	A	FREE	FREE	0.3	A
	2030	NA	NA	24.1	C	0.00	A	FREE	FREE	0.3	A
	2040	NA	NA	24.3	C	0.00	A	FREE	FREE	0.3	A
10 Mile Rd. & Novi Way (West)	2018	**48.9**	**D**	NA	NA	28.6	C	6.4	A	17.6	B
	2030	**63.5**	**E**	NA	NA	12.6	B	3.4	A	10.0	A
	2040	**63.5**	**E**	NA	NA	12.9	B	3.5	A	10.1	B
10 Mile Rd. & Churchill Blvd. / Courtland Blvd.	2018	27.8	C	**37.4**	**D**	5.2	A	5.9	A	7.7	A
	2030	31.8	C	**41.0**	**D**	11.0	B	6.7	A	10.5	B
	2040	31.8	C	**41.0**	**D**	11.1	B	6.8	A	10.6	B
10 Mile Rd. & Bashian Dr. / Cranbrooke Dr.	2018	**56.8**	**E**	30.4	C	2.5	A	16.7	B	14.8	B
	2030	**60.1**	**E**	31.0	C	1.9	A	9.8	A	10.5	B
	2040	**60.5**	**E**	31.3	C	1.9	A	10.0	B	10.7	B
10 Mile Rd. & Research Dr.	2018	**36.6**	**D**	NA	NA	7.6	A	9.0	A	14.5	B
	2030	**40.0**	**D**	NA	NA	12.5	B	7.9	A	16.1	B
	2040	**40.2**	**D**	NA	NA	12.6	B	8.0	A	16.2	B

LOCATIONS OF CONCERN

The effects of the current level of congestion are more pronounced at the remaining study intersections. These locations currently experience lengthy delays, long queues and a poor level-of-service on one or more approaches. These existing deficiencies are expected to worsen with background and future development traffic growth. Intersection LOS and corresponding delays during the AM Peak Hour and PM Peak Hour can be seen in Tables 7 and 8.

Table 7: Locations of Concern: AM Peak Delay and Level of Service

	Analysis Year	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
10 Mile Rd. & Wixom Rd.	2018	27.7	C	74.8	E	10.2	B	8.6	A	18.8	B
	2030	35.0	C	47.7	D	16.8	B	15.5	B	20.5	C
	2040	35.0	C	47.8	D	17.4	B	15.5	B	20.9	C
10 Mile Rd. & Beck Rd.	2018	46.5	D	38.8	D	38.1	D	22.7	C	38.4	D
	2030	78.9	E	52.8	D	45.4	D	35.4	D	55.8	E
	2040	83.1	F	53.8	D	46.4	D	35.7	D	57.8	E
10 Mile Rd. & Taft Rd.	2018	47.0	D	60.8	E	16.7	B	13.8	B	31.4	C
	2030	49.8	D	68.5	E	16.1	B	12.8	B	32.7	C
	2040	49.9	D	69.2	E	16.5	B	13.4	B	33.2	C
10 Mile Rd. & Novi Rd.	2018	35.9	D	33.6	C	32.6	C	34.7	C	34.2	C
	2030	35.8	D	30.8	C	53.0	D	44.8	D	42.2	D
	2040	36.2	D	31.2	C	54.3	D	44.1	D	42.7	D
10 Mile Rd. & Meadowbrook Rd.	2018	45.1	D	41.9	D	13.4	B	22.2	C	26.4	C
	2030	41.3	D	42.1	D	14.7	B	16.5	B	24.6	C
	2040	48.7	D	45.9	D	14.0	B	15.9	B	26.3	C
10 Mile Rd. & Haggerty Rd.	2018	46.9	D	32.4	C	47.8	D	50.1	D	45.1	D
	2030	69.1	E	36.2	D	43.0	D	60.2	E	54.5	D
	2040	73.2	E	36.5	D	43.0	D	60.9	E	56.2	E

Table 8: Locations of Concern: PM Peak Delay and Level of Service

	Analysis Year	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
10 Mile Rd. & Wixom Rd.	2018	15.4	B	42.6	D	15.8	B	25.8	C	28.3	C
	2030	26.4	C	123.1	F	14.1	B	17.4	B	51.5	D
	2040	26.4	C	126.4	F	15.1	B	17.9	B	53.0	D
10 Mile Rd. & Beck Rd.	2018	74.2	E	56.0	E	34.5	C	66.3	E	59.2	E
	2030	124.2	F	70.8	E	27.3	C	93.8	F	82.4	F
	2040	127.6	F	72.9	E	27.6	C	95.9	F	84.5	F
10 Mile Rd. & Taft Rd.	2018	53.7	D	64.7	E	36.3	D	31.9	C	42.4	D
	2030	78.9	E	70.1	E	15.6	B	30.4	C	42.5	D
	2040	80.1	F	71.5	E	15.6	B	31.0	C	43.2	D
10 Mile Rd. & Novi Rd.	2018	64.4	E	55.1	E	43.5	D	27.8	C	48.7	D
	2030	58.3	E	37.0	D	38.2	D	62.2	E	49.6	D
	2040	61.1	E	37.5	D	38.6	D	65.4	E	51.5	D
10 Mile Rd. & Meadowbrook Rd.	2018	54.8	D	41.6	D	29.8	C	28.2	C	35.9	D
	2030	57.0	E	44.3	D	31.8	C	35.7	D	40.3	D
	2040	56.8	E	49.9	D	31.1	C	34.7	C	41.0	D
10 Mile Rd. & Haggerty Rd.	2018	34.1	C	75.8	E	53.2	D	65.7	E	59.0	E
	2030	75.8	E	43.3	D	49.1	D	68.5	E	60.2	E
	2040	77.5	E	44.3	D	49.6	D	71.1	E	61.8	E

10 Mile Road and Wixom Road
10 Mile Road and Wixom Road currently operates at an overall acceptable level of service during both peak periods. The southbound Wixom Road approach operates at a LOS E in the AM and a LOS D in the PM. The signalized intersection has a dedicated left turn lane for each approach and short auxiliary right turn lanes for the 10 Mile Road approaches. The northbound approach to the intersection is the driveway for the City of Novi Fire Station Number 4. 10 Mile Road is a two-lane, two-way roadway in the vicinity of the intersection. Wixom Road has a three-lane section for a short stretch north of the intersection. For the future year analysis, increases in traffic volumes lead to lengthy queues and delays for the Wixom Road approach during the PM Peak period. As the Wixom Road approach delay increases, the overall intersection operates at a LOS D during the PM peak period.

10 Mile Road and Beck Road
10 Mile Road and Beck Road exhibits intersection traffic operations at a LOS D or LOS E in the AM and PM Peak periods, respectively. The signalized intersection has one dedicated lane for right turn, through and left turn movements on every approach. The existing cross section is a two-lane, two-way road on each approach except the westbound approach which has a center two-way left turn lane. The Synchro LOS reports indicate that the northbound left turn storage and/or split may not be adequate to service the traffic demand as modeled queue lengths (337 feet and 406 feet in the AM and PM Peak periods, respectively) exceed the given turn bay length (300 feet). Additionally, the eastbound and westbound through movements operate at LOS E in the respective AM and PM Peak periods. As these are the dominant movements in each peak period, there are likely inadequacies in either signal timing or lane capacity.

10 Mile Road and Taft Road
The 10 Mile Road and Taft Road intersection is shown to operate at LOS D in the PM Peak period. The signalized intersection has a single dedicated lane for each movement on every approach except the southbound approach which shares the right turn and through movements on a single lane with a dedicated left turn lane. The roadway cross section is a three-lane roadway with a center left turn lane on each approach except the southbound approach with is a two-way, two-lane roadway. The southbound approach operates at LOS E, and both the northbound and southbound through movements operate at LOS E. This result indicates that the phase split and/or lane capacity for the northbound and southbound approaches may be inadequate.

10 Mile Road and Novi Road
10 Mile Road and Novi Road is expected to operate at LOS D in the PM Peak period. The signalized intersection has a dedicated left turn lane, a single through only lane, and a shared through and right turn lane on each approach. The existing cross section is a balanced five-lane roadway with a center left turn lane on each approach. The southbound and northbound approaches each operate at LOS E (the northbound left turn movement operates at LOS F). Additionally, the eastbound left turn movement operates at LOS E. Given that Novi Road handles the dominant traffic flow at the intersection, the northbound/southbound phase split may not be sufficient to handle the traffic demand.

10 Mile Road and Meadowbrook Road
10 Mile Road and Meadowbrook Road displays a LOS D during the PM Peak period. The signalized intersection has a single dedicated lane for each movement on the northbound and southbound approaches. The existing cross section on the northbound approach is a two-lane, two-way roadway that widens out to two approach lanes near the intersection with 10 Mile Road.

The existing cross section on the southbound approach is two lanes southbound and one lane northbound with a center left turn lane. On the eastbound and westbound approaches, the intersection has a dedicated left-turn lane, a through only lane, and a shared through and right turn lane. The existing cross section on the eastbound approach is two lanes eastbound and one lane westbound that widens out to include a second westbound lane and a center left turn lane in the vicinity of Meadowbrook Road. The existing cross section on the westbound approach is a two-lane, two-way roadway that widens out to include an additional approach and departing lane with a center left turn lane near the intersection. During the PM Peak period, the northbound approach exhibits the poorest performance with an overall approach LOS D (LOS E for the through and left turn movements). Similar to the other intersections of concern, it is possible that the northbound/southbound phase split does not meet the traffic demand during this period.

10 Mile Road and Haggerty Road

10 Mile Road and Novi Road is expected to operate at LOS D and LOS E in the AM Peak and PM Peak respectively. The signalized intersection has a dedicated left turn lane, a single through only lane, and a shared through and right turn lane on each approach. Haggerty Road has a five-lane section north of the intersection and transitions to a four-lane section south of the intersection. 10 Mile Road transitions to a four-lane section east of the intersection and a two-lane section to the west. The left turn lane storage provided by the variable cross sections is as little as 150' feet on the northbound approach. The high traffic volumes experienced on both roadways at this location result in lengthy delays and poor level of service on multiple approaches during both peak periods. Projected traffic growth at this location will further deteriorate the traffic conditions as shown by the 2030 and 2040 analysis.

ALTERNATIVE ANALYSIS

Upon review of the safety and operational performance of the existing roadway geometry, it is likely that some amount of roadway improvement may be necessary in the future. Potential alternatives were evaluated where crash data and/or existing operational data identified concerns.

10 Mile Road and Wixom Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes widening to provide an auxiliary southbound right turn lane with protected right turns overlapping with the protected left turn phasing on 10 Mile. The roundabout alternative consists of a single circulating lane except for eastbound where a second lane is provided. Heavy westbound and southbound right turn volumes are accommodated by providing right-turn bypass lanes.

Table 9: 10 Mile and Wixom Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	35.0	C	**47.7**	**D**	16.8	B	15.5	B	20.5	C
	Improved Signal	31.7	C	**40.2**	**D**	24.5	C	12.5	B	23.2	C
	Roundabout	0.1	A	5.2	A	11.0	B	8.3	A	9.5	A
2040 AM Peak	Existing	35.0	C	**47.8**	**D**	17.4	B	15.5	B	20.9	C
	Improved Signal	31.3	C	**39.9**	**D**	25.8	C	14.0	B	24.3	C
	Roundabout	0.1	A	5.2	A	11.1	B	8.4	A	9.6	A
2030 PM Peak	Existing	26.4	C	**123.1**	**F**	14.1	B	17.4	B	**51.5**	**D**
	Improved Signal	20.1	C	**48.9**	**D**	31.5	C	26.9	C	**35.5**	**D**
	Roundabout	4.8	A	11.6	B	6.9	A	13.3	B	10.7	B
2040 PM Peak	Existing	26.4	C	**126.4**	**F**	15.1	B	17.9	B	**53.0**	**D**
	Improved Signal	20.1	C	**49.6**	**D**	**33.6**	**D**	28.7	C	**37.0**	**D**
	Roundabout	4.8	A	11.8	B	7.0	A	13.6	B	10.9	B

The existing intersection experiences lengthy delays for the southbound approach during both peak periods. As traffic volumes increase, it is anticipated that the level of service for this approach will continue to deteriorate. With the southbound approach expected to operate at a LOS F during the PM Peak in both 2030 and 2040 analysis years.

The improved signal alternative provides a marginal improvement in operations during the future analysis years. The additional lane for the southbound approach reduces the delay for this approach during both peak hours and is especially impactful during the PM Peak. The signal phasing and timing changes allow for more balanced delay between the approaches and the overall intersection delay is slightly reduced in the PM Peak.

The roundabout alternative greatly reduces the southbound approach delay. This alternative demonstrates reduced and balanced delays for all approaches during both peak hours. The overall intersection is expected to operate at a LOS A in the AM Peak and a LOS B in the PM Peak in both 2030 and 2040.

10 Mile Road and Beck Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes the widening of Beck Road to a five-lane section through the intersection. This widening is in the early stages of planning with potential construction occurring prior to this studies future analysis years. The roundabout alternative consists of a two-lane roundabout.

Table 10: 10 Mile and Beck Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	**78.9**	**E**	**52.8**	**D**	**45.4**	**D**	**35.4**	**D**	**55.8**	**E**
	Improved Signal	30.7	C	24.2	C	**44.1**	**D**	**53.6**	**D**	**36.9**	**D**
	Roundabout	8.7	A	6.2	A	8.6	A	6.4	A	7.8	A
2040 AM Peak	Existing	**83.1**	**F**	**53.8**	**D**	**46.4**	**D**	**35.7**	**D**	**57.8**	**E**
	Improved Signal	32.8	C	32.0	C	34.8	C	**39.7**	**D**	34.3	C
	Roundabout	8.8	A	6.3	A	8.7	A	6.4	A	7.8	A
2030 PM Peak	Existing	**124.2**	**F**	**70.8**	**E**	27.3	C	**93.8**	**F**	**82.4**	**F**
	Improved Signal	**46.5**	**D**	31.8	C	34.6	C	**79.6**	**E**	**48.2**	**D**
	Roundabout	9.1	A	8.5	A	8.4	A	8.4	A	8.6	A
2040 PM Peak	Existing	**127.6**	**F**	**72.9**	**E**	27.6	C	**95.9**	**F**	**84.5**	**F**
	Improved Signal	**52.7**	**D**	34.0	C	**40.5**	**D**	**64.7**	**E**	**48.4**	**D**
	Roundabout	9.2	A	8.6	A	8.5	A	8.5	A	8.7	A

The existing intersection experiences lengthy delays on multiple approaches during both peak periods. As traffic volumes increase, it is anticipated that the level of service will continue to deteriorate. With the overall intersection expected to operate at a LOS E during the AM Peak and a LOS F in the PM Peak in both 2030 and 2040 analysis years.

The improved signal alternative provides improvement in operations during the future analysis years. The additional lanes on Beck Road reduces the delay for these approaches during both peak hours. These changes also allow for more green time to be assigned to the 10 Mile Road approaches, providing slight reductions in delay. While the anticipated operations are much improved, the westbound approach is still anticipated to operate at at LOS E during the PM Peak in both 2030 and 2040 analysis years.

The roundabout alternative greatly reduces the delay experienced at this intersection. This alternative demonstrates reduced and balanced delays for all approaches during both peak hours. The overall intersection is expected to operate at a LOS A for both peak periods in 2030 and 2040.

10 Mile Road and Taft Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes widening to provide an auxiliary southbound right turn lane. Protected right turn overlap phasing would also be added to all approaches. The roundabout alternative consists of two-lanes for the 10 Mile approaches and one-lane for the Taft Road approaches.

Table 11: 10 Mile and Taft Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	**49.8**	**D**	**68.5**	**E**	16.1	B	12.8	B	32.7	C
	Improved Signal	**43.8**	**D**	**55.8**	**E**	23.2	C	18.0	B	32.5	C
	Roundabout	12.3	B	8.9	A	7.0	A	6.1	A	8.1	A
2040 AM Peak	Existing	**49.9**	**D**	**69.2**	**E**	16.5	B	13.4	B	33.2	C
	Improved Signal	**43.7**	**D**	**55.6**	**E**	25.6	C	18.7	B	33.6	C
	Roundabout	12.5	B	8.9	A	7.1	A	6.1	A	8.2	A
2030 PM Peak	Existing	**78.9**	**E**	**70.1**	**E**	15.6	B	30.4	C	**42.5**	**D**
	Improved Signal	**53.8**	**D**	**54.8**	**D**	31.3	C	30.8	C	**39.1**	**D**
	Roundabout	11.7	B	12.4	B	6.0	A	8.2	B	9.0	A
2040 PM Peak	Existing	**80.1**	**F**	**71.5**	**E**	15.6	B	31.0	C	**43.2**	**D**
	Improved Signal	**54.2**	**D**	**54.9**	**D**	31.5	C	31.8	C	**39.7**	**D**
	Roundabout	11.8	B	12.6	B	6.0	A	8.3	A	9.1	A

The existing intersection experiences lengthy delays on the Taft Road approaches during both peak periods. As traffic volumes increase, it is anticipated that the level of service will continue to deteriorate. With the overall intersection expected to operate at a LOS D during the PM Peak in both 2030 and 2040 analysis years.

The improved signal alternative provides a marginal improvement in operations during the future analysis years. The additional lane for the southbound approach reduces the delay for this approach during both peak hours and is especially impactful during the PM Peak. The signal phasing and timing changes allow for a slight reduction in overall intersection delay in the PM Peak.

The roundabout alternative greatly reduces the delay experienced at this intersection. This alternative demonstrates reduced and balanced delays for all approaches during both peak hours. The overall intersection is expected to operate at a LOS A for both peak periods in 2030 and 2040.

10 Mile Road and Novi Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes widening on all four approaches. The 10 Mile road approaches would be widened to provide dual left turn lanes. Additional widening is used to provide auxiliary right turn lanes for both Novi road approaches and the westbound 10 Mile Road approach. The dual left turn lane approaches would be revised to only allow left turns during a protected phase. Protected right turn overlap phasing would be added to the approaches with designated right turn lanes. Switching the signal phasing on 10 Mile to split phase the left turns is also included in this alternative. The roundabout alternative consists of a two-lane roundabout.

Table 12: 10 Mile and Novi Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	**35.8**	**D**	30.8	C	**53.0**	**D**	**44.8**	**D**	**42.2**	**D**
	Improved Signal	33.3	C	29.6	C	**39.9**	**D**	32.4	C	34.8	C
	Roundabout	10.8	B	5.4	A	9.1	A	7.0	A	8.7	A
2040 AM Peak	Existing	**36.2**	**D**	31.2	C	**54.3**	**D**	**44.1**	**D**	**42.7**	**D**
	Improved Signal	33.5	C	29.7	C	40.2	**D**	32.8	C	**35.1**	**D**
	Roundabout	11.1	B	5.5	A	9.2	A	7.1	A	8.9	A
2030 PM Peak	Existing	**58.3**	**E**	**37.0**	**D**	**38.2**	**D**	**62.2**	**E**	**49.6**	**D**
	Improved Signal	**50.4**	**D**	**35.3**	**D**	**37.5**	**D**	**52.0**	**D**	**44.2**	**D**
	Roundabout	8.9	A	13.4	B	8.2	A	13.4	B	11.1	B
2040 PM Peak	Existing	**61.1**	**E**	**37.5**	**D**	**38.6**	**D**	**65.4**	**E**	**51.5**	**D**
	Improved Signal	**51.3**	**D**	**35.5**	**D**	**37.9**	**D**	**52.1**	**D**	**44.6**	**D**
	Roundabout	9.0	A	13.8	B	8.3	A	13.8	B	11.4	B

The existing intersection experiences lengthy delays on multiple approaches during both peak periods. As traffic volumes increase, it is anticipated that the level of service will continue to deteriorate. Individual approaches are expected to operate at a LOS E during the PM Peak for both 2030 and 2040 analysis years.

The improved signal alternative provides improvement in operations during the future analysis years. Some of the reduction in left turn delay from the dual turn lanes is offset by the change to protected only turn phasing, limiting the measurable improvement. The additional right turn lanes reduce the delay for these approaches during both peak hours. The anticipated operations of this alternative include acceptable LOS D operations for all approaches as well as the overall intersection during the peak hours in both 2030 and 2040.

The roundabout alternative greatly reduces the delay experienced at this intersection. This alternative demonstrates reduced and balanced delays for all approaches during both peak hours. The overall intersection is expected to operate at a LOS A in the AM Peak and a LOS B in the PM Peak in 2030 and 2040.

10 Mile Road and Meadowbrook Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes widening on the Meadowbrook approaches to provide dual left turn lanes. The dual left turn lane approaches would be revised to only allow left turns during a protected phase. Protected right turn overlap phasing would be added to the approaches with designated right turn lanes. The roundabout alternative consists of two-lanes for the 10 Mile approaches and one-lane for the Meadowbrook Road approaches. An additional right turn bypass lane will be provided for the heavy southbound right turn volumes.

Table 13: 10 Mile and Meadowbrook Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	**41.3**	**D**	**42.1**	**D**	14.7	B	16.5	B	24.6	C
	Improved Signal	**36.6**	**D**	33.2	C	20.7	C	**41.0**	**D**	30.6	C
	Roundabout	11.7	B	5.4	A	6.0	A	5.4	A	7.0	A
2040 AM Peak	Existing	**48.7**	**D**	**45.9**	**D**	14.0	B	15.9	B	26.3	C
	Improved Signal	**36.4**	**D**	33.1	C	20.9	C	**41.1**	**D**	30.7	C
	Roundabout	11.8	B	5.4	A	6.0	A	5.5	A	7.1	A
2030 PM Peak	Existing	**57.0**	**E**	**44.3**	**D**	31.8	C	**35.7**	**D**	**40.3**	**D**
	Improved Signal	**54.1**	**D**	**37.9**	**D**	32.0	C	**35.2**	**D**	**38.2**	**D**
	Roundabout	9.2	A	13.3	B	6.5	A	8.9	A	9.4	A
2040 PM Peak	Existing	**56.8**	**E**	**49.9**	**D**	31.1	C	34.7	C	**41.0**	**D**
	Improved Signal	**54.0**	**D**	**38.2**	**D**	32.0	C	**35.8**	**D**	**38.5**	**D**
	Roundabout	9.3	A	13.6	B	6.6	A	9.0	A	9.6	A

The existing intersection experiences lengthy delays on the Meadowbrook Road approaches during both peak periods. In addition, there are substantial delays on westbound 10 Mile in the PM Peak. As traffic volumes increase, it is anticipated that the level of service will continue to deteriorate. The northbound Meadowbrook approach is expected to operate at a LOS E during the PM Peak for both 2030 and 2040 analysis years.

The improved signal alternative provides improvement in operations during the future analysis years. Some of the reduction in left turn delay from the dual turn lanes is offset by the change to protected only turn phasing, limiting the measurable improvement. The anticipated operations of this alternative include acceptable LOS D operations for all approaches as well as the overall intersection during the peak hours in both 2030 and 2040.

The roundabout alternative greatly reduces the delay experienced at this intersection. This alternative demonstrates reduced and balanced delays for all approaches during both peak hours. The overall intersection is expected to operate at a LOS A during both peak hours in 2030 and 2040.

10 Mile Road and Haggerty Road

Alternatives developed for this intersection include both an improved signalized intersection and a roundabout intersection. The signal-controlled alternative includes widening on the 10 Mile approaches to provide dual left turn lanes. The dual left turn lane approaches would be revised to only allow left turns during a protected phase. Additional widening is used to provide auxiliary right turn lanes for both Haggerty Road approaches and the eastbound 10 Mile Road approach. Signal phasing changes include the addition of protected right turn overlap phasing for the designated right turn lanes and split phasing for the 10 Mile approaches. The roundabout alternative consists of a two-lane roundabout.

Table 14: 10 Mile and Haggerty Road Alternative Delay and Level of Service

	Alternative	NB		SB		EB		WB		Overall	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
2030 AM Peak	Existing	**69.1**	**E**	**36.2**	**D**	**43.0**	**D**	**60.2**	**E**	**54.5**	**D**
	Improved Signal	26.6	C	25.1	C	29.9	C	**54.9**	**D**	32.1	C
	Roundabout	10.8	B	5.5	A	8.3	A	8.9	A	8.8	A
2040 AM Peak	Existing	**73.2**	**E**	**36.5**	**D**	**43.0**	**D**	**60.9**	**E**	**56.2**	**E**
	Improved Signal	26.9	C	25.3	C	30.3	C	**54.9**	**D**	32.4	C
	Roundabout	11.1	B	5.6	A	8.4	A	9.0	A	9.0	A
2030 PM Peak	Existing	**75.8**	**E**	**43.3**	**D**	**49.1**	**D**	**68.5**	**E**	**60.2**	**E**
	Improved Signal	**37.3**	**D**	**46.7**	**D**	**37.7**	**D**	**46.0**	**D**	**42.9**	**D**
	Roundabout	7.2	A	**27.5**	**D**	8.5	A	12.1	B	15.1	C
2040 PM Peak	Existing	**77.5**	**E**	**44.3**	**D**	**49.6**	**D**	**71.1**	**E**	**61.8**	**E**
	Improved Signal	**37.5**	**D**	**48.6**	**D**	**37.6**	**D**	**46.6**	**D**	**43.7**	**D**
	Roundabout	7.2	A	**30.1**	**D**	8.6	A	12.4	B	16.1	C

The existing intersection experiences lengthy delays on all approaches during both peak periods. As traffic volumes increase, it is anticipated that the level of service will continue to deteriorate. The northbound and westbound approaches are expected to operate at a LOS E during both Peak hours I nboth 2030 and 2040. The overall intersection is expected to operate at a LOS E during the PM Peak Hour in 2030 and in both peak hours in 2040.

The improved signal alternative provides improvement in operations during the future analysis years. Some of the reduction in left turn delay from the dual turn lanes is offset by the change to protected only turn phasing, limiting the measurable improvement. The additional right turn lanes provide some reduction in delay for those approaches. The anticipated operations of this alternative include acceptable LOS D operations for all approaches as well as the overall intersection during the peak hours in both 2030 and 2040.

The roundabout alternative greatly reduces the delay experienced at this intersection. This alternative demonstrates reduced delays for all approaches during both peak hours. During the PM Peak, this alternative is expected to experience more moderate delay, operating at a LOS D, for the southbound approach. Although this approach delay is higher than the proposed roundabouts at other locations, it represents a reduction in delay over the existing and improved signal alternatives. If additional operational improvements are desired, additional lanes beyond a two-lane roundabout will be necessary. These would most likely take the form of one or more partial by-pass lanes. The overall intersection is expected to operate at a LOS A during the AM Peak and a LOS C during the PM Peak in 2030 and 2040.

10 Mile Road segment between Novi Road and Meadowbrook Road

Concerns about this segment were raised both in the safety analysis and in many public comments. Without consistency in the number of lanes, road users have difficulty navigating the roadway with left turns being especially problematic. Congestion on this portion of the corridor is high during the peak travel times. The congestion related to side streets and driveway movements adds to the high volumes and substantial queues at the major intersections on either end of the segment.

Improvements at the Novi Road and Meadowbrook Road intersections would provide some queue reduction at each end of the segment. In conjunction with any improvements to these intersections, the downstream merge tapers should be evaluated and lengthened if necessary to provide smooth transition in the number of lanes on 10 Mile. Signing and pavement markings may also need adjustment to provide consistent messaging where lanes are ending.

Apart from the intersections, the most substantial concern for this segment is the lack of a continuous center left turn lane. The widening of the roadway to provide a center left turn lane is expected to address many of the safety concerns in this segment and provide limited congestion relief. In some locations, a left turn passing lane has been provided in lieu of a center left turn lane. Where auxiliary lanes have been provided on the right side of the road additional analysis is needed to identify the need for the additional pavement before the pavement widening is designed.

10 Mile Road segment between Cranbrooke and Haggerty

As with the previous segment, concerns about this segment were also first identified in the safety analysis and in many public comments. The concerns on this segment are similar to the Novi to Meadowbrook segment, with road users have difficulty navigating the roadway safely. Congestion on this portion of the corridor is high during the peak travel times. The congestion related to side streets and driveway movements adds to the high volumes and substantial queues at the major Haggerty intersection.

Improvements at the Haggerty Road intersection would provide some queue reduction at that end of the segment. In conjunction with any improvements to this intersection, the downstream merge tapers should be evaluated and lengthened if necessary to provide smooth transition in the number of lanes on 10 Mile. Signing and pavement markings may also need adjustment to provide consistent messaging where lanes are ending.

Apart from this intersection, the most substantial concern for this segment is also the lack of a continuous center left turn lane. The widening of the roadway to provide a center left turn lane is expected to address many of the safety concerns in this segment and provide some congestion relief. In some locations, a left turn passing lane has been provided in lieu of a center left turn lane. Where auxiliary lanes have been provided on the right side of the road additional analysis is needed to identify the need for the additional pavement before the pavement widening is designed.

10 Mile Road Corridor

In addition to the road segments noted above, there are operational and safety concerns throughout the 10 Mile corridor. Many of the road segments have a similar variable number of lanes and a lack of a center left turn lane. The portions of the corridor with more lane consistency and a center left turn lane experience improved operations and safety compared to the segments discussed above. While other segments are not currently classified as high crash rate segments, potential improvements to add a continuous center turn lane should be considered throughout.

CONCLUSION

Under existing conditions, the majority of the intersections within the study area operate with moderate delay. While the overall average intersection delay is often within the acceptable range at these locations, many individual approaches operate at LOS D or LOS E during peak periods.

As traffic volumes are expected to increase throughout the 10 Mile Road study corridor with background growth and planned future developments, it will be necessary to monitor any further degradation of LOS at these intersections. While adjustments in signal timing and phasing will relieve the pressure somewhat at many locations, more substantial improvements will likely be necessary at locations throughout the corridor.

The variable number of lanes throughout the corridor has led to operational, safety and access concerns. Review of crash data indicates crash patterns related to the lack of a center left turn lane in multiple locations throughout the corridor. Two segments were identified as high crash locations, both of these segments saw strong patterns related to lane merges and the lack of a center left turn lane. The addition of a center left turn lane throughout the corridor would reduce these crash patterns, improve access for driveways and side streets and reduce traffic flow obstructions in the corridor.

In the future, the six intersections identified as locations of concern are expected to see long delays with approach and overall intersection LOS expected to be at a 'E' or 'F', particularly in the PM Peak period. Many of these intersections have already undergone substantial road widening and signal timing adjustments to attempt to minimize delays. At each location, additional widening and signal operational changes can offer some relief. In many cases this relief will be modest with delays remaining just barely acceptable. Alternatively, construction of a roundabout intersection at some or all of these intersections offers greater reduction in delay and commensurate improvement in safety. This type of improvement is also more substantial than the addition of a turn lane and implementation would likely need to be prioritized.

ARCHITECTS. ENGINEERS. PLANNERS.

OHM Advancing Communities℠

Preliminary Roadway Engineering Study
10 MILE ROAD
Meadowbrook Road to Haggerty Road

Technical Memorandum

City of Novi

Road Commission for Oakland County

May 20, 2019

1. INTRODUCTION

In coordination with the city-wide 10 Mile Road Corridor Study, the City of Novi requested that OHM Advisors further analyze the one-mile segment of 10 Mile Road between Meadowbrook Road and Haggerty Road. The goal of the analysis is to collaborate with the Road Commission for Oakland County (RCOC) to explore the anticipated impacts and costs of adding a continuous center left turn lane along 10 Mile Road, from Meadowbrook Road to Haggerty Road. The detailed findings are included herein.

10 Mile Road varies between 2 and 5 lanes, with the 5 lane sections occurring at the Meadowbrook and Haggerty Road signalized intersections. The area generally consists of a mix of commercial and residential properties, with several side streets and driveways present on both sides of the roadway. The topography is somewhat rolling with a variety of open and enclosed drainage systems that outlet to Bishop Creek or the Francis Drain / Ingersol Creek. These, as well as other features, are depicted in the Conceptual Illustrative Rendering (Exhibit A). A conceptual opinion of probable design, right-of-way, and construction cost has also been attached as Exhibit B.

2. DESIGN METHODOLOGY & ASSUMPTIONS

Roadway - General

The proposed 10 Mile Road improvement concept is based on the City of Novi's interest, in collaboration with the RCOC to improve traffic operations and safety by adding a consistent center left turn lane. The proposed concept intends to maximize the use existing roadway infrastructure, by combining rehabilitation and isolated reconstruction efforts.

Non-Motorized - General

According to the City of Novi's 2011 Non-Motorized Master Plan, the 10 Mile segment has been identified as a "Balanced Corridor" that balances motorized and non-motorized users. The Annual Non-Motorized Prioritization 2016-2017 Update shows proposed pathway on the south side of 10 Mile Road and is classified as a Top 20 Priority Segment. The north side of 10 Mile Road calls for new sidewalk to complete the existing gap in the northeast quadrant at Meadowbrook Road. This study examines a concept layout for a future pathway on the south side of 10 Mile Road, but does not include design or construction costs for the pathway as a part of the project. Additional proposed ROW or easements needed for pathway construction have not been thoroughly analyzed. These costs are not included in Exhibit B.

Several ADA sidewalk ramps in the corridor that crossing side streets will require upgrades to current standards. Ramp upgrades in combination with pedestrian push button upgrades will be necessary at signalized intersections, including 10 Mile / Meadowbrook and 10 Mile / Bashian / Cranbrooke.

Roadway Design Criteria Assumptions – We anticipate the following criteria as a part of the analysis:

- Attempt to minimize ROW impacts where possible. Proposed highway easements have been based on master plan ROW when applicable.
- Lane Widths
    - Existing lanes measured 11.5', and as-built plans show 11' lanes. No changes are anticipated.
    - 10 Mile is not on the 2019 MDOT Truck Operators Map, but is listed as a Designated Spring Weight Restriction route on the RCOC's Truck Operators Map

- Use a 45mph posted speed, 50mph design speed, with 575' merging tapers based on 50mph.
- Proposed right turn lanes based on RCOC permit guidelines (50' tangent section and 100' taper)
- Proposed 3.5" mill and resurface with 8" full depth HMA section in the proposed widened areas. The existing section varies with 22' wide HMA over Concrete center section and full depth HMA additions. Future pavement cores are recommended.
- Proposed 8' shoulder (4' paved, 4' aggregate) based on MDOT 3R guidelines
- Proposed 2' ditch with 1 on 3 side slopes (flow line 6'-8' from edge of shoulder)
- 22' Clear Zone based on chart 7.01.11 in the MDOT Road Design Manual. Guardrail design parameters as described in the MDOT Road Design Manual and MDOT Special Details.

Environmental Considerations:

- No wetlands identified on the U.S. Fish and Wildlife Services (USFWS) National Wetland Inventory map. However, wetlands might be present adjacent to the watercourses.
- USFWFS lists the potential for the following threatened and endangered species: Indiana Bat, Northern Long-Eared Bat, Rayed Bean, American Beetle, Eastern Massasauga Rattlesnake and the Snuffbox Mussel.
- A State and Federal Mussel review utilizing the Michigan ArcGIS Mussel map did not reveal any mussels within the study limits. However, State Threatened mussels were identified in the same watercourse south of Meadowbrook Lake and 9 Mile Road. Should the project move further into the design process we recommend scheduling a pre-application meeting with the MDEQ / EGLE early, allowing time for a mussel search and relocation efforts should they require it.
- EGLE / OCWRC stormwater volume and water quality
    - The Francis Drain (OCWRC) ends at the north side of 10 Mile Road, presumably at the existing culvert end section. Water flows south and becomes the Ingersol Creek which is carried by the existing culvert under 10 Mile Road.
    - Bishop Creek flows southward, crossing 10 Mile Road just west of Bethany Road
    - Stormwater detention requirements due to increased impervious surface will be determined further into the design process. We anticipate a combination of infiltration and detention (underground or surface) might be required. Hydrodynamic separators or other storm water treatment will be required at stream outlets.

Traffic Signals, Pavement Markings, Signs, and Construction Staging

- 10 Mile & Meadowbrook (2002)
    - Existing diagonal span, camera detection, flashing red left turns, Opticom.
    - Existing ADA upgrades are needed and the existing pedestrian signals are not countdown.
    - Propose modernizing the signal to box span, ADA upgrades, and new countdown pedestrian signals. The upgrades might require a highway easement in the northeast quadrant.
- 10 Mile & Bashian / Cranbrook (2002)
    - Existing diagonal span, camera detection, Opticom.
    - Existing ADA upgrades are needed and the existing pedestrian signals are not countdown.
    - Propose modernizing the signal to box span, ADA upgrades, and new countdown pedestrian signals.
- 10 Mile & Haggerty (2015)

  - Existing box span, flashing yellow arrow left turn lanes, current ADA ramps, and existing pedestrian signals
  - Propose only minor updates and signal staging for construction maintenance of traffic.
- The two signals will be rebuilt to current RCOC design standards including 6-bolt strain poles, flashing yellow arrow (FYA) left turn signals (where required), backplates and tethers. Pedestrian signals will be countdown type and pushbuttons / sidewalks will be designed to meet current ADA requirements.
- Pavement markings and permanent signs would be replaced.
- The proposed construction staging concept consists of replacing the Bishop Creek Culvert and the Ingersol Creek Culvert under isolated closures allowing for typical traffic patterns on either side. Once the culverts have been installed the road would be constructed one side at a time maintaining one-way traffic.

Utilities

- Public utility information is shown in Exhibit A based off of City of Novi GIS and field observation.
- An analysis of underground private utility information was not performed nor shown in Exhibit A. However some private utility impacts are anticipated based on field observation and are noted herein.

3. DETAILED PROPOSED CORRIDOR CONCEPT

10 Mile Road, Meadowbrook Road to LeBost Drive

- Existing
  - ROW and Driveway Access
    - North side varies from 33' to 60'. The south side ROW is 60'.
    - 41160 has existing parking within the ROW
    - 41075 has parking turnaround within the ROW
  - Roadway
    - 10 Mile at Meadowbrook consists of 5 lanes and reduces to 2 lanes at LeBost Dr
    - There are no turn lanes provided at LeBost Dr
  - Drainage - There is a mix of curbed and shoulder sections, with a low point near station 14+50. Stormwater drains via ditch to the low point, crosses 10 Mile Road and enters an existing storm sewer flowing east along the north side of the road.
  - Non-Motorized - The north side has existing 5' sidewalk while the south side does not.
- Proposed
  - Center left turn lane.
  - Right turn taper lane for EB LeBost Dr. with a 25' right turn lane allowing the existing parking at 41075 to be salvaged.
  - Curb and gutter for the missing sections:
    - Curb is proposed for the north side because an 8' shoulder and ditch would impact the existing sidewalk and parking at parcel 41160.
    - Curb on the south side allows for future pathway and minimizes yard impacts.
  - Relocate streetlight poles at 10 Mile / LeBost.
  - No highway easements are anticipated.

10 Mile Road, LeBost Drive to Bethany Way

- Existing
  - ROW and Driveway Access
    - North side ROW is 60'. The south side ROW starts at 60' and reduces to 33.
    - 40965 has existing parking within the ROW
    - 40905 and 40891 share a combined turn around within the ROW
    - 40890 has landscaping and a fence at the back of sidewalk located within the existing ROW. The existing fence is needed at the Bishop Creek culvert.
    - 40905 and 40891 share a combined turn around within the ROW
    - 40755 is heavily landscaped and has a decorative fence within the ROW
  - Roadway –
    - Existing 2 lane roadway with no turn lanes. 10 Mile widens at Coral Ln to allow for a center left turn lane and right turn lane at Bethany Way.
    - Both the sides of the roadway have guardrail in the Bishop Creek culvert vicinity that does not meet current standards.
  - Drainage
    - Existing ditches on both sides of the road flow east towards Bishop Creek.
    - The ditch on the north side enters a catch basin at Coral Ln, which is located at the edge of the shoulder and is significantly lower than the roadway. There is an existing storm sewer on the north side that outlets into the Bishop Creek Culvert.
    - East of Coral Ln, the north side is open shoulder with flow over the sidewalk to Bishop Creek.
    - The south side is open shoulder with ditch flow ending at a storm sewer inlet near sta 23+00. Curb and gutter begins near STA 24+00 and extends to Ripple Creek
  - Bishop Creek Culvert – See discussion below.
  - Non-Motorized - The north side has existing 5' sidewalk while the south side does not.

- Proposed
  - Center left turn lane
  - Right turn lane for WB 10 Mile onto LeBost Dr and Bethany Way
  - No right turn lane for Coral Ln since there are only 6 homes in a cul-de-sac
  - Re-align the sidewalk on the north side that pitches toward the road and add a new fence on the back of sidewalk
  - Eliminate the north side guardrail, if clear zone is met. It appears that the existing headwall and fill slope at the Bishop Creek Culvert are outside the clear zone.
  - Curb and gutter on both sides of the roadway:
    - Curb is proposed on the north side since an 8' shoulder and ditch would impact the existing sidewalk.
    - Curb is proposed on the south side because a shoulder and ditch would impact existing parking facilities, make it more difficult to construct a future pathway, and result in more front yard impacts.
    - Proposed catch basins outlet to existing storm sewer on the north side.
    - Widen roadway approximately 6' from the existing lane line to the north and south to allow for the center turn lane.

        - From Coral Lane to Bethany Way, the addition of curb and gutter will:
            - Minimize roadway widening to approximately the width of the curb over the existing culvert.
            - Eliminate the need to widen the existing shoulder and reduce roadway drainage across private property
    - A highway easement will be required on the south side of the Bishop Creek Culvert. We anticipate RCOC pursuing master plan ROW. (60')
    - Relocate streetlight poles at 10 Mile / LeBost
    - The condition and depth of the existing sanitary sewer and water main crossing the Bishop Creek culvert are not known and might be impacted by the new culvert crossing.
    - Bishop Creek Culvert
        - Existing 8 foot box culvert built in 1925 has been evaluated by recent culvert inspections to be in fair condition (rating of "5" one above poor) with some areas in poor condition with spalling and open cracks at the joints between original culvert section and subsequent culvert extensions on both ends.
        - Repairs to the deteriorated areas would consists of raising the north side headwall, culvert concrete joint patching, and guardrail modernization. It is difficult to forecast the remaining service life of structures in this fair to poor condition and deterioration tends to progress quickly leading to costly repairs and traffic interruptions. Considering the age, condition, and uncertain remaining service life of the culvert combined with the pending south side extension for the future pathway, a new culvert is recommended.
        - It is anticipated that the replacement structure will be approximately a 12' precast concrete box culvert with precast wingwalls and headwalls and heavy riprap at both ends. The headwalls will be located outside of the clear zone, allow for future pathway / sidewalk and eliminate the need for guardrail.

Figure 1: Bishop Ck Culvert south curb line

Figure 2: Bishop Ck Culvert WB travel edge

Figure 3: Bishop Ck Culvert, south side looking west

Figure 4: Bishop Ck Culvert, north side looking east

10 Mile Road, Bethany Way to Willowbrook Drive

- Existing
  - ROW and Driveway Access
    - North side ROW varies from 33' – 60'. The south side ROW is 60'
    - The existing 5' sidewalk on parcel 40700 is outside of the existing ROW
    - The existing sidewalk is partially outside the ROW and the existing ROW cuts into the curb-line at Willowbrook Dr.
    - Parcels 40655, 40611, 40573, and 40539 have existing parking within the ROW.
  - Roadway
    - Bethany Way at 10 Mile has a center left turn lane and right turn lane. The center left extents to Ripple Creek before tapering down at Amanda Ln.
    - There is not a right turn lane at Ripple Creek or Willowbrook Drive.
    - There is a school approximately ½ mile south of 10 Mile on Willowbrook.
    - There is a WB right turn lane at Amanda.
  - Drainage
    - The drainage pattern for this segment is split by and existing high point near STA 33+00 (near Amanda Ln).
    - Bethany Way to Amanda Ln.
      - Both sides of the road are curbed west of Ripple Creek. East of Ripple Creek both sides have open shoulders. Drainage flows west toward Bishop Creek. The north side has a mix of ditches and storm sewer. The south side of the roadway has a swale behind the existing curb and gutter that eventually enters a culvert outletting near Bishop Creek. There is shoulder point drainage east of Ripple Creek.
    - Amanda Ln. to Willowbrook Dr.
      - The north side of the road has a short segment of curb and gutter at Amanda Ln ending near the high point. The remainder of the north side is shoulder point drainage toward Willowbrook. The south side of the roadway has a shallow swale that drains to the east toward Willowbrook.

  - Non-Motorized - The north side of the roadway has existing 5’ sidewalk while the south side does not have any pedestrian facilities.
- Proposed
  - Center left turn lane
  - Right turn lane at Bethany Way and Amanda Lane
  - Right turn lane and taper at Ripple Creek.
  - 25’ right turn lane with 100’ taper at Willowbrook Dr. salvaging the parking at parcel 40539.
  - Widened shoulder on the north side from Bethany to Amanda, and curb and gutter on the south side.
    - Existing pavement widths allow for widened shoulder section along the north side with a ditch, and without impacting the existing sidewalk.
    - Curb and gutter on the south side to minimize yard impacts, allow for future pathway construction, and avoid impacting the existing parking at parcel 40655.
  - Curb and gutter on both sides of the roadway from Amanda to Willowbrook.
    - Curb and gutter is proposed on the north side to avoid impacts to the existing sidewalk.
    - Curb and gutter is proposed on the south side to minimize front yard impacts, allow for easer future pathway construction, and avoid impacting the existing parking at parcels 40611, 40573, and 40539.
  - A highway easement is anticipated in the northwest quadrant at Willowbrook to perform ADA sidewalk ramp upgrades. A triangular sliver isolated to the ramp area is anticipated.

10 Mile Road, Willowbrook Drive to Olde Orchard Street

- Existing
  - ROW and Driveway Access
    - The ROW varies from 33’ – 60’ on both sides.
    - The existing 5’ sidewalk on the north side is outside of the ROW for several hundred feet.
  - Roadway
    - 10 Mile Road starts and ends as a 2 lane road in this segment that widens to a center left turn lane and right turn lane at the signalized intersection of 10 Mile with Bashian Dr / Cranbrooke Dr.
    - There are right turn lanes at Willowbrook Dr and Olde Orchard Street.
    - Buckingham Ct does not have a right turn lane or taper.
  - Drainage - Both the north side and the south side of the roadway are open shoulders with drainage flowing toward the Francis Drain / Ingersol Creek. There are some areas of shoulder point drainage and others with a defined swale.
  - Non-Motorized - The north side of the roadway has existing 5’ sidewalk while the south side does not have any pedestrian facilities.
- Proposed
  - Center left turn lane
  - Right turn lanes with 100’ tapers at Willowbrook Dr, Bashian Dr, and Cranbrooke Dr
  - Willowbrook Drive to Bashian Drive / Cranbrooke Drive:

        - Open shoulder on the north side
        - Curb and gutter on the south side to minimize impacts to utilities and front yards, allow for easer future pathway construction. The existing trees adjacent to 10 Mile on 24165 Cranbrooke Dr. sit significantly higher than the existing roadway and will likely be impacted.
    - Bashian Drive / Cranbrooke Drive to Olde Orchard Street:
        - Shoulders on both sides of the road.
    - Highway easements are proposed on the north side of the roadway from Willowbrook Dr up to 24671 Olde Orchard St. (opposite Buckingham Ct). Master plan ROW (60') has been assumed to allow for ADA ramp upgrades, and to encompass the sidewalk and existing utilities. No record of an existing highway easement was available, however a future title search is recommended.

10 Mile Road, Olde Orchard Street to Karmin Boulevard

- Existing
    - ROW and Driveway Access - The north and south side have approximately 60' ROW
    - Roadway - 10 Mile Rd has 2 lanes over the Ingersol Creek. Right turn tapers at Olde Orchard St and Nilan Dr. There is guardrail on both sides. There are passing lanes near Karmin Blvd on each side.
    - Drainage
        - Open shoulders on both sides that drain to Francis Drain / Ingersol Creek. The south side of the road has existing catch basins in the flow line and a storm sewer flowing toward the creek.
        - There is an existing 48" sewer outlet on the west side of Ingersol Creek on the north side near the ROW. The Francis Drain flows from North to South and makes a near 90 degree bend before crossing 10 Mile. On the south side of the road, the creek makes a 90 degree bend to the west approximately 60' after exiting the culvert. There is an existing 12" sewer outlet into the east side of the creek approximately 15' south of the headwall.
    - Non-Motorized - The north side has existing 5' sidewalk while the south side does not. There is a crossing near Nilan Drive.
- Proposed
    - Center left turn lane
    - Right turn lanes at Olde Orchard St, Nilan Dr, and both sides of Karmin Blvd.
    - Curb and gutter on both sides with a short stretch of open shoulder west of Karmin.
    - New sidewalk and fence on the north side at the culvert.
    - No highway easements are anticipated, however temporary easements are likely.
    - Francis Drain / Ingersol Creek Culvert:
        - The existing culvert was built in 1925, and has been rated a "4" (poor condition) for two inspection cycles. The culvert shows deterioration at the culvert ends and scour issues noted. Spray foam has been recently placed as a temporary measure on the sections of culvert that have "rotted through" near the north end.

- Significant repair work and extension on both ends would be required for the proposed center and right turn lanes at a minimum along with scour countermeasures placed within the channel.
- Culvert replacement is the best long term solution at this location. It is anticipated that a proposed culvert size will increase to approximately a 16' precast concrete box culvert however the culvert size may increase based on the bankfull width determined at the EGLE pre-application meeting discussion.
- The proposed culvert should be realigned to better match the creek alignment.
- Extend culvert outside of the clear zone on both sides of the roadway allowing for the north side sidewalk, future south side pathway, proposed center left turn lanes, and the addition of full right turn lanes at Olde Orchard St and Nilan Dr.
- Install riprap channel from the existing 48" storm sewer outlet to the Francis Drain / proposed north culvert wingwall.

- The condition and depth of the existing sanitary sewer and water main crossing the Francis Drain / Ingersol Creek culvert are not known and might be impacted by the new structure.

Figure 5: Ingersol Ck Culvert, at north end

Figure 6: Ingersol Ck, north side 48 inch outlet

Figure 7: Ingersol Ck Culvert, north side

Figure 8:Ingersol Ck Culvert, north side looking west

Figure 9: Ingersol Ck Culvert, south side

Figure 10: Ingersol Ck Culvert, south side

10 Mile Road, Karmin Boulevard to Haggerty Road

- Existing
  - ROW and Driveway Access – ROW is 60' on the north side and varies from 33' to 60' on the south side.
  - Roadway - 10 Mile varies from 2 lanes to 5 lanes. The driveway to the medical complex just west of Haggerty is situated within the WB outside lane drop for 10 Mile Road.
  - Drainage - Both sides of 10 Mile Rd are open shoulders with ditches flowing toward Ingersol Creek, with the exception of the 5 lane section the roadway, which is curb and gutter on both sides of the road.
  - Non-Motorized - The north side of the roadway has existing 5' sidewalk while the south side does not have pedestrian facilities.
- Proposed
  - Connect a proposed center turn lane to the existing turn lane.
  - Extend the WB RT turn lane from Haggerty to Karmin, in lieu of a lane drop taper within the medical complex driveway.
  - Curb and gutter for the missing segments on the north side, and widened shoulder at parcel 39575 and 39555 with curb and gutter to the east continuing to Haggerty Rd.
  - No highway easements are anticipated.

4. CONCLUSIONS

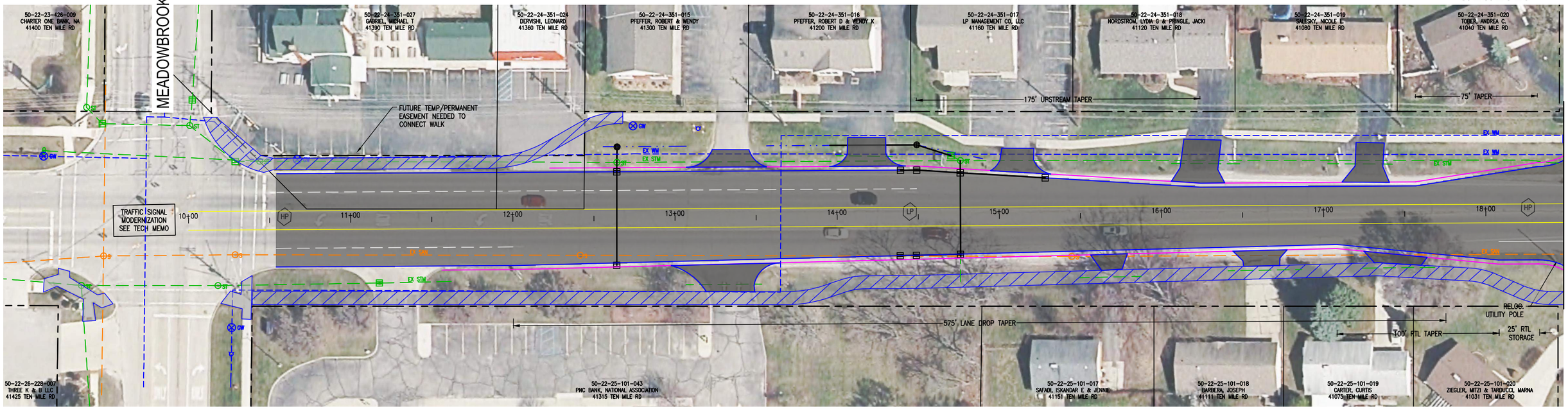
The analysis and collaboration with the RCOC revealed that the addition of the continuous center left turn lane (and the future addition of a pathway on the south side of 10 Mile Road) will necessitate other significant infrastructure improvements.

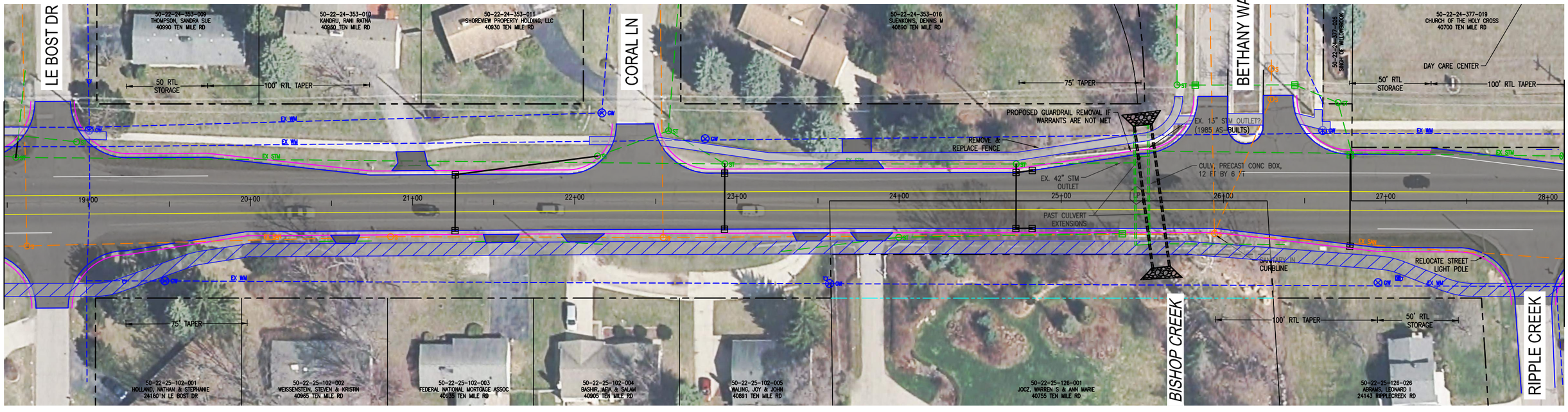
Due to the age and condition of the infrastructure, right-of-way constraints, and/or the need to enhance safety from driveway/sidestreet approaches, the following significant improvements are necessary: right turn lane additions, curb and gutter, enclosed storm sewer, 2 large culvert crossing replacements, and 2 traffic signal replacements.

In addition, approximately 5 (plus-minus) Highway Easements and several Temporary Easements will be necessary. The most significant ROW impact is at the south side of 10 Mile Road, at the Bishop Creek Culvert. Isolated public and private utility relocation might be necessary, primarily near the 2 culvert crossings.

10 MILE RD

EXHIBIT A
5/20/2019





SCALE: 1" = 60'

(11x17)

OHM Advancing Communities®

LEGEND

- EXISTING ROW
- PROPERTY LINE
- PROPOSED HIGHWAY EASEMENT
- PROPOSED ROADWAY
- PROPOSED WALK
- PROPOSED FUTURE PATHWAY
- PROPOSED EDGE OF PAVEMENT
- PROPOSED EDGE OF GRAVEL
- PROPOSED BACK OF CURB
- PROPOSED DITCH CENTERLINE
- PROPOSED STORM SEWER

10 MILE RD

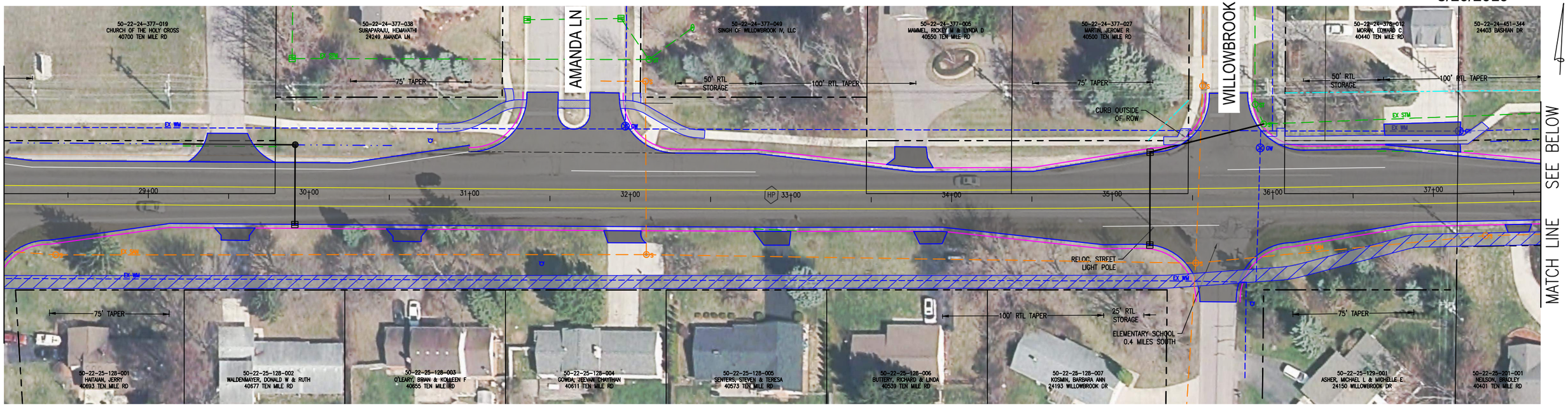
EXHIBIT A
5/20/2019

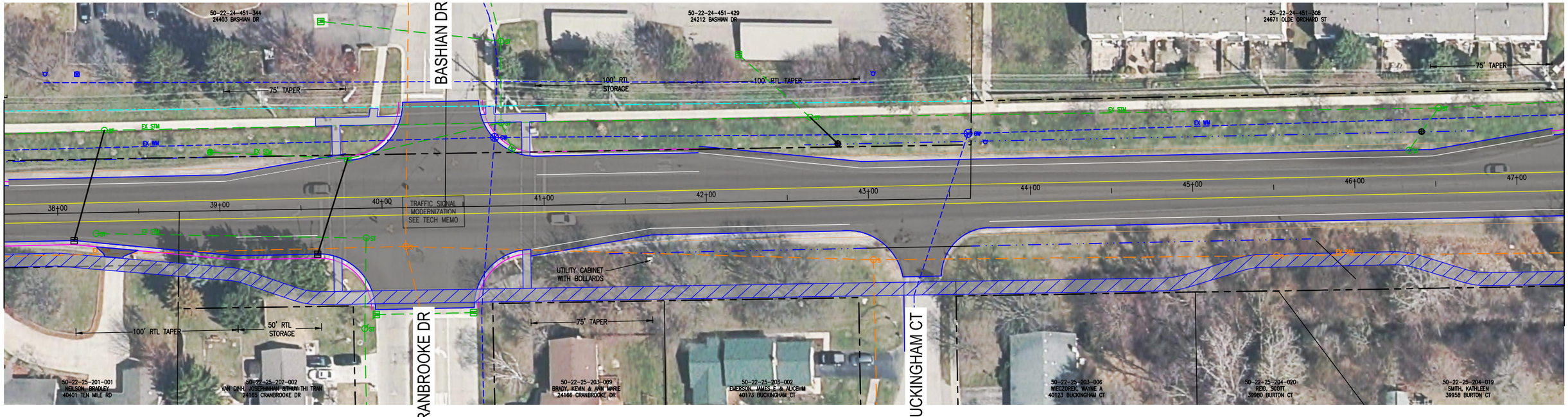
SEE PREVIOUS SHEET

SEE BELOW

MATCH LINE

MATCH LINE





SEE ABOVE

MATCH LINE

SEE NEXT SHEET

MATCH LINE

SCALE: 1" = 60'

(11x17)

OHM Advancing Communities®

LEGEND

- EXISTING ROW
- PROPERTY LINE
- PROPOSED HIGHWAY EASEMENT
- PROPOSED ROADWAY
- PROPOSED WALK
- PROPOSED FUTURE PATHWAY
- PROPOSED EDGE OF PAVEMENT
- PROPOSED EDGE OF GRAVEL
- PROPOSED BACK OF CURB
- PROPOSED DITCH CENTERLINE
- PROPOSED STORM SEWER

10 MILE RD

EXHIBIT A
5/20/2019

OLDE ORCHARD ST

FRANCIS DRAIN

KARMIN BLVD

NILAN DR

HAGGERTY RD

MATCH LINE SEE PREVIOUS SHEET

MATCH LINE SEE BELOW

MATCH LINE SEE ABOVE

50-22-24-451-308
24671 OLDE ORCHARD ST

50' RTL STORAGE

100' RTL TAPER

SIDEWALK NEEDS TO BE RELOCATED

DITCH PROTECTED WITH RIPRAP TO HINGE POINTS

REMOVE GUARDRAIL (CULVERT LOCATED OUTSIDE CLEARZONE)

50-22-24-476-019
EMH REALTY II, LLC
24245 KARMIN BLVD

HIGH SCHOOL

75' TAPER

50-22-24-476-021
COMMUNITY NETWORK SERVICES, INC
24230 KARMIN BLVD

50-22-24-476-034
DFCU FINANCIAL
39570 TEN MILE RD

EX 48" STM

EX WM

48+00

49+00

50+00

51+00

52+00

53+00

54+00

55+00

56+00

CULV, PRECAST CONC BOX, 16 FT BY 5 FT

PROPOSED GUARDRAIL REMOVAL IF WARRANTS ARE NOT MET (TYP)

REMOVE AND RELOCATE STORM OUTLET

EX STM

INGERSOL CREEK

50-22-25-204-018
EDEN, CARMEN ELENA
39940 BURTON CT

50-22-25-204-017
BATEMAN, RICHARD L & KATHLEEN
39922 BURTON CT

50-22-25-204-014
KANNANGARA, SHRANTHA
24181 NILAN DR

75' TAPER

100' RTL TAPER

25' RTL STORAGE

50' RTL STORAGE

50-22-25-226-017
REGENCY CAPITAL HOLDINGS OF NOVI
39595 TEN MILE RD

50-22-25-226-016
REGENCY CAPITAL HOLDINGS OF NOVI
39575 TEN MILE RD

50-22-25-226-018
REGENCY CAPITAL HOLDINGS OF NOVI
39555 TEN MILE RD

SCALE: 1" = 60'

(11x17)

50-22-24-476-034
DFCU FINANCIAL
39570 TEN MILE RD

50-22-24-476-033
NOVI MEDICAL PROPERTIES, LP
39500 TEN MILE RD

50-22-24-476-030
SUBURBAN HAGGERTY PROP 5, LLC
24295 HAGGERTY RD

EX WM

57+00

58+00

59+00

60+00

61+00

62+00

63+00

64+00

64+28

HP

9" CONC WIDENING (1985)

EX STM

175' UPSTREAM TAPER

50-22-25-226-018
REGENCY CAPITAL HOLDINGS OF NOVI
39555 TEN MILE RD

50-22-25-226-019
COMERICA PROPERTIES CORP
39475 TEN MILE RD

50-22-25-226-010
LEON, MORFID & DEBRA
39455 TEN MILE RD

50-22-25-226-011
LICARI, WILLIAM TRUST
39415 TEN MILE RD

OHM Advancing Communities®

LEGEND

- EXISTING ROW
- PROPERTY LINE
- PROPOSED HIGHWAY EASEMENT
- PROPOSED ROADWAY
- PROPOSED WALK
- PROPOSED FUTURE PATHWAY
- PROPOSED EDGE OF PAVEMENT
- PROPOSED EDGE OF GRAVEL
- PROPOSED BACK OF CURB
- PROPOSED DITCH CENTERLINE
- PROPOSED STORM SEWER

EXHIBIT B

OPINION OF PROBABLE CONSTRUCTION COST

ORCHARD, HILTZ & McCLIMENT, INC.
34000 Plymouth Road, Livonia, Michigan, 48150
Telephone: (734) 522-6711 FAX: (734) 522-6427

PROJECT: 10 Mile Rd - Meadowbrook to Haggerty - Exhibit B
LOCATION: City of Novi
WORK: Proposed center left turn lane, road resurfacing, drainage, and traffic signals.

DATE: May 20, 2019
PROJECT #: 0163-18-0020
ESTIMATOR: ACM
CHECKED BY: DGC
CURRENT ENR: JRK

ITEM CODE	DESCRIPTION	UNIT	TOTAL	UNIT PRICE	COST
	CATEGORY 1 -Roadway				
1500001	Mobilization, Max	LSUM	1	$ 334,000.00	$ 334,000.00
2020002	Tree, Rem, 19 inch to 36 inch	Ea	5	$ 500.00	$ 2,500.00
2020004	Tree, Rem, 6 inch to 18 inch	Ea	5	$ 150.00	$ 750.00
2030001	Culv, Rem, Less than 24 inch	Ea	16	$ 250.00	$ 4,000.00
2040020	Curb and Gutter, Rem	Ft	500	$ 6.00	$ 3,000.00
2040035	Guardrail, Rem	Ft	456	$ 1.50	$ 684.00
2040050	Pavt, Rem	Syd	795	$ 10.00	$ 7,950.00
2040055	Sidewalk, Rem	Syd	628	$ 7.00	$ 4,396.00
2040070	Utility Pole, Rem	Ea	3	$ 250.00	$ 750.00
2050010	Embankment, CIP	Cyd	4724	$ 9.00	$ 42,516.00
2050016	Excavation, Earth	Cyd	2324	$ 9.00	$ 20,916.00
2050041	Subgrade Undercutting, Type II	Cyd	2000	$ 25.00	$ 50,000.00
2057011	Excavation, Earth, RCOC	Syd	1694	$ 8.00	$ 13,552.00
2080036	Erosion Control, Silt Fence	Ft	1000	$ 2.00	$ 2,000.00
3027011	Aggregate Base, 6 inch, 21AA, RCOC	Syd	4380	$ 9.00	$ 39,420.00
3027011	Aggregate Base, 8 inch, 21AA, RCOC	Syd	5241	$ 12.00	$ 62,892.00
3077011	Shoulder, 21AA, 6 inch	Syd	914	$ 6.00	$ 5,484.00
4010641	Culv, Cl F, Conc, 12 inch	Ft	98	$ 25.00	$ 2,450.00
4020601	Sewer, Cl E, 15 inch, Tr Det B	Ft	1648	$ 65.00	$ 107,120.00
4030210	Dr Structure, 48 inch dia	Ea	34	$ 3,000.00	$ 102,000.00
4037051	Storm Detention and Treatment	LSUM	1	$ 250,000.00	$ 250,000.00
4047001	Underdrain, Subgrade, Open-Graded, 6 inch, RCOC	Ft	7282	$ 15.00	$ 109,230.00
5010002	Cold Milling HMA Surface	Syd	27864	$ 3.00	$ 83,592.00
5010005	HMA Surface, Rem	Syd	3961	$ 4.00	$ 15,844.00
5010051	HMA, 4E3	Ton	1236	$ 100.00	$ 123,600.00
5010057	HMA, 5E3	Ton	5771	$ 100.00	$ 577,100.00
5017031	HMA Approach, Commercial, 8 inch	Ton	232	$ 120.00	$ 27,840.00
5017031	HMA Approach, Residential, 6 inch	Ton	129	$ 120.00	$ 15,480.00
5017031	HMA Approach, Sidestreet, 8 inch	Ton	1183	$ 120.00	$ 141,960.00
6030090	Saw Cut, Intermediate	Ft	8627	$ 1.25	$ 10,783.75
8010005	Driveway, Nonreinf Conc, 6 inch	Syd	126	$ 32.00	$ 4,032.00
8020038	Curb and Gutter, Conc, Det F4	Ft	6743	$ 20.00	$ 134,860.00
8020050	Driveway Opening, Conc, Det M	Ft	539	$ 25.00	$ 13,475.00
8030010	Detectable Warning Surface	Ft	140	$ 35.00	$ 4,900.00
8030036	Sidewalk Ramp, Conc, 6 inch	Sft	2842	$ 7.00	$ 19,894.00
8030044	Sidewalk, Conc, 4 inch	Sft	2680	$ 3.00	$ 8,040.00
8070095	Post, Mailbox	Ea	50	$ 63.00	$ 3,150.00
8080011	Fence, Chain Link, 48 inch	Ft	250	$ 12.00	$ 3,000.00

ITEM CODE	DESCRIPTION	UNIT	TOTAL	UNIT PRICE	COST
	CATEGORY 1 -Roadway				
8107051	Pavement Marking & Signing	LSUM	1	$ 12,000.00	$ 12,000.00
8127051	Maintenance of Traffic	LSUM	1	$ 80,000.00	$ 80,000.00
8167011	Turf Establishment, THM Seed, Regular Mulch, Performance, R	Syd	5867	$ 7.00	$ 41,069.00
8230170	Water Main, DI, 16 inch, Tr Det F	Ft	500	$ 160.00	$ 80,000.00
8257001	Sanitary Sewer, 10 inch, Tr Det F	Ft	500	$ 100.00	$ 50,000.00
	CATEGORY 2 -Bishop Creek Culvert				
2040060	Structures, Rem	LSUM	1	$ 30,000.00	$ 30,000.00
2060002	Backfill, Structure, CIP	Cyd	336	$ 25.00	$ 8,400.00
2060010	Excavation, Fdn	Cyd	583	$ 20.00	$ 11,660.00
4060005	Culv Bedding, Box Culv	Cyd	64	$ 65.00	$ 4,160.00
4060147	Culv, Precast Conc Box, 12 foot by 6 foot	Ft	88	$ 2,500.00	$ 220,000.00
4067050	Precast Wingwalls	Ea	4	$ 8,000.00	$ 32,000.00
8137011	Riprap, Heavy, RCOC	Syd	89	$ 100.00	$ 8,900.00
	CATEGORY 3 -Ingersol Creek Culvert				
2040060	Structures, Rem	LSUM	1	$ 30,000.00	$ 30,000.00
2060002	Backfill, Structure, CIP	Cyd	362	$ 25.00	$ 9,050.00
2060010	Excavation, Fdn	Cyd	700	$ 20.00	$ 14,000.00
4060005	Culv Bedding, Box Culv	Cyd	64	$ 65.00	$ 4,160.00
4067001	Culv, Precast Conc Box, 16 foot by 5 foot	Ft	88	$ 2,900.00	$ 255,200.00
4067050	Precast Wingwalls	Ea	4	$ 8,000.00	$ 32,000.00
8137011	Riprap, Heavy, RCOC	Syd	267	$ 100.00	$ 26,700.00
	CATEGORY 4 -Traffic Signal Modernization				
8197051	10 Mile & Cranbrooke/Bashian Traffic Signal Work	LSUM	1	$ 175,000.00	$ 175,000.00
8197051	10 Mile & Haggerty Traffic Signal Work	LSUM	1	$ 15,000.00	$ 15,000.00
8197051	10 Mile & Meadowbrook Traffic Signal Work	LSUM	1	$ 185,000.00	$ 185,000.00

SUBTOTAL FOR CATEGORY 1 -Roadway	$ 2,616,229.75
SUBTOTAL FOR CATEGORY 2 -Bishop Creek Culvert	$ 315,120.00
SUBTOTAL FOR CATEGORY 3 -Ingersol Creek Culvert	$ 371,110.00
SUBTOTAL FOR CATEGORY 4 -Traffic Signal Modernization	$ 375,000.00
CONTINGENCY (20%)	$ 523,000.00
TOTAL OPINION OF PROBABLE CONSTRUCTION COST =	**$ 4,200,459.75**
ROW (*22,300 SFT Residential Land @ $12/sft*)	$ 267,600.00
Design Engineering @ 10%	$ 420,000.00
Less $20,500 (Corridor Study)	$ 399,500.00
Construction Engineering @ 14%	$ 588,000.00
TOTAL OPINION OF PROBABLE PROJECT COST =	**$ 5,455,559.75**

MEMORANDUM

TO: JEFFREY HERCZEG, DIRECTOR OF PUBLIC WORKS

FROM: GEORGE D. MELISTAS, ENGINEERING SR. MANAGER

SUBJECT: NOVI ROAD CORRIDOR TRAFFIC OPERATIONS AND IMPROVEMENTS – 10 MILE TO TWELVE OAKS MALL

DATE: OCTOBER 8, 2018

City Council has set a long-term goal to relieve traffic congestion along the Novi Road Corridor from 10 Mile Road to Twelve Oaks Mall as well as implement recommendations from the Transportation Master Plan of 2015. The City's Department of Public Works and Community Development have been working collaboratively with the City's Traffic Engineering Consultant, AECOM, to analyze traffic conditions along this corridor. This analysis includes identifying areas for improvement, locating opportunities to implement any recommended measures and developing future concepts for improving the transportation infrastructure in the area while planning for future developments.

The City has endeavored two recent transportation studies to the Novi Road corridor: the 2016 Thoroughfare Master Plan (*Attachment 1*) and recently the Grand River/Novi Road Region-wide Traffic Impact Study (currently underway; *Attachment 2*).

2016 Thoroughfare Master Plan

In 2016, the Corradino Group of Michigan completed a thoroughfare master plan for the City that identified areas where congestion is anticipated in 2040 and made recommendations for improvements. Congestion is anticipated along Novi Road between 10 Mile Road and Twelve Oaks mall. The study recommends the following solutions to reduce the congestion:

- Widen Beck Road from 8 Mile Road to Grand River Avenue
- Widen Beck Road from 12 Mile Road to Pontiac Trail
- Provide a transit circulator between the Twelve Oaks Mall area and Town Center Area

Novi Road Corridor Traffic Operations and Potential Improvements Study

The concurrent planning for development of numerous parcels in the vicinity of the Grand River Avenue and Novi Road intersection led the City to undergo an in-depth traffic study to consider the impacts of the developments collectively, rather than through individual studies. The study includes 15 developments in the general area and analyzes conditions at 11 signalized and 5 unsignalized intersections under existing and future conditions. One key factor that was studied is known as level-of-service (LOS). LOS is a qualitative rating ranging from A to F which measures traffic factors such as speed, travel time and safety.

Under existing (2018) conditions, the intersections of Novi Road and Grand River Avenue, the I-96 westbound off-ramp, and West Oak Drive South had overall and/or individual turning movements operating with levels of service less than D. These findings

indicate the current need for additional capacity along Novi Road near the I-96 interchange, including the potential for additional turn lanes at the Novi Road/Grand River Avenue intersection.

Under future (2028) conditions, additional turning movements are projected to operate with levels of service less than D at the following intersections:

- Novi Road and 10 Mile Road
- Novi Road and Main Street
- Novi Road and Bond/Flint Street
- Novi Road and Crescent Boulevard
- Novi Road and the I-96 eastbound off-ramp

AECOM and the RCOC are currently working in collaboration to mitigate some of the traffic congestion along this corridor via signal timing adjustments.

Currently, the traffic volume along Novi Road exceeds its capacity during the peak travel periods which leads to a poor LOS. Additionally, there are some turning movements that experience long queues and increased delays. To mitigate some of these concerns, the study recommends mitigation opportunities such as:

- Traffic signal timing and phasing adjustments;
- The connection of the northwest ring road, Crescent Blvd, from Novi Road to Grand River;
- The connection of the southwest ring road, Flint/Bond Street, between Novi Road and Grand River;
- The construction of Taft Road over the I-96 Expressway to create a connection between Grand River and Twelve Mile Road;
- A potential connection of Fountain Walk Avenue to the west to Twelve Mile Road;
- Considering additional transit connections to serve other areas of the city beyond the Twelve Oaks and Town Center areas.

Ten Mile Road Scoping Study

The City is currently working with their Engineering Consultant, OHM Advisors to study the Ten Mile Road Corridor from Napier Road to Haggerty Road to identify opportunities for additional capacity and improved operations. The results of this study are not available at this time but may have an impact on the Novi Road corridor traffic operations.

Engineering Solutions

The City's Engineering Division has been working diligently to plan for and implement several of the recommendations from the 2016 Thoroughfare Master Plan, especially safety-related improvements. Particular to the Novi Road corridor, safety-related improvements that have been incorporated include enhanced crosswalks at the intersection of Novi Road and Grand River, and LED street lighting upgrades. The City also maintains close coordination with AECOM and RCOC regarding on-going and recommended improvements along the Novi Road corridor. Recent Novi Road corridor-related initiatives include the following:

- **Novi Road and Crescent Blvd**: installed right-turn green arrows for the westbound approach to enable more optimal use of the signal timing.
- **Novi Road and Twelve Oaks/West Oaks**: adjusted the signal phasing to alleviate some of the non-compliant, safety-related issues that have been occurring at the intersection.
- AECOM is working in collaboration with the RCOC to review and refine timings along Novi Road. The timing adjustments may provide slight improvements in traffic operations but are not expected to improve LOS significantly across the corridor.
- The City and RCOC are in communication with the Michigan Department of Transportation (MDOT) regarding future plans to modernize or incorporate traffic signal timing adjustments at the I-96 and Novi Road intersection.
- The City of Novi has already prepared construction plans for the northwest ring road connection of Crescent Blvd between Novi Road and Grand River.
- The City of Novi and AECOM are currently designing the southwest ring road connection of Flint/Bond Street between Novi Road and Grand River.

The City will work with AECOM to review the recommendations and define a plan to incorporate the applicable measures into the City's Capital Improvement Program (CIP). The City's recent attention to the Novi Road corridor is a valuable step in addressing the City Council long-term goals to relieve traffic congestion along the Novi Road Corridor from 10 Mile Road to Twelve Oaks Mall. Continued coordination with AECOM, RCOC and MDOT to develop and implement strategies is expected to further enhance traffic operations.

Please let me know if you have any questions or comments regarding this memorandum.

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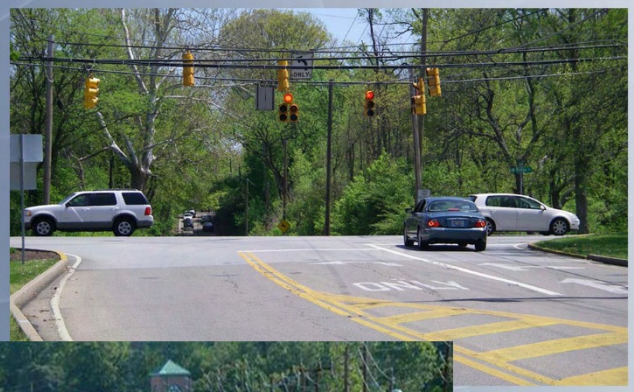
CITY OF NOVI THOROUGHFARE MASTER PLAN



DRAFT FINAL REPORT

June, 2016

Submitted by:

THE CORRADINO GROUP
Engineers • Planners • Program Managers • Environmental Scientists

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Summary

The leaders and citizens of Novi understand that the purpose of a truly multi-modal thoroughfare master plan is to establish physical and cultural environments that support and encourage safe, comfortable, and convenient travel by a variety of modes.

They understand that a broad constituency must be engaged in the planning process, including elected and agency officials, neighborhood and business leaders, and, most important, the general public. A Thoroughfare Master Plan (TMP) must give form to their vision and provide a consensus on how to move the plan forward to fruition.

Long-range planning is driven by a number of factors: local growth and land use changes; the Michigan Department of Transportation (MDOT) need to maintain its Trunkline system; the Road Commission for Oakland County (RCOC) need to manage county roads; available funding; and, the planning process of the Southeast Michigan Council of Governments (SEMCOG), which integrates these considerations with the needs of its members, including the City of Novi.

This requires the integration of projects among transportation modes to form a plan that complements the Master Plan for Land Use, and is also forward-thinking. To assist in preparing the TMP, Novi has engaged The Corradino Group of Michigan consulting firm (Corradino).

Throughout the project, input was received through the web-based application known as *Community Remarks*, the results of which are included in a separate Public Involvement Diary. Each public comment received a response. The categories of "Safety and Traffic Calming," "Intersection Improvements," and "Pedestrian Improvements" received more than 75% of the comments. Other comments were divided among "Roadway Improvements" (ten comments), "Bicycle Improvements" (three comments), and "Transit" (two comments). In all, *Community Remarks* receive over 2000 "hits" by people visiting the site.

Over the course of the project, four public meetings were conducted. All but the February, 2016, meeting was preceded by a Novi Planning Commission meeting. Notes of each meeting are included in the *Public Information Diary*.

At the December, 2015, and February, 2016, meetings, those in attendance were asked, using a touch-pad polling system known as *Turning Point,* to provide their opinion on eight topics. In summary, the results, indicate the meeting attendees were older adults and drove fewer than ten minutes in the off-peak hours to volunteer or work. None biked or walked on a regular basis, for a variety of reasons. Oddly though, when asked about the most important items that would enhance Novi's transportation system, improvements to streets/sidewalks, biking facilities, and traffic signal timing were cited in almost equal amounts (20% to 25%) as the most preferred; roadway widening was preferred by fewer than 10% of the respondents. These independent opinions closely align with the comments received through the *Community Remarks* application.

Recommendations

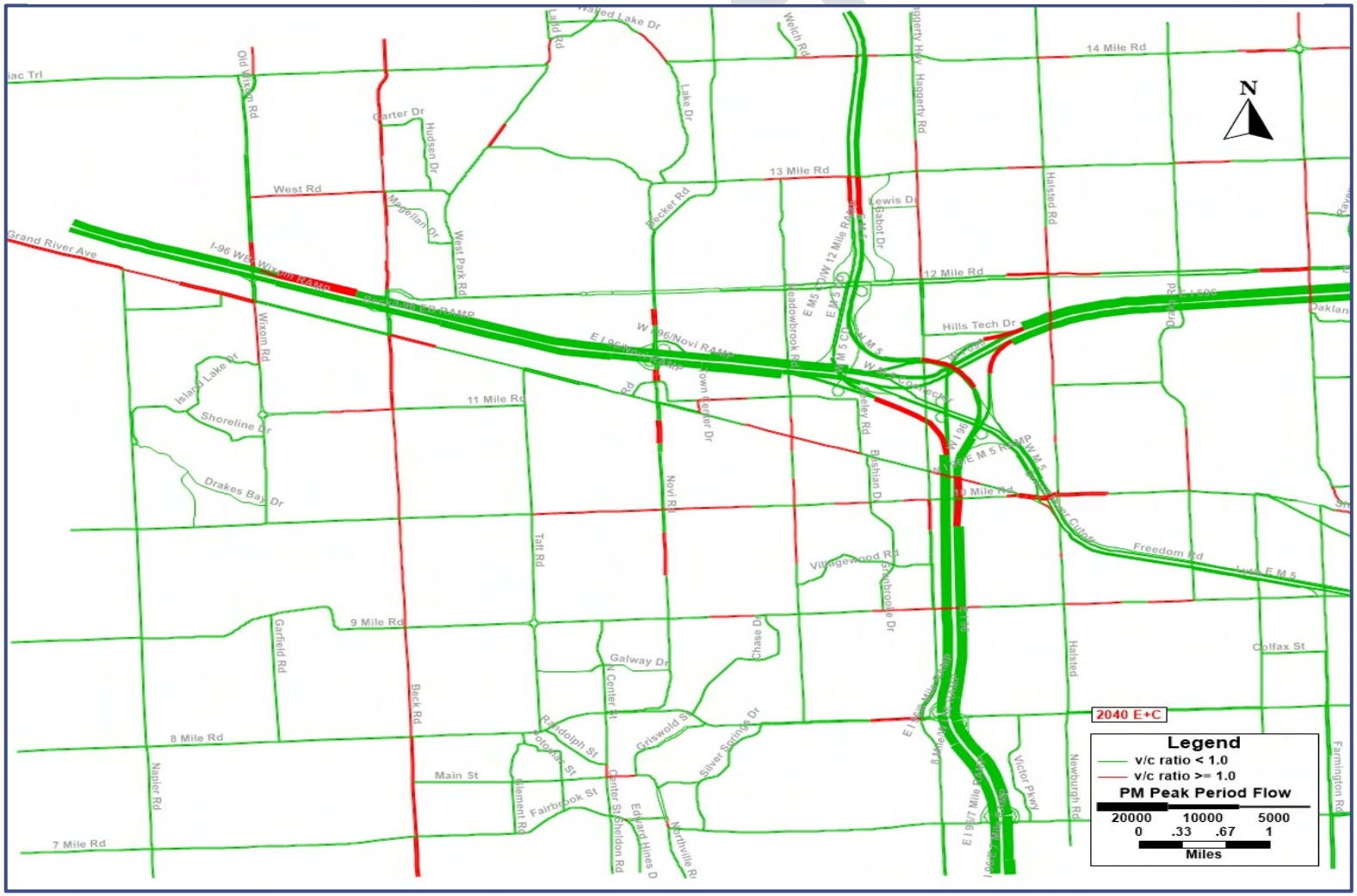
Roads

A central task to successfully execute this project is predicting traffic in the year 2040. To do so, Corradino developed daily and PM peak period (3-6 pm) travel forecasting models. The 2015 Base Model was developed consistent with modeling of the *2011 Novi and Wixom Transportation Plan* prepared by Corradino. Additional information included SEMCOG model files and the latest traffic data provided by the RCOC, MDOT, and the Traffic Improvement Association of Michigan.

Multi-modal transportation elements were examined in layers, beginning with the most costly-to-implement element – roads. Analysis of future traffic conditions are illustrated in Figure S-1 which shows the 2040 volume/capacity (V/C) ratios in the PM peak period. In this graphic, RED indicates the V/C ratio exceeds 1.00, reflecting significant congestion. GREEN indicates significant congestion is

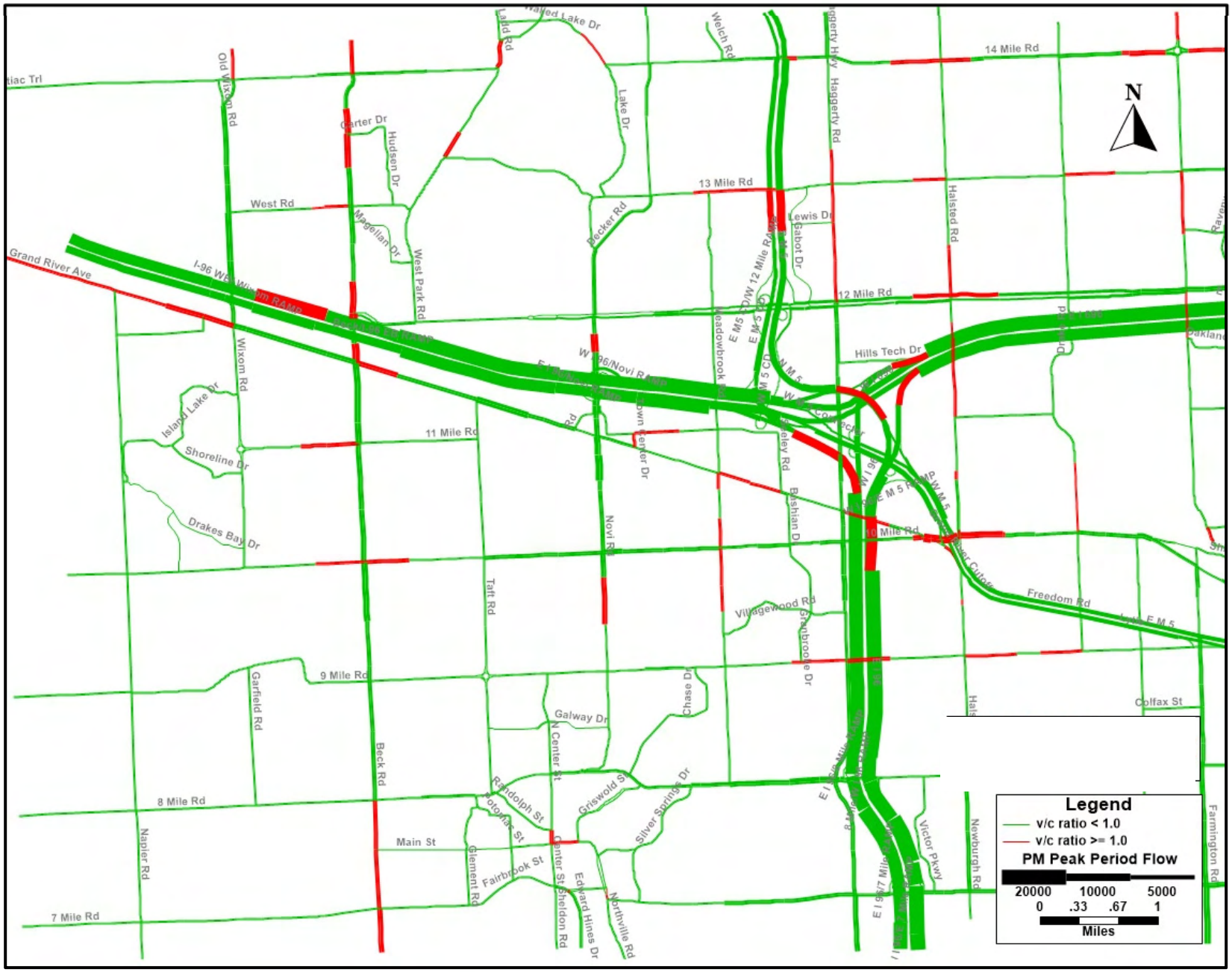
not detected by the model. To determine the potential positive impact on congestion, a series of tests was executed. The most cost-effective alternative combines widening Beck Road from 8 Mile Road to Pontiac Trail and 10 Mile Road from Haggerty to Taft. Funding, impact and policy constraints prevent more road widenings in the near future. It is noted that widening Beck and 10 Mile Roads does not address all the congestion expected in 2040, as evidenced by the red/congested paths on Figure S-2. Proposed improvements at the intersections circled on Figure S-3 will also address congestion.

Figure S-1. 2040 E+C PM Peak Period Traffic Condition



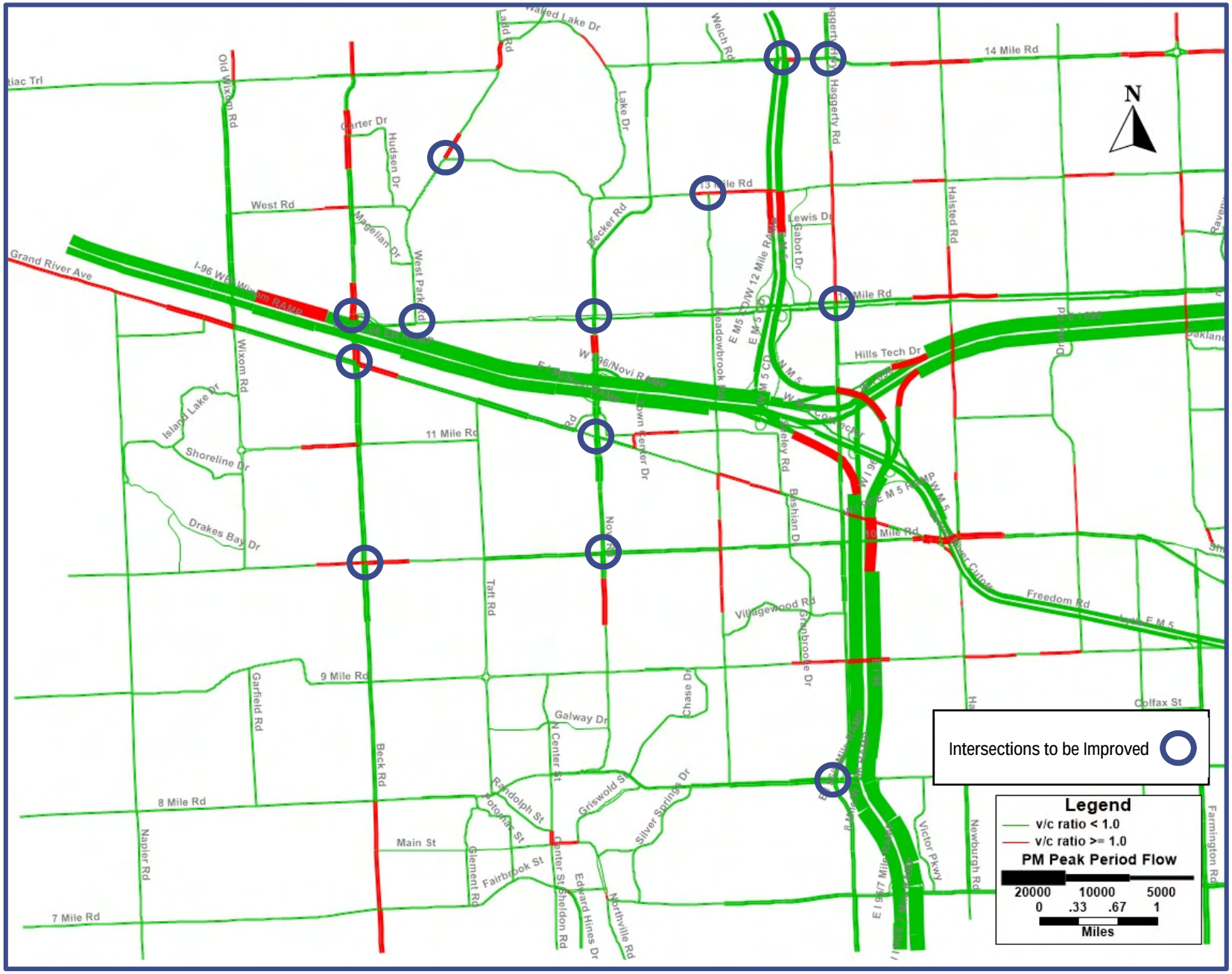
Source: The Corradino Group of Michigan, Inc.

Figure S-2. 2040 E+C PM Peak Period Traffic with Widened Beck and 10 Mile Roads



Source: The Corradino Group of Michigan, Inc.

Figure S-3. Novi Intersections Proposed to be Improved



Source: The Corradino Group of Michigan, Inc.

Intersections

For the Thoroughfare Master Plan, Corradino used an approach that examines crash rates per million vehicles entering an intersection. Additionally, a *Severity Index* was calculated for each intersection.

Corradino determined the candidate intersections for crash countermeasures are:

1. Beck Road at 10 Mile Road;
2. Beck Road at Grand River Avenue
3. Beck Road at I-96 ramps;
4. Novi Road at Grand River Avenue;
5. 8 Mile Road at Haggerty Road;
6. Novi Road at 10 Mile Road;
7. 12 Mile Road at Novi Road;
8. 12 Mile Road at Haggerty Road;
9. 12 Mile at West Park Drive;
10. 14 Mile Road at M5;
11. 14 Mile Road at Haggerty Road;
12. Meadowbrook at 13 Mile Road; and,
13. West Park Drive at South Lake Drive

All but the last two intersections are under MDOT or RCOC control. Intersections #13 and #14 are under the control of the City of Novi.

Details of the proposed improvements at these locations are covered in Section 7.2 of this report.

Non-Motorized

Novi's current top priority pathway/sidewalk projects, as listed in the *Annual Non-Motorized Prioritization 2015-16 Update,* are shown on Table S-1.

Table S-1. Table 4A from Annual Non-Motorized Prioritization 2015-16 Update

Annual Non-Motorized Prioritization: 2015-2016 Update

Table 4A:
2015-16 Top 20 Priority Pathway and Sidewalk Segments excluding deferred segments
City of Novi

Overall Segment Rank	Segment Item #	Section #	Type	Side of Street	Location	From	To	# of Pieces in Segment	Segment Length (ft.) excluding Developer Planned & Completed Pieces	Notes
1	81B		P	south	**Ten Mile**	Willowbrook	Haggerty	1	2,750	17-18 & 19/20 CIP
2	81A	25	P	south	**Ten Mile**	Meadowbrook	Willowbrook	1	2,530	17-18 & 19/20 CIP
3	9B	4	S	south	**Pontiac Trail**	Wedgewood	West Park	2	2,560	16-17 & 17-18 CIP
5	120A	36	S	west	**Haggerty**	Eight Mile	N of Orchard Hill	2	1,390	
6	9A	4	S	south	**Pontiac Trail**	Beck	Wedgewood	1	2,440	16-17 & 17-18 CIP
7	62	22	S	north	**Ten Mile**	Eaton Center	Churchill Crossing	1	400	15-16 CIP
8	39	17	P	west	**Beck**	Eleven Mile	Providence	1	1,100	17-18 CIP
9	93B	27	S	north	**Nine Mile**	Plaisance	Taft	2	650	
11	90	26	P	south	**Ten Mile**	Novi Rd.	Chipmunk	1	2,400	18-19 CIP
11	119c	36	S	east	**Meadowbrook**	Eight Mile	N of Llewelyn	1	1,200	18-19 CIP
13	84B	25	S	east	**Meadowbrook**	Nine Mile	Chattman	1	2,050	19-20 CIP
14	119B	36	S	east	**Meadowbrook**	Singh Blvd	N of Llewelyn	1	1,300	18-19 CIP
15	93A	27	S	north	**Nine Mile**	Novi Rd.	Plaisance	1	2,650	
16	70	23	P	west	**Meadowbrook**	Eleven Mile	Gateway Village	3	900	
17	99A	29	P	south	**Ten Mile**	Wixom	400' E of Lynwood	1	2,900	17-18 CIP
20	5	2	S	south	**Fourteen Mile**	Beachwalk Apartments	East Lake	1	600	19-20 CIP
21	119A	36	S	east	**Meadowbrook**	Nine Mile	Singh Blvd	1	1,300	18-19 CIP
22	84A	25	S	east	**Meadowbrook**	Ten Mile	Chattman	1	2,350	19-20 CIP
23	99B	29	P	south	**Ten Mile**	400' E of Lynwood	Beck	1	1,100	17-18 CIP
24	120B	36	S	west	**Haggerty**	Orchard Hill	High Pointe	1	375	
									32,945	

Legend S= 6 ft. sidewalk P= 8 ft. pathway

Segments with pathways or sidewalks on most of the opposite side of the street - *note that these segments may be critical for system connectivity & must be analyzed separately for connectivity*

Segments with a higher ranking segment planned for the opposite side of the street - *note that these segments may be critical for system connectivity & must be analyzed separately for connectivity*

Short Segments (400 ft. or less

Scheduled Segment

CIP Budget Year

Source: Annual Non-Motorized Prioritization 2015-16 Update

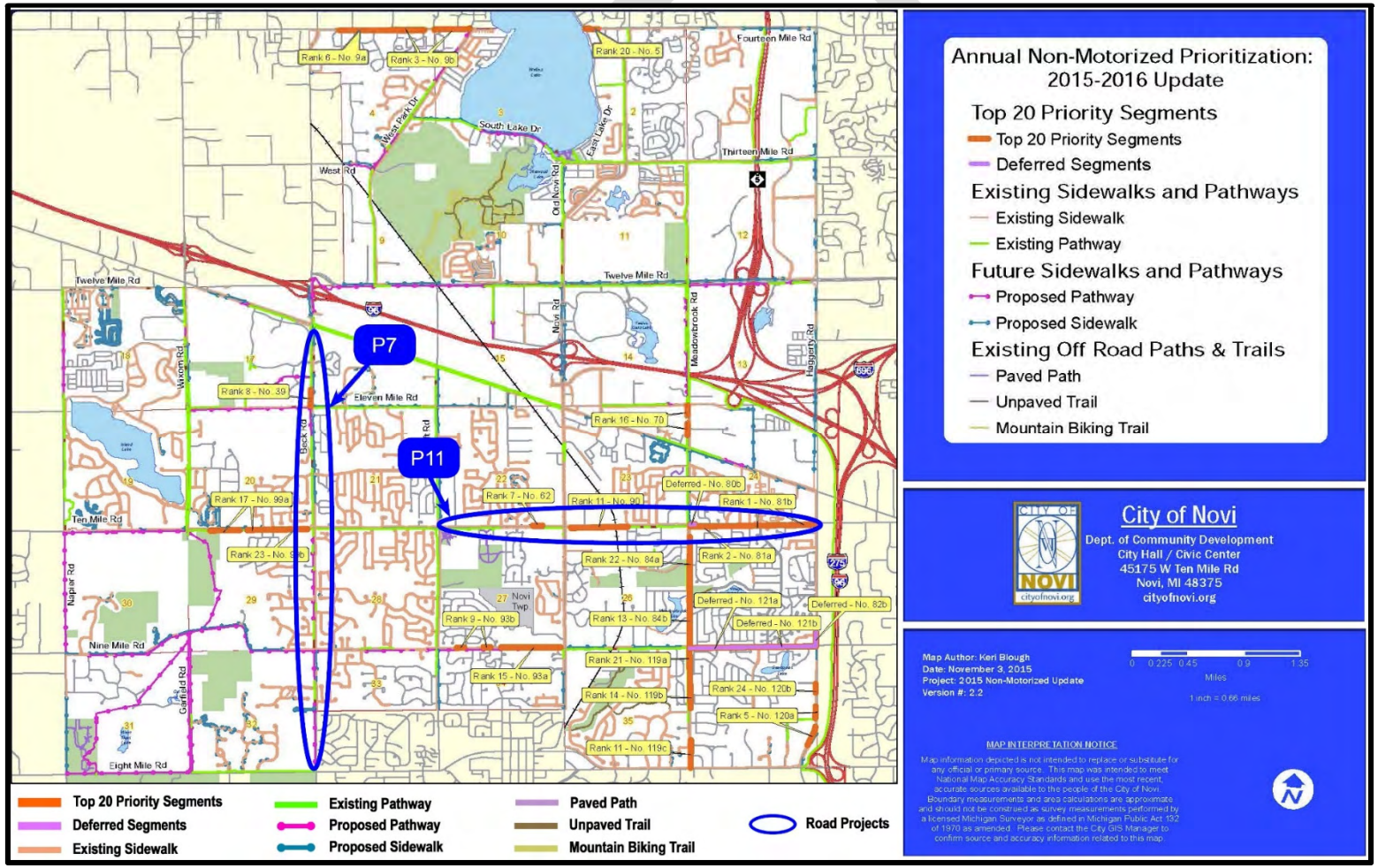
Four of these would be constructed when Beck Road, between 8 Mile Road and Grand River Avenue, and 10 Mile Road, between Taft Road and Haggerty Road are widened (Table S-1 and Figure S-4). Other non-motorized projects will be implemented as part of Novi's Annual Non-Motorized Projects Prioritization Update.

Table S-2. 2015–16 Top 20 Priority Pathway/Sidewalk Segments Associated with Potential Road Widening Projects

Road Segment		Non-motorized Project	Non-motorized Length	Capital Improvement Program Yr.	Cost
P7	Beck Road – 8 Mile to Grand River	Rank 8 – No. 39, west side	1,100'	2017–2018	$155,000
P11	10 Mile – Taft to Haggerty	Rank 1 – No. 81b, south side Rank 7 – No. 62, north side Rank 11 – No. 90, south side	2,750' 400' 2,400'	2017–2018 & 2019–2020 2015–2016 2018–2019	$775,000

Source: The Corradino Group of Michigan, Inc.

Figure S-4. Proposed Thoroughfare Road Improvement Projects Superimposed on 2015–16 Top Priority Pathway and Sidewalk Segments Map



Source: City of Novi, Michigan, and The Corradino Group of Michigan, Inc.

Transit

Regional Transit

The Regional Transit Authority (RTA) of Southeast Michigan, created in 2012, is responsible for planning and coordinating transit within Washtenaw, Oakland, Wayne, and Macomb counties, including that provided by the Suburban Mobility Authority for Regional Transportation (SMART). In November, 2016, there will be a referendum in the four-county region that, if successful, would fund regional transit through the RTA. The referendum will be a regional yes or no vote; there can be no "opt out" for individual cities or counties. Currently, SMART routes do not extend into Novi, as the city has opted out of the millage that underwrites service, SMART does provide some funding of Novi's Older Adults transportation program.

RTA has proposed a Regional Master Transit Plan to guide transit developments in Southeast Michigan over the next 20 years.

RTA's Master Transit Plan indicates Novi has an "emerging" transit demand. It offers a number of ways to serve it (Figure S-5):

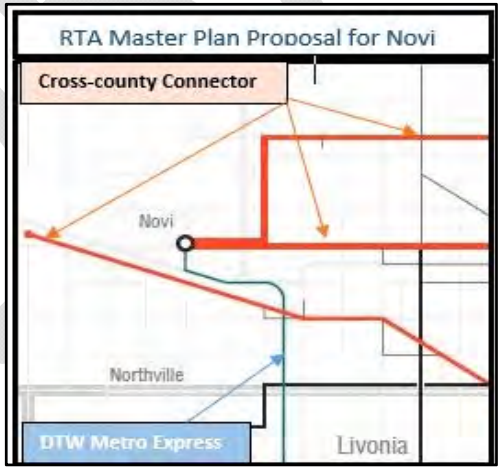
- Premium service, such as express bus routes to the Detroit-Wayne County Airport (DTW);
- Cross-county service; and,
- Demand-responsive service, like Novi's Older Adults transportation program.

To examine the potential cost of a regional transit approach in the Novi TMP, a logical starting point was to extend existing SMART bus routes that today serve communities to the east. The current westernmost limit of these routes is Haggerty Road (Figure S-6). Routes 330 and 740 could be extended farther to the west into Novi. Route 780 could extend south from Maple Road along Haggerty Road.

If Route 330 were extended, it could serve the many attractions along Grand River Avenue, terminating at the Providence Park Hospital campus. Routes 740 and 780 could follow a common path west along 12 Mile Road to serve the Twelve Oaks Mall. These proposals reflect the Regional Master Plan for Novi (Figure S-7).

Annual costs to extend all these SMART routes, on the basis for the existing number of scheduled runs and using SMART's cost per mile and per hour, could be almost $15 million (Table S-3). If limited weekday service were provided (two inbound trips in the morning and two outbound in the evening), the cost could be near $2.5 million.

Figure S-5. RTA Master Plan Proposal



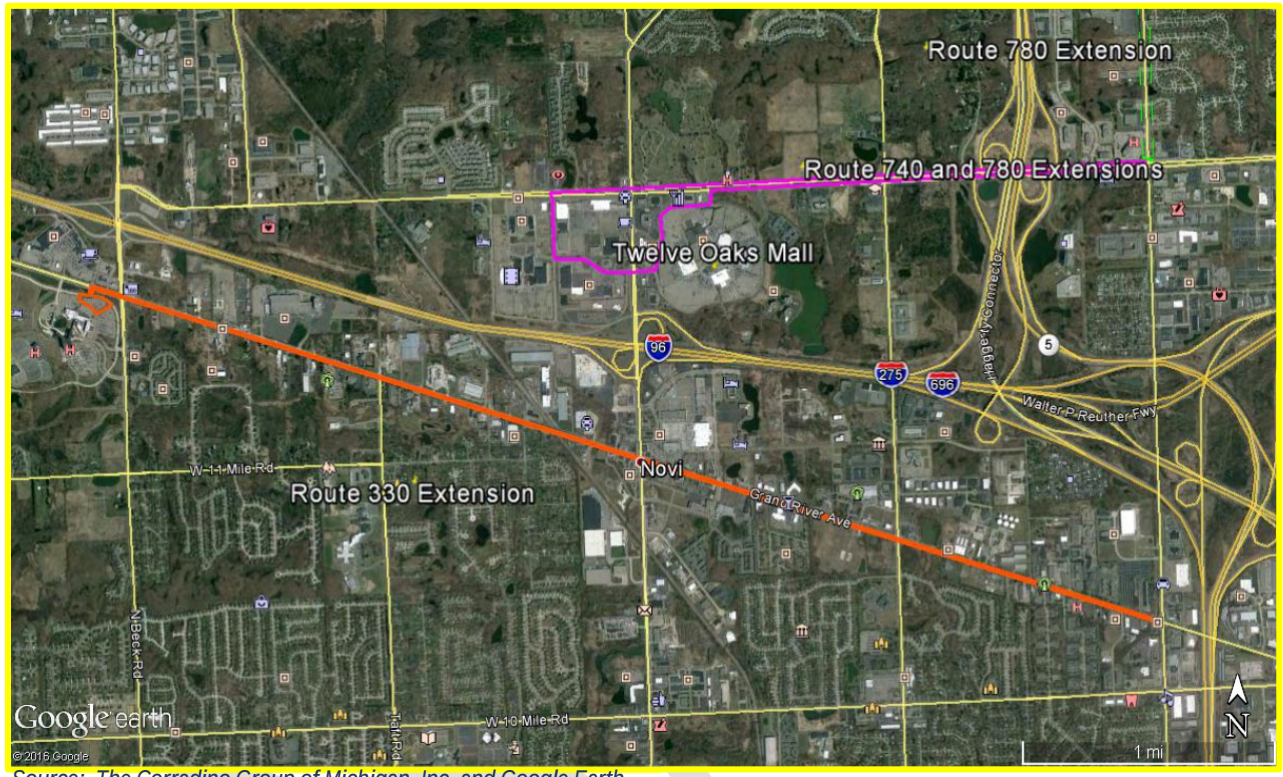
Source: SMART

Figure S-6. Current SMART Bus Service near Novi

Source: SMART

In reviewing these services with the TMP Steering Committee, there was concern about Novi bearing this expense, unless the regional transit millage passes. If the 1.2 mils in additional property taxes is approved in the regional vote, the City of Novi would contribute approximately $3.8 million per year. By legislative mandate, no county can receive transit services which cost less than 85% of what it contributes in taxes. If this provision applies to cities, it appears regional transit is in Novi's future. There is a caveat: It is a formula unique to Oakland County and does not imply an 85% contribution to the City of Novi although it does look like the proposed services will be extensive for Novi.

Figure S-7. Example Extensions of SMART Routes 330, 740, and 780



Source: The Corradino Group of Michigan, Inc. and Google Earth

Table S-3. Potential Costs to Extend SMART Routes 330, 740, and 780 in Novi

	Extension in Miles	Cost/Mile*	Cost/Run	Runs/Wkday	Runs/Sat	Runs/Sun	Yearly Runs	Annual Cost
Full Service								
Extension of Route 330	9.4	$100	$940	19	14	0	5668	$5,327,920
Extension of Route 740	5.3	$ 100	$530	18	15	12	6084	$3,224,520
Extension of Route 780	9.2	$100	$920	20	17	13	6760	$6,219,200
Limited Service								
Extension of Route 330	9.4	$100	$940	4	0	0	1040	$977,600
Extension of Route 740	5.3	$100	$530	4	0	0	1040	$551,200
Extension of Route 780	9.2	$100	$920	4	0	0	1040	$956,800

**Operating Expense per Hour as reported to MDOT for 2014.*

Source: The Corradino Group of Michigan, Inc.

Older Adult Services Transportation

The City of Novi Older Adult Services Transportation (OAST) provides specialized transportation for Novi residents age 55+ and those under 55 with a limiting disability. Service is to medical appointments, shopping, special events, classes, etc. The program operates Monday through Friday from 8am–5pm and Saturday between 9am and 3pm; there are no Sunday operations. Reservations are required at least two days in advance and trips are scheduled based on availability. In FY 2014/2015, OAST provided 12,034 one-way rides (including those for special events) using seven vehicles. Passengers may travel anywhere within the City of Novi for $3 per one-way ride and $5 per one-way ride for trips outside the city but within ten miles from the Novi Civic Center. There are complimentary rides to the Meadowbrook Activity Center, the Civic Center, Novi's Public Library, or to a City of Novi special events or programs within the city limits.

The OAST current annual budget of about $160,000 is supported by fare box revenues ($30,000), the City of Novi General Fund ($25,000), the Parks, Recreation & Cultural Fund ($27,000), SMART ($54,450), program donations ($20,000), and advertising ($2,400), The TMP expects the service to continue in its current form which costs about $160,000 per year. Passage of the RTA plan may provide funds to cover these costs.

Funding Source	Amount	% of Funding
Fare Box	$30,000	19%
Novi General Fund	$25,000	16%
Parks, Recreation	$26,916	17%
SMART	$54,454	34%
Donations	$20,000	12%
Advertising	$2,400	2%
TOTAL	*$158,770*	*100%*

Source: City of Novi, Michigan

Transit Circulator

A circulator between the Twelve Oaks Mall area and Town Center area was analyzed for service on Saturdays and recommended as a six-month "trial" project. The estimated cost is $45,000. The vehicles would be those of the OAST available for six hours on Saturdays. If the service proves successful, additional hours may be beneficial, which may require additional equipment.

Circulator Bus

Future Possibilities

Autonomous (self-driving) vehicles are the future of transportation around the world. Traditional modes of transportation are being inundated with technology, and, as with everything else technology-driven, the future of transportation is evolving at a rapid pace. The limitations are, in fact, not the autonomous vehicles and technology, as much as the regulations to be put into place.

In that regard, federal regulators plan to issue guidance within months on preferred performance characteristics and testing methods for driverless vehicles and collaborate with state officials on policies. And, the federal government is considering spending $4 billion to encourage developing driverless vehicles.

While researchers began building autonomous vehicles that could be tested on public roads, the concept evolved into Connected Autonomous Vehicles (CAVs) which can communicate with each other, and communicate with infrastructure, much more efficiently and as fast as the human brain.

CAVs, once fully implemented, have the potential to improveour way of life. Among the numerous benefits are:

1. Improving safety by reducing the number of crashes that occur annually on our roadways; and,

2. Reducing:
   - traffic congestion;
   - speeding;
   - emissions/pollution;
   - impaired driving;

- texting-while driving; and,
- road rage.

In addition to these transportation system improvements, CAVs also have the potential to improve daily living, particularly for seniors and the disabled. Concerns like: *"How will I get to the grocery store or the doctor or just get out of the house because I can no longer safely operate a moving vehicle"* can be addressed.

To meet these needs today, there are the Older Adults Services transportation program, taxicabs, Uber, and Lyft. In the next several years, there will also be CAVs. Government support of this technology could be the catalyst for funding of a mass transit system that includes a fleet of CAVs. The federal government has been receptive and willing to embrace CAVs because of their social benefits. Providing an alternative to bus/van and other transit modes/vehicles will help encourage more government funding to make CAVs a reality for public use. Concern about loss of revenue from existing transportation systems is on the opposite side of this discussion. But, as explained in the article: *Autonomous vehicles will have tremendous impacts on government revenue*,[1] there is a potential for significant cost savings to governments compared to the loss of revenue.

Consider tha, t If you do not possess the ability to operate an auto, how transformative it could it be for a vehicle to come to you, on demand, and provide travel, with comfort, safety, and security?

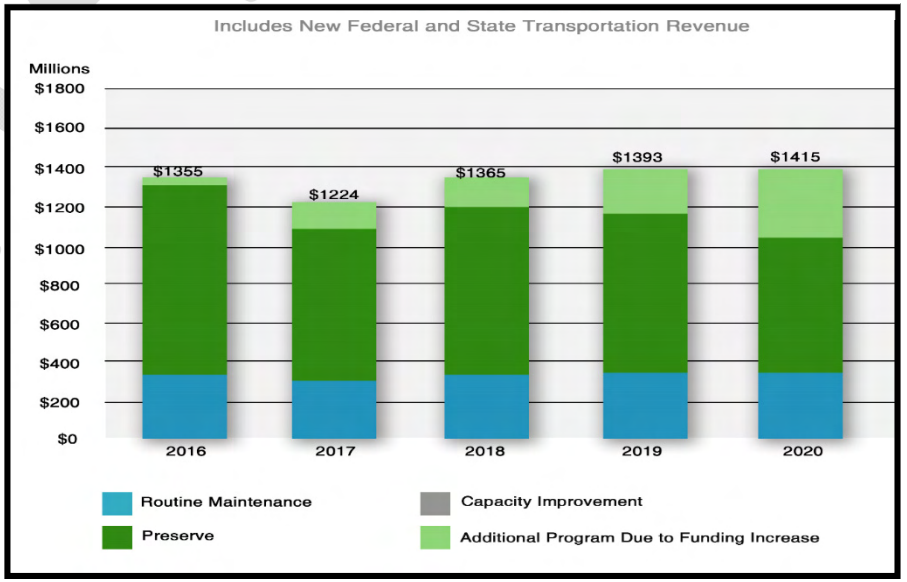
[1] Kevin C. Desouza, Nonresident Senior Fellow, Governance Studies, Center for Technology Innovation; Kena Fedorschak, MBA candidate, W.P. Carey School of Business, Arizona State University

Funding Situation

State and Federal Programs

After years of frustration at the federal and state levels, both governments enacted transportation funding legislation in 2015. The state program doesn't begin to provide monies until January 1, 2017; it then takes until fiscal year 2020 for the full effect (estimated to be $1.234 billion per year) to be felt. Those funds are to be distributed 696 ways: MDOT, 80 transit agencies, 83 counties, and 533 villages and cities. At the federal level, the FAST Act (Fixing America's Surface Transportation) will provide five years (FY 2016 through FY 2020) of funding certainty. For Michigan, that represents $1.02 billion in the first fiscal year and $1.17 billion in FY 2020. This is about $52 million (5.1%) of net new money in 2016 versus 2015 and, then, about $20 to $25 million (about 2.25%, on average) of net new money each year after. When combined with state funding, cities in Michigan can expect $66.4 million in FY 2017, when additional Michigan funding begins to flow. That will grow to $186 million in 2020. It must be kept in mind funding to local government will be divided 533 ways. Novi is the 27th largest city in Michigan with about 1% of the total city/village population. It is also important to recognize that these funds are to be allocated overwhelmingly to routine maintenance and preservation of existing roads. A relatively small amount will be available for projects that will increase capacity.

Michigan Highway Program Investment by Category, FY 2016 to 2020



Source: NTH Consultants, Ltd. Webinar Slides

Novi Funding

The City of Novi annually spends approximately $11.5 million on roadway capital improvements and another $3 million on maintenance. Novi's sidewalks/pathways program for the five fiscal years ending in FY 2020, totals $11.4 million, all but $733,000 to come from the Municipal Street or Major Road Funds. Phase II of the M5/I-275 Regional Trail Connection is the project for which $733,000 is needed from local/Novi funds. The Older Adults Services transportation program is supported by several sources, including non-government donations, advertising and fare revenue.

Implementation

Table S-4 provides a summary of the cost of each element of the multi-modal Thoroughfare Master Plan. The total road ($41.3 million) and intersection ($5.8 million) cost estimate is $47.1 million. Beck Road widening is phased over FY 2017-2021 while expanding 10 Mile Road is phased between FY 2021-2025. Intersection improvements are programmed to occur between 2016 and 2020. The 11 sidewalk and pathway projects that are part of the plan are programmed to be built in the period FY 2016-2022 at a cost of $4.3 million. In addition to continuing the Older Adults transportation program, and a $45,000 "trial" mall circulator, major transit developments appear to be dependent on the Regional Transportation Authority's multi-county referendum of November, 2016.

Table S-4. Novi Thoroughfare Master Plan Recommendations

Widening/Capacity Improvement		Estimated Cost[1]	Implementation Period
Beck Road	8 Mile Road to Grand River Avenue	$21.5 million	FY 2017–2021
–Segment A	–8 Mile Road to 9 Mile Road	$6.3 million	FY 2017–2018
–Segment B	–9 Mile Road to 10 Mile Road	$5.6 million	FY 2018–2019
–Segment C	–10 Mile Road to 11 Mile Road	$6.3 million	FY 2019–2020
–Segment D	–11 Mile Road to Grand River Avenue	$3.3 million	FY 2020–2021
10 Mile Road	Haggerty Road to Taft Road	$19.8 million	FY 2021–2025
Meadowbrook Road	10 Mile Road to 12 Mile Road	TBD	After 2025
Grand River Avenue	Novi Road to Haggerty Road	TBD	After 2025
Novi Road	9 Mile Road to 10 Mile Road	TBD	After 2025

Intersection Improvements	Estimated Cost	Time Frame
Beck Road at 10 Mile Road	$750,000	See footnote 2
Beck Road at I-96 Ramps	$300,000	See footnote 2
Beck Road at Grand River Avenue	$750,000	In progress
West Park Drive at 12 Mile Road	$215,000	FY 2019–20
West Park Drive at South Lake Drive	$175,000	FY 2019–20
Novi Road at 10 Mile Road	$75,000	FY 2018–19
Novi Road at Grand River Avenue	$3,250,000	FY 2018–19
Novi Road at 12 Mile Road	$10,000	FY 2018–19
Meadowbrook at 13 Mile Road	$200,000	FY 2018–19
Haggerty Road 8 Mile Road	$5,000	FY 2016–17
Haggerty Road at 12 Mile Road	$35,000	FY 2016–17
Haggerty Road at 14 Mile Road	$40,000	FY 2016–17
M5 at 14 Mile Road	$3,000	FY 2016–17

Sidewalks and Pathways	Segment	Estimated Cost	Time Frame
South side of 10 Mile Road	Meadowbrook to Haggerty	$745,000	FY 2019–22
South side of Pontiac Trail	Beck to West park	$490,000	FY 2017–19
West side of Haggerty Road	8 Mile to High Pointe	$295,000	FY 2019–20
North side of 10 Mile road	Eaton Center to Churchill Crossing	$175,000	FY 2018–19
West side of Beck Road	11 Mile to Providence	$185,000	FY 2018–19
North side of 9 Mile Road	Novi Road to Taft	$415,000	FY 2018–21
South side of 10 Mile Road	Novi Road to Chipmunk Trail	$345,000	FY 2019–20
East side of Meadowbrook Road	8 Mile to 9 Mile	$490,000	FY 2019–22
East side of Meadowbrook Road	9 Mile to 10 Mile	$615,000	FY 2019–22
West side of Meadowbrook Road	11 Mile to Gateway Village	$450,000	FY 2019–20
South side of 14 Mile Road	Beach Walk to East Lake	$95,000	FY 2016–17

Transit	Service	Estimated Cost	Time Frame
Older Adult Services Transportation	Continuation of Current Service	$160,000/year	Ongoing
Novi Mall Circulator	Six-month demonstration	$45,000	FY 2017

[1] *2016 dollars*

[2] *To be coordinated with widening Beck Road*

Source: The Corradino Group of Michigan, Inc.

1. Introduction

Novi is one of the fastest growing cities in Michigan. The construction of Twelve Oaks Mall in the 1970s made the city a major destination in the Detroit metropolitan area and is often credited with ushering in an era of growth that lasted for 40 years (although, in fact, the community had been growing rapidly since the 1950s). This growth has led to substantial increases in the city's population, as well as commercial and industrial developments. Novi was ranked #48 on Money magazine's list of the *Top 100 Best Places to Live* in 2008.

Historical population		
Census	Pop.	%±
1970	9,668	—
1980	22,525	133.00%
1990	32,998	46.50%
2000	47,386	43.60%
2010	55,224	16.50%
Est. 2014	58,416	5.80%
U.S. Decennial Census		

Economy: Novi has a local economy that includes businesses of all sizes from international corporations with local and regional offices to owner-operated businesses serving the local area. While Novi is recognized for its concentration of retail businesses clustered at the Novi Road/I-96 interchange, there are several large retail centers in the city as well as many individual retail businesses. The city's industrial and office parks are home to companies in high-tech research and development, health care, transportation and logistics, manufacturing and supplying domestic and foreign automotive equipment. Google recently announced it will locate a self-driving technology center in Novi in the Beck West Corporate Park, off Beck Road. The Japan Auto Parts Industries Association of North America has its offices in Novi. Toyota Boshoku America has more than 200 employees in the city. Energy-related companies are one of the fastest growing sectors in the city. These include ITC Transmission, Novi Energy and Patrick Energy Services. Kroger has its Michigan-region headquarters in Novi.

Economic Growth: Over the last few years, Novi has focused its economic development efforts on the telematics and car connectivity industries. In telematics, approximately 70,000 people are employed in Oakland County, many of them are in Novi. Novi firms include Cooper-Standard Automotive, Freescale Semiconductor, Elektrobit, and Harman/Becker Automotive.

Novi's Neighborhoods and Business Relations Group attracts and retains businesses. It has streamlined many of its planning and approvals processes to encourage new business. The enhancements speed the process, allowing businesses to move ahead with plans for relocation or expansion.

Novi attracted several smaller, innovative international firms that have expanded into a larger facility, such as Howa USA Holdings, a Japanese auto supplier with a new research and development center in Novi specializing in interior components for vehicles.

Ryder System, Inc. constructed a new regional headquarters, representing a $22 million investment in the community. ITC Transmission Company, the nation's largest independent electrical transmission company, made Novi its national headquarters. St. John Providence Park has a 200-bed hospital on a 200-acre campus. In addition to the full-service hospital, the campus provides an array of services in a wooded setting, complete with walking and cycling paths and 18 acres devoted to health-related retail establishments.

All indications point to continued growth and development in Novi. So, with a dynamic future, developing a Thoroughfare Master Plan, to complement the Land Use Master Plan, is timely.

1.1 Thoroughfare Master Plan

The leaders and citizens of Novi understand that the purpose of a truly multi-modal thoroughfare master plan is to establish physical and cultural environments that support and encourage safe, comfortable, and convenient travel by a variety of modes.

They understand that a broad constituency must be engaged in the planning process, including elected and agency officials, neighborhood and business leaders and, most important, the general public. A Thoroughfare Master Plan (TMP) must give form to their vision and provide a consensus on how to move the plan forward.

The overarching goal of the Novi Thoroughfare Master Plan is to protect and enhance the quality

of life in Novi. The following guiding principles will help achieve that goal:

- Provide an efficient, safe, and connected transportation system that is coordinated with existing and projected needs and takes into consideration future growth;
- Provide a transportation system that is economical and responsive to land use and non-motorized principles; and,
- Promote interconnectivity between development plans and the existing and future roadway networks.

In creating the Novi plan, an emphasis has been placed on improved connectivity to lessen the traffic burden on collector and arterial roadways. Expanding the sidewalks/pathways system will also assist in reducing vehicular traffic. Likewise, ensuring transit has an appropriate role, particularly serving the elderly, is essential to building a truly multi-modal system.

Foundation of Multi-Modal Plan

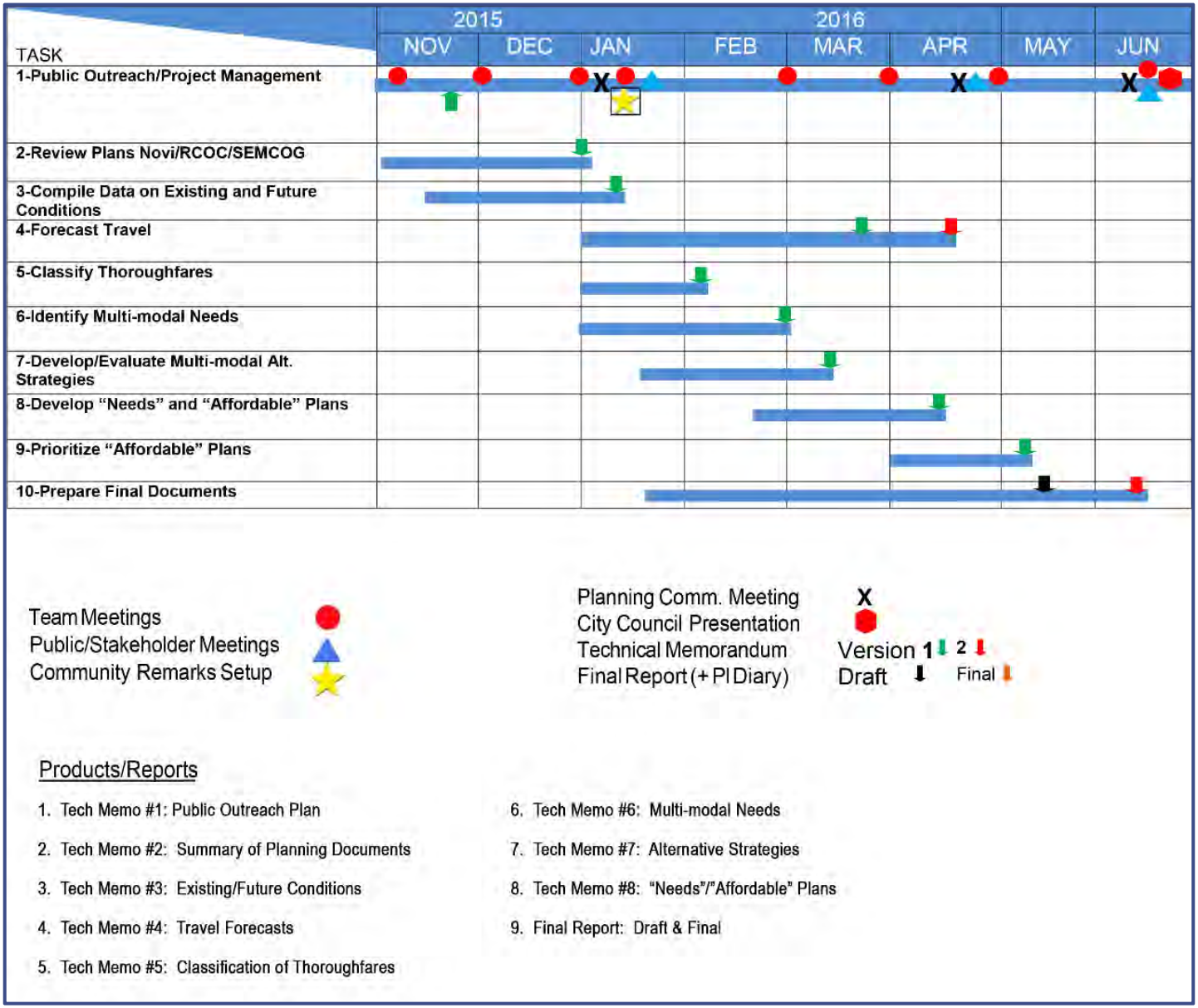
Long-range planning is driven by a number of factors: local growth and land use changes; the Michigan Department of Transportation (MDOT) need to maintain its Trunkline system; the Road Commission for Oakland County (RCOC) need to manage county roads; available funding; and, the planning process of the Southeast Michigan Council of Governments (SEMCOG), which integrates these considerations with the needs of its members, including the City of Novi.

This project requires the integration of projects among transportation modes to form a plan that complements the Master Plan for Land Use, and is also forward-thinking. To assist in preparing the TMP, Novi has engaged The Corradino Group of Michigan consulting firm (Corradino).

1.2 Schedule

The TMP was conducted in 2015-2016 (Figure 1). Three public meetings were conducted – in December, 2015, to introduce the project; in April, 2016, to present the preliminary plan; and, in June, 2016, to present the contents of the Final Report. A mid-day meeting was added in February, 2016, in cooperation with Novi's Older Adult Services. Three meetings were held with the Planning Commission, each preceding a public meeting so the Planning Commission could review/comment on the material to be presented to the citizens of Novi.

Figure 1. Schedule



2. Reports Summaries

The first task in this study involved thorough the review of a number of recent, relevant reports. Summaries of each report listed in Table 1 are included in Tech Memo #2, to which the reader is referred. It is available, as are all other tech memos, on the City of Novi Website under "City Services and Community Development." This location may change in the future.

Table 1. Background Documents

	REPORT	RECOMMENDATIONS	RESULT
1.	Beck — 8 Mile to Grand River Scoping Study, 2006	Short- and long-term rehab and capacity recommendations, with ultimate widening to five lanes	Some turn lanes have been added; no milling/rehab has been done. Rehab between 8 Mile and 9 Mile is scheduled for 2017. Rehab between 9 Mile and White Pine was completed in 2014.
2.	13 Mile/Old Novi/South Lake Intersection Study, 2009	Replace the signal with a stop sign and make geometric improvements, including those for pedestrians.	Complete
3.	Draft South Lake Drive Traffic Calming, September 2015	Install transverse pavement markings, possibly "speed kidneys," address the fact that there is a bike path in only one direction which is used mostly by pedestrians	No action, but the study was just recently completed.
4a.	NW Ring Road Study, June 2007	Updated earlier work on how best to extend Crescent Blvd. west and south to Grand Blvd. (Ring Road)	The City has the right-of-way, but nothing has happened since the planning study.
4b.	11 Mile and Town Center Area Walmart Traffic Impacts Report, 2012	Make signal, signage, and minor geometric changes	Some improvements are complete
4c.	Town Center Study, March 2014	Land use, zoning, design guidelines, and wayfinding	Ongoing zoning and design guideline actions.
4d.	Flint Street Improvement Study, January 2015	Extend the ring road concept south of Grand Blvd via Flint Street to Novi Road listing alternatives, costs and environmental considerations	No action, but the study was just recently completed.
5.	Speed Limit Study of Novi Road 12 to 14 Mile, 2010	Set speed limit to 45 mph; ask the School District Superintendent to request a speed zone, and install advisory 35 mph signing at curves	Speed limits were implemented.
6.	Transportation Improvement Plan, I 96/I-696/I-275 in Novi and Wixom	Presented a series of improvements in ten categories, identifying implementing entity, cost, and timing	Projects in various stages
7.	Identification of High Crash Intersections in Novi 2006-2010, January 2012	Examined 60 local intersections and identified 12 as having high crash rates or high casualty ratios	Led to the following listed study
8.	Crashes at 12 Intersections, June 2012	Specific recommendations for each of the 12 intersections	Project in various stages.
9.	Wixom and Glenwood Signal Study, November 2012	Add signals and crosswalks	Complete
10.	8 Mile and Haggerty Road Safety Audit, 2014	Make extensive changes to Haggerty Road and I-696 ramps where they intersect 8 Mile Road. Short and long-term changes, based on risk analysis	Project status is unknown
11.	Novi Road 12 to 13 Mile Scoping Report, July 2014	A range of alternatives is compared to an earlier mill and overlay with no geometric changes	Reconstruction with 4-lane depressed boulevard is scheduled for summer 2016.
12.	SEMCOG Regional Bicycle and Pedestrian Travel Plan, October 2014	Aggregates and links community plans	NA
13.	Annual Non-Motorized Prioritization 2014-2015 Update, October 2014	Annual reprioritization of non-motorized projects	Projects are implemented each year
14.	RCOC Documentation	FY 2015-16 Budget, Strategic Plan, and jurisdictional map	Summary of budget shown
15.	RCOC Complete Streets Guide	Guidelines for implementing Complete Streets	Table of Contents shown
16.	Hazmat Analysis 42445 W 10 Mile Road, October 2015	Identifies lead and methane as issues for subsurface work at the site	Not relevant to the Thoroughfare Plan
17.	Master Plan Corridor Study – Grand River, Ongoing	Land use, zoning and "sense-of-place" features.	To date: Grand River was designated as a Special Treatment Corridor; specifically, an Entrance Corridor.

Source: The Corradino Group of Michigan, Inc.

3. Travel Forecasting

A central task to successfully execute this project is predicting traffic in the year 2040. Corradino developed daily and PM peak period (3-6 pm) travel forecasting models using software known as TransCAD, an industry standard. The 2015 Base Model was developed consistent with modeling of the *2011 Novi and Wixom Transportation Plan* prepared by Corradino. Additional information included SEMCOG model files and the latest traffic data provided by the RCOC, MDOT, and the Traffic Improvement Association of Michigan.

3.1 2015 Model

3.1.1 Traffic Analysis Zones (TAZs)

The Novi model traffic analysis zones (TAZs) form a subset of the SEMCOG regional model (Figure 2). The Novi model includes 148 internal zones and 54 external stations.

Corradino used the road network from its 2011 Study to create a 2015 project area network. Novi provided a list of projects that were added to the 2015 Base network.

- Novi Road Reconstruction – Widen from two to five lanes (RCOC project, completed in 2011);
- Reconstruct Grand River Avenue – Novi Road to Haggerty Road (RCOC project, completed in 2012); and,
- Haggerty Road – Add second SB lane to fill gap at Stonehenge (completed in 2014).

Corradino reviewed Google aerial mapping (imagery date 4/11/2015) to ensure the 2015 Base network represented the existing condition of roadways in Novi. The review indicates that 8 Mile Road currently has two lanes in each direction from South Lexington Boulevard to Haggerty Road at the southern edge of the Novi study area.

Corradino made additional refinements to the road network to incorporate a few, key local roads into the network. Figure 3 illustrates the new links, in orange, that were added to the 2015 Base network.

3.1.2 Traffic Data

Corradino collected the latest traffic data from:

- RCOC;
- SEMCOG; and,
- MDOT.

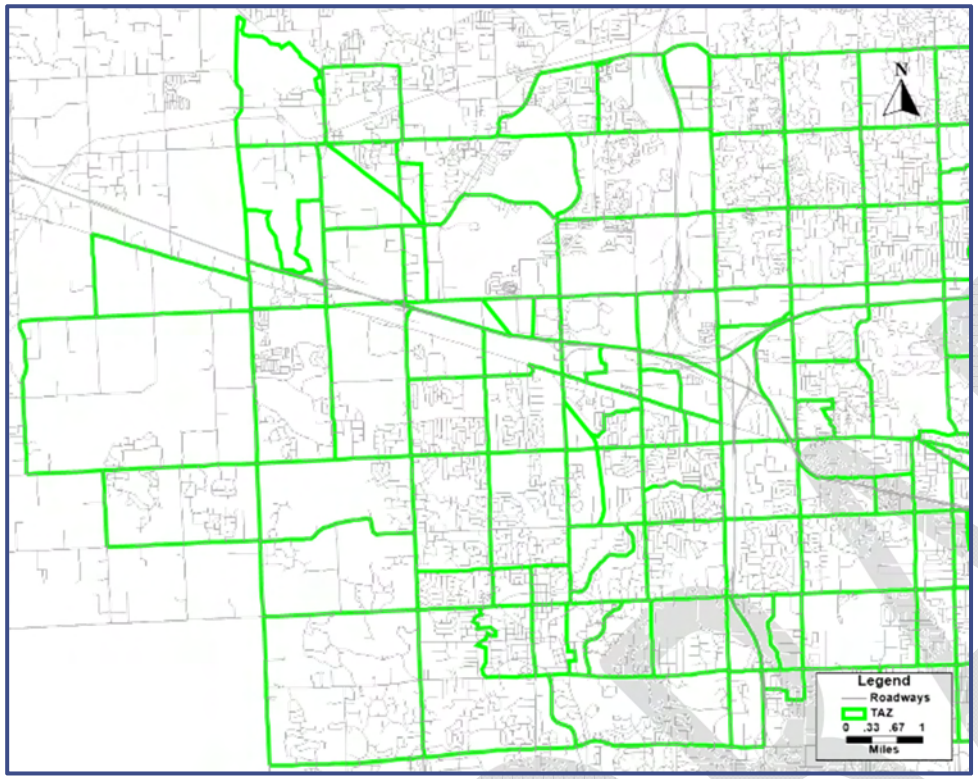
Both daily and PM peak period traffic counts were assembled for arterials, local roads, and freeways (I-96, I-275, I-696, and M-5) throughout the Novi study area. A blend of data was used for model development, depending on availability and quality (recent vs. old counts). Table 2 summarizes use of these data sources.

Table 2. Utilization of Traffic Data Sources

Data Source	Daily Counts		PM Peak Counts		Year of Data Used
	Freeways	Arterial and Local Roads	Freeways	Arterial and Local Roads	
RCOC		√		√	2012–2015
SEMCOG	√	√	√	√	2011–2014
MDOT	√				2014

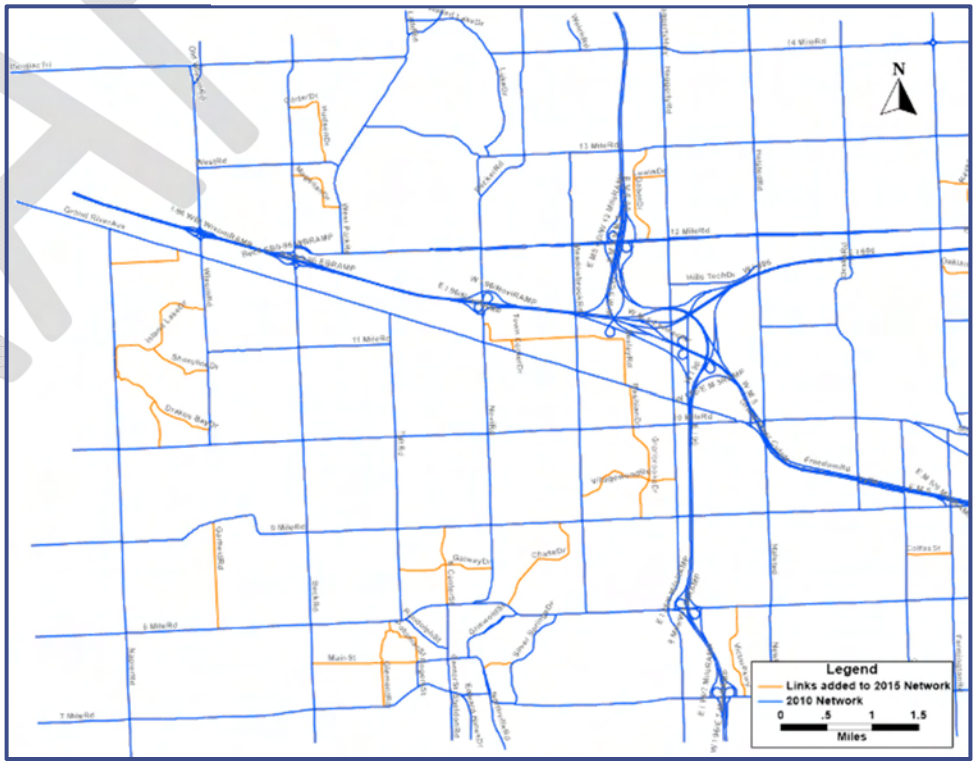
Source: The Corradino Group of Michigan, Inc.

Figure 2. 2015 Base Model Traffic Analysis Zones (TAZs)



Source: The Corradino Group of Michigan, Inc.

Figure 3. 2015 Refined Base Network



Source: The Corradino Group of Michigan, Inc.

For some roadway segments where PM peak period traffic counts were not available, time-of-day (TOD) factors were derived from data collected in the 2011 Study or older counts from aforementioned sources, then applied to the latest daily counts to obtain PM peak period traffic. Model development required counts to be coded by direction, which is particularly critical for the PM model, as traffic flows show significant directional difference during the afternoon peak. For roadway segments for which directional counts were not available, directional factors were derived from data collected in the 2011 study. A reasonable 50/50 split was also used for daily directional counts at some locations. This data collection effort resulted in a sufficient sample size of daily counts (501) and PM peak period counts (425), to provide very good coverage of all roadways in the Novi study area.

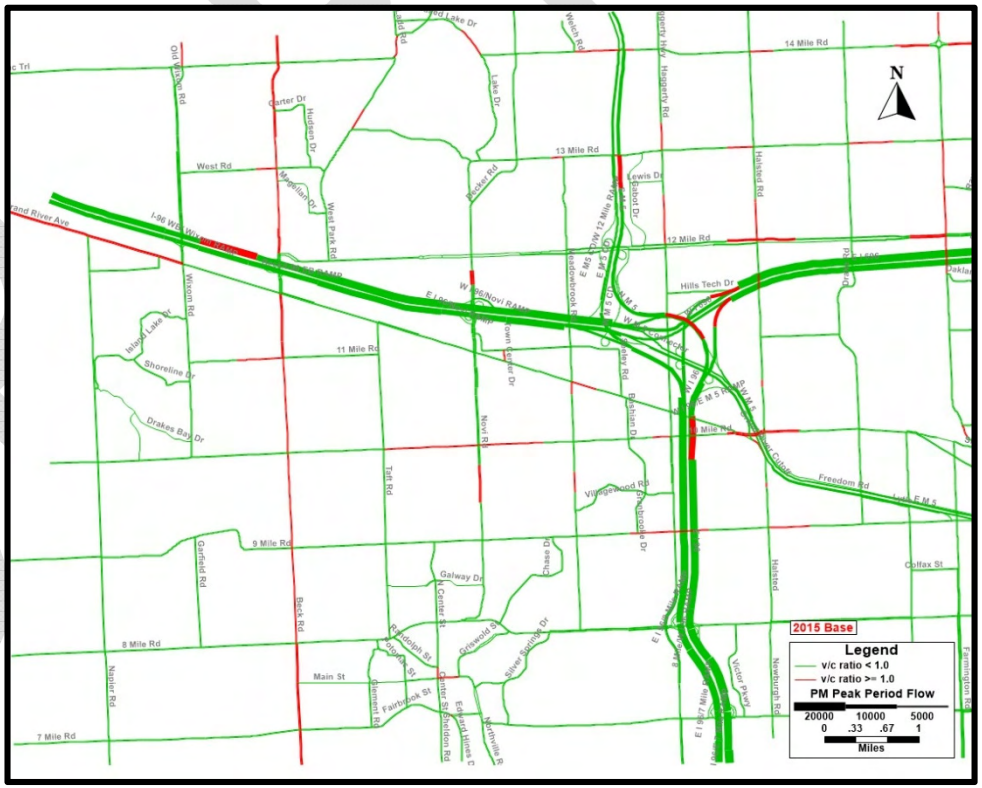
3.1.3 2015 Base Model Calibration

The 2015 Base Model is calibrated to the latest traffic counts using the Origin-Destination Matrix Estimation (ODME) technique in TransCAD. The ODME is an iterative process that switches back and forth between a traffic assignment stage and an OD matrix estimation stage, until the estimated OD matrix achieves assigned network flows with the least difference from observed traffic counts.

The 2010 daily and PM peak period trip tables, which were extracted from the SEMCOG model and used in the 2011 Study, were used separately as "seed" matrices in the ODME process. The daily model has a Root Mean Square Error percentage (RMSE%) of 18.5%, and the PM peak period model has a RMSE% of 8.3%, each of which indicate the modeled volumes are very close to traffic counts from a system-wide perspective. On I-96, the correlation of traffic counts with model-assigned volumes is even closer (Daily:8.69%; Peak period; RMSE=8.46%). The optimum RMSE is 0.0%.

Figure 4 shows the 2015 volume/capacity (V/C) ratios in the PM peak period. In this analysis, RED indicates the V/C ratio exceeds 1.00, reflecting significant congestion. GREEN indicates significant congestion is not detected by the model. It is noted that the TransCAD model is measuring congestion primarily based on the physical width of the roadway pavement and determines if it is adequate to serve the traffic volume. Where it cannot, the model calculates a V/C ratio equal to or greater than 1.0.

Figure 4. 2015 PM Peak Period Traffic Conditions



Source: The Corradino Group of Michigan, Inc.

This analysis concentrates on "significant" congestion, i.e., V/C >/= 1.0. There are a number of roads in Novi that have heavy traffic and do not meet this criterion so will not show as RED on Figure 4. For example, volume/capacity ratios for I-96 WB (PM peak direction) between Novi Rd and M5 range between 0.89 and 0.96. Congestion on I-96 in the study area is also evident in 2040 when the V/C ratios are as high as 0.99. They just don't reach 1.0. Further, in the real world, freeway congestion is usually felt by weaving, merging and diverging behaviors. A travel demand model is not able to capture these operations. It accounts for capacity-constrained delays.

3.2 2040 E+C Model

The City of Novi provided a list of projects that are in the it's Six-Year Plan that will improve roadway link capacity or change road geometry. They are identified as *existing and committed* (E+C) projects and are coded into the study's 2040 E+C network. SEMCOG's latest 2014–2017 Transportation Improvement Program (TIP) was also reviewed to identify E+C projects. The TIP does not show roadway link capacity improvements in Novi. There is a new roundabout project on Orchard Lake Road at 14 Mile Road, according to the TIP. Although this project is not within the Novi city limits, it is coded into the 2040 E+C network as it will change road geometry in the model network. Table 3 summarizes the E+C projects.

The 2010 and 2035 trip tables used in the 2011 Study, which were extracted from the SEMCOG model, were used to estimate origin-to-destination (trip) growth. The production and attraction of each zone were interpolated for the 2015 Base Year and were extrapolated for the 2040 Future Year. For each zone, the 2015–2040 growth was derived using a ratio method and a net growth (difference) method separately. The final 2040 zonal control totals are the average of the two methods. This estimation procedure of future trips is consistent with the method recommended by *NCHRP 255: Highway Traffic Data for Urbanized Area Project Planning and Design*.

The 2040 OD matrix was then obtained by applying a growth factor (Fratar) process to the 2015 ODME-calibrated trip matrix. The aforementioned process was performed for daily and PM peak period traffic, separately.

The 2040 OD matrices were then assigned to 2040 E+C network. Figure 5 shows the 2040 V/C ratios for the E+C network in the PM peak period.

3.3 Existing and Future Traffic Conditions[2]

Table 3. 2040 E+C Projects

2040 E+C Projects	Source
Crescent Blvd. Extension – Novi to Grand River (Ring Rd.)	Novi Six-Year Plan
Taft Rd. at 9 Mile Rd., New Roundabout to Replace All-way Stop	Novi Six-Year Plan
11 Mile Rd. at Wixom Rd., Add Roundabout to Replace Stop Control on 11 Mile Rd.	Novi Six-Year Plan
Construct Modern Roundabout on Orchard Lake Rd. at 14 Mile Rd.	SEMCOG 2014-2017 TIP

Source: The Corradino Group of Michigan, Inc.

Table 4. Novi Trip Growth – 2015 to 2040

Year	Novi Total Trips	
	Daily	PM
2015	1,447,125	356,470
2040	1,518,272	375,859
Growth %	4.9%	5.4%

Source: The Corradino Group of Michigan, Inc. and SEMCOG database

[2] This discussion is limited to non-interstate roads.

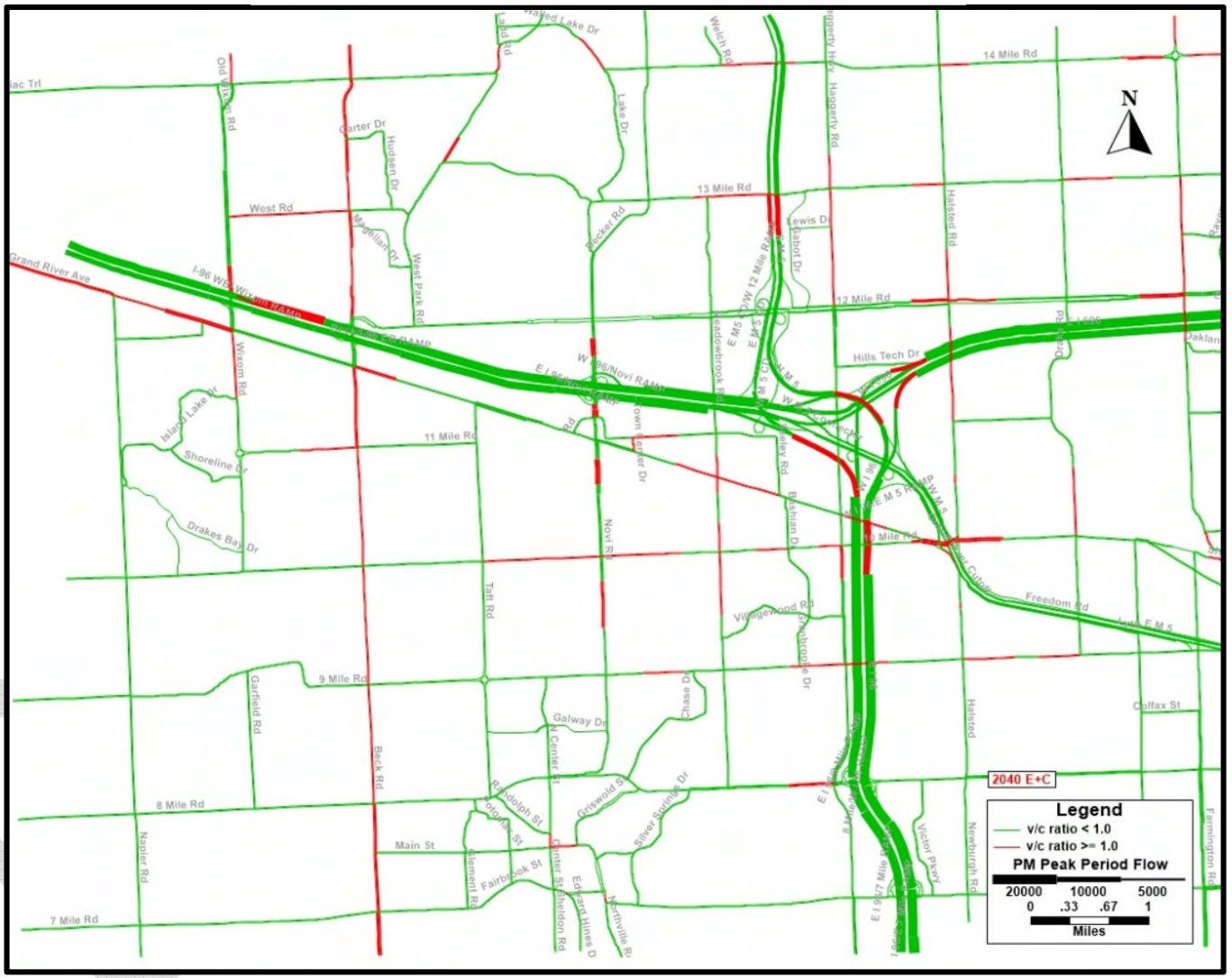
Based on the above discussion, the growth in trips in Novi from 2015 to 2040 is forecast to be 4.9% on a daily basis and 5.4% during the afternoon peak period (Table 4).

In 2015 (Figure 4), Beck Road has the most extensive congestion in Novi. Most "Mile Roads" experience some PM peak period congestion. Sections of 10 Mile Road are also very congested in the afternoon peak period.

By comparing Figures 4 and 5, it can be seen that in 2040 Beck Road will continue to be the road with the most continuous congestion in Novi, if improvements are not made. Sections of 10 Mile Road continue to be congested.

The discussion of transit and non-motorized modes, plus highway intersections, is included in Section 5 of this report.

Figure 5. 2040 E+C PM Peak Period Traffic Condition



Source: The Corradino Group of Michigan, Inc.

4. Public Engagement

Throughout the project, input was received through the web-based application known as *Community Remarks* (Figure 6), the results of which are included in a separate Public Involvement Diary. Each public comment received a response. The categories of "Safety and Traffic Calming," "Intersection Improvements," and "Pedestrian Improvements" received more than 75% of the comments. Other comments were divided among "Roadway Improvements" (ten comments), "Bicycle Improvements" (three comments), and "Transit" (two comments). In all, Community Remarks received over 2000 "hits" by people visiting the site.Over the course of the project, four public meetings were conducted. All but the February, 2016, meeting was preceded by a Novi Planning Commission meeting. Notes of each meeting are included in the *Public Information Diary*.

Figure 6. *Community Remarks* Application

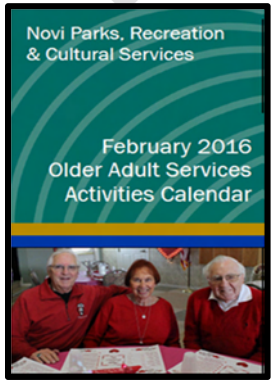
Source: The Corradino Group of Michigan, Inc.

Turning Point Voting Touch-pads

At the meetings in December, 2015, and February, 2016, those in attendance were asked, using a touch-pad polling system known as *Turning Point,* to provide their opinion on eight topics. In summary, the results (Figures 7a and 7b), indicate the meeting attendees were older adults (Question 1) and drove fewer than ten minutes in the off-peak hours to volunteer or work (Questions 3 and 4). None biked or walked on a regular basis, for a variety of reasons (Questions 5 and 6). Oddly though, when asked about the most important items that would enhance Novi's transportation system, improvements to streets/sidewalks, biking facilities, and traffic signal timing were cited in almost equal amounts (20% to 25%) as the most preferred; roadway widening was preferred by fewer than 10% of the respondents (Question 7). These independent opinions closely align with the comments received through the *Community Remarks* application.

December 10, 2015
Novi Police Training Center

February 10, 2016
Older Adults Services,
Meadowbrook Commons



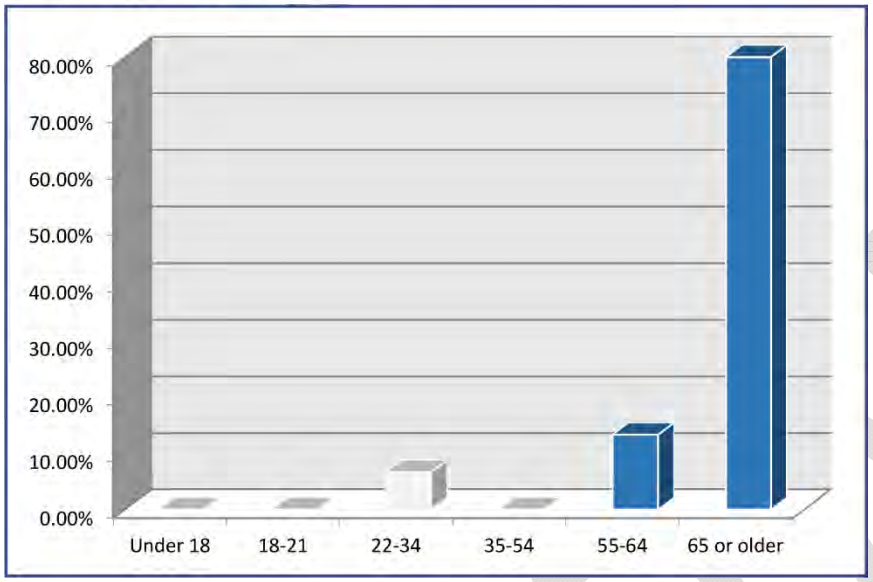
April 28, 2016
Novi Civic Center

June 23, 2016
Novi Civic Center

Figure 7a. Touchpad Voting Results

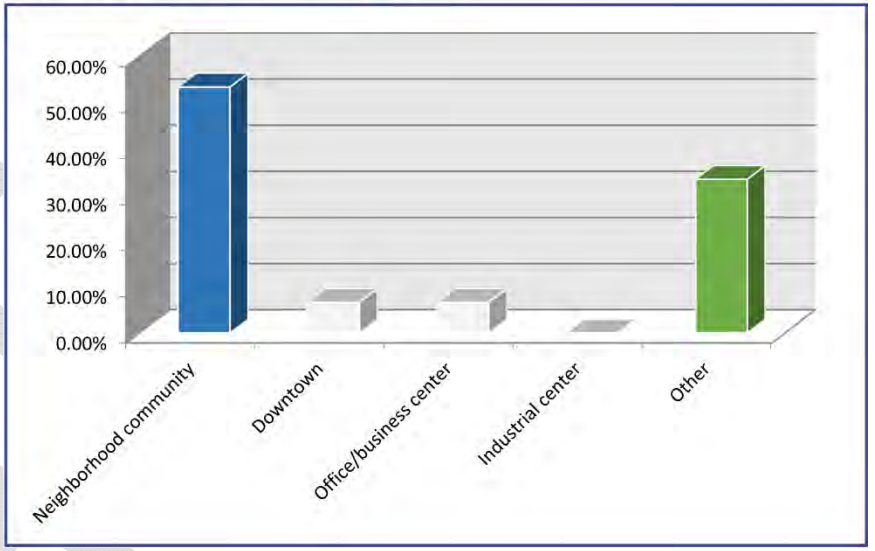
1. What is your age group?

The polling results indicate the participants in the public meetings in December and February were overwhelmingly over 55 years of age.



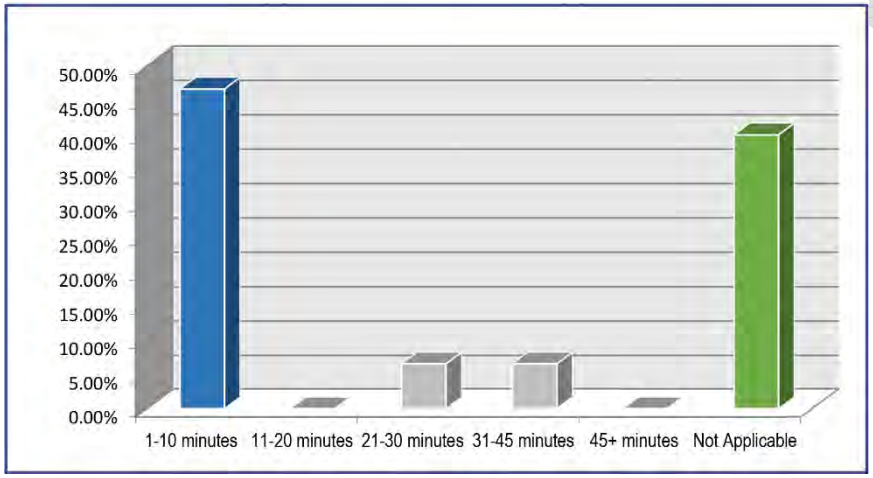
2. How would you describe where you work/volunteer?

Consistent with the age of the meeting attendees, it is logical that most indicated their place or work/ volunteering was "neighborhood/community" and "other."



3. If you commute, how long does it take for you to arrive at work/volunteering place?

The morning commute is 10 minutes or less for about 45% of the meeting attendees and another 40% of the attendees indicated the "commute to work" question was not applicable to them, reflecting the age of the attendees.



4. When is the time of day that you experiencethe most delay?

The overwhelming number of meeting attendees travel outside the AM and PM peaks.

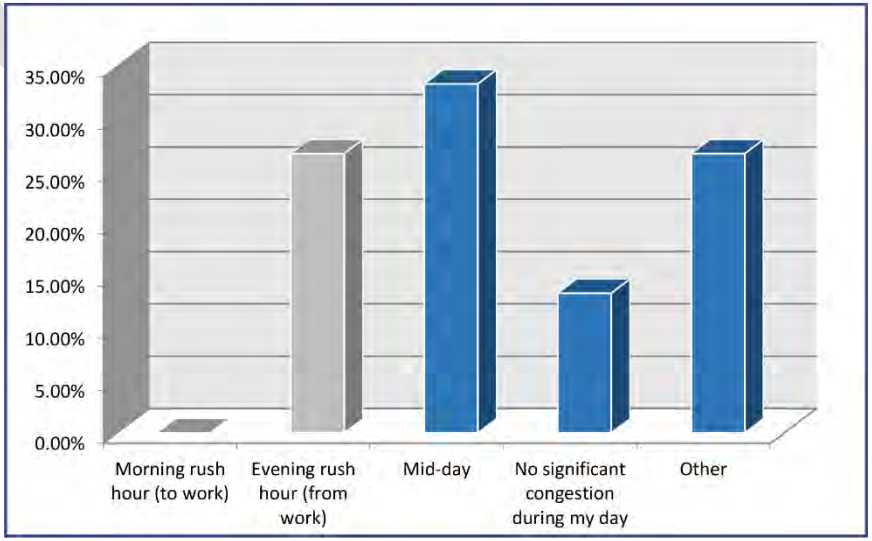
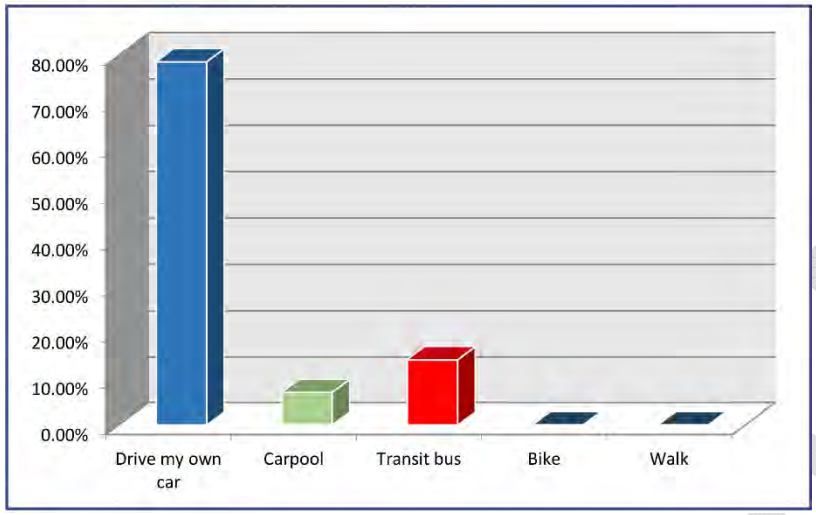


Figure 7b. Touchpad Voting Results

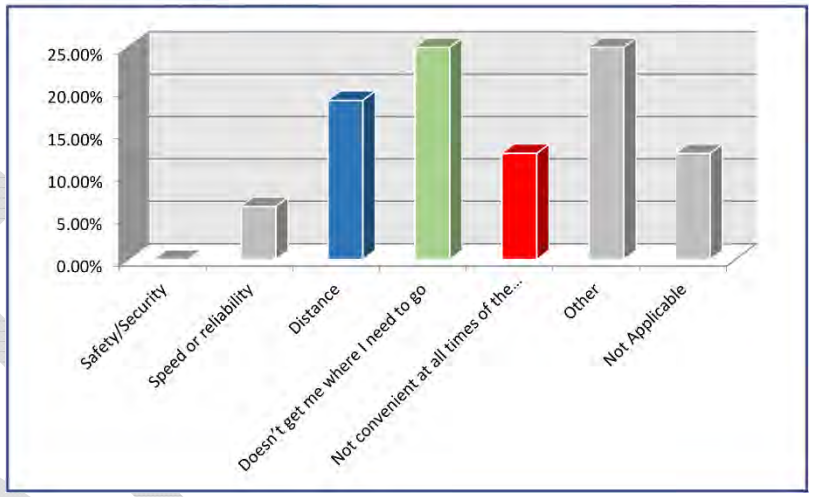
5. For my day-to-day travel I use the following transportation modes: (Multiple Response)

While over three-quarters of the meeting attendees chose to drive their car, one-quarter of the meeting attendees either carpool or use transit.



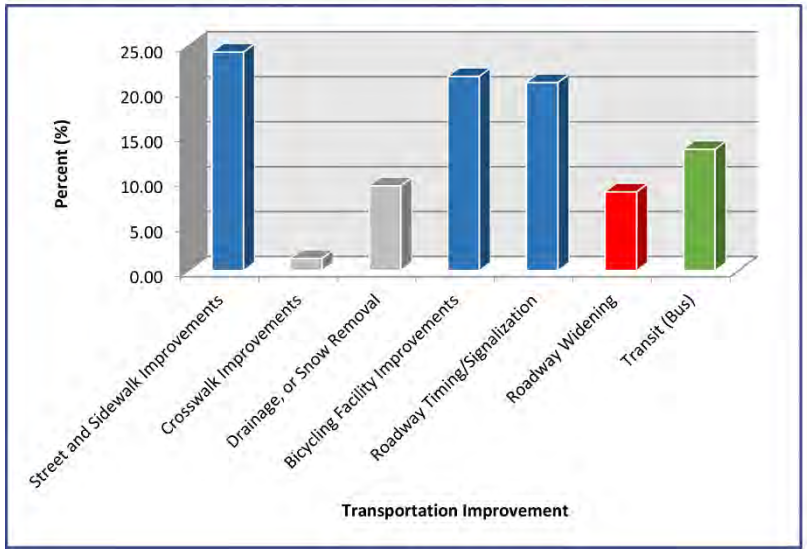
6. If you don't bike, walk, or take transit the primary reason for NOT DOING this is?

Many of the respondents choose NOT to bicycle, walk, or take transit because of concerns with the distance of the trip, connectivity, and convenience.



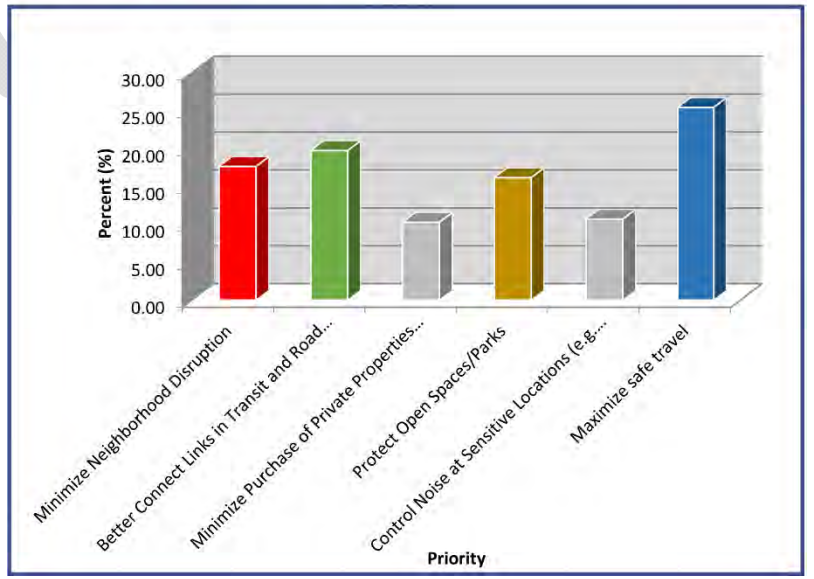
7. The top THREE transportation items I would like to see enhanced in Novi are....

The respondents in almost equal numbers would most prefer improvements to street/sidewalk, roadway signalization and bicycling facilities. The latter is odd, when considering the age of the respondents and the non-use of bicycling. A greater number would prefer transit than road widening.



8. When transportation improvements are made, which items are of most importance to you?

Most meeting participants feel maximizing safe travel is of most importance. But, that number is only slightly more than those who want to improve connectivity in the transportation network and minimize disruption to neighborhoods, parks and open spaces.



5. Multi-modal Alternatives

5.1 Roads

Multi-modal transportation elements were examined in layers, beginning with the most costly-to-implement element – roads. Analysis of 2040 traffic conditions are illustrated in Figure 8 which shows the 2040 volume/capacity (V/C) ratios in the PM peak period. In this analysis, RED indicates the V/C ratio exceeds 1.00, reflecting significant congestion. GREEN indicates significant congestion is not detected by the model. To determine the potential positive impact on congestion, a series of tests was executed (Table 5). Data on the vehicle miles traveled in congested conditions, otherwise known as VMT, were developed (Figure 9a). Also, the hours that vehicles spend in congested conditions were calculated in the traffic assignment model (Figure 9b). The results point to the following alternatives that lessen congestion more than others as pointed out by the green arrows ( ).

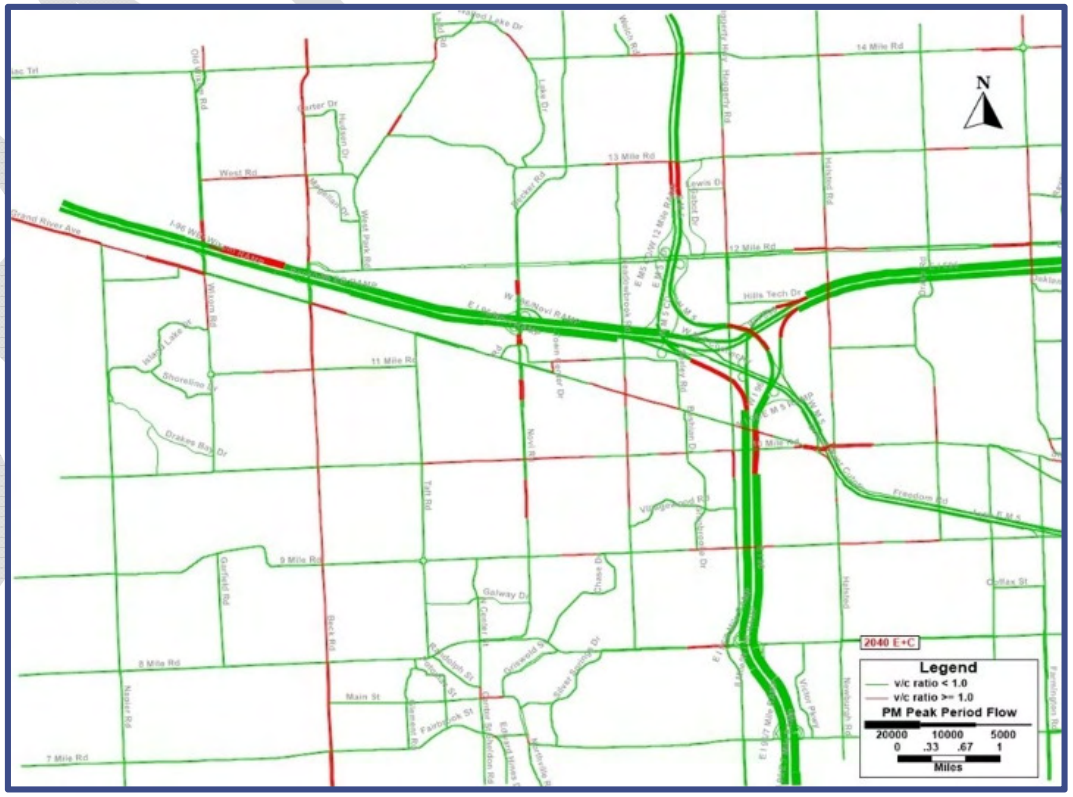
- Alternative 3: Widen Beck from Pontiac Trail to 12 Mile;[3]
- Alternative 7: Widen Beck from Grand River to 8 Mile; and,
- Alternative 11: Widen 10 Mile from Haggerty to Taft.

Combinations of these alternatives were then tested (Table 6). The same two measures of congestion relief were computed. The results in Figures 10a and 10b indicate that the most cost-effective alternative is Alternative I (see) which combines widening Beck Road from 8 Mile Road to Pontiac Trail (Alternatives 3 and 7) and 10 Mile Road from Haggerty to Taft (Alternative 11). The slight improvement with Alternative H comes with the increased cost to widen Meadowbrook Road between 10 and 12 Mile Roads. That link is to be included in a later stage of implementation.

It is also noted that Alternative G is the most expansive improvement scenario as it combines all roads needing improvement but an Alpha Road extension (Alternative 2) and connecting Meadowbrook Road to Twelve Oaks Mall (Alternative 8) because these two projects are too localized to ease congestion.

Alternative G should perform well and demonstrate what could happen if all of Novi's road needs were satisfied. This cannot be accomplished in the near term; there are funding, impact and policy constraints that prevent more road widenings than Beck and 10 Mile Roads. It is further noted that widening Beck and 10 Mile Roads does not address all the congestion expected in 2040, as evidenced by the red/congested paths on Figure 11. Proposed intersection improvements will address a number of locations expected to be congested in the future. These are covered in Section 7.2 of this report (Figure 12).

Figure 8. 2040 E+C PM Peak Period Traffic



Source: The Corradino Group of Michigan, Inc.

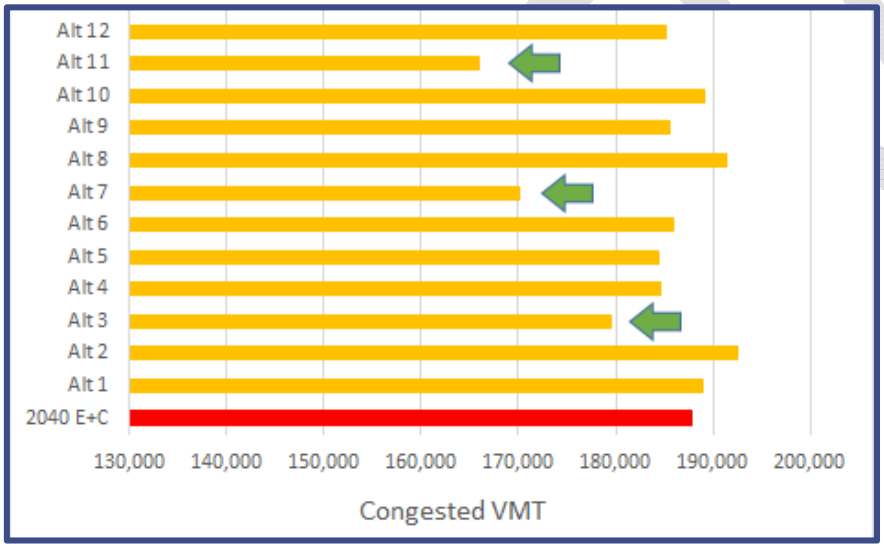
[3] Note that Beck Road from I-96 north to Pontiac Trail is in Wixom, but fixing that road was tested as it affects Novi.

Table 5. Basic Alternative Improvements Tested to Relieve Congestion

Alt 1 (Widen 12 Mile from Beck to Cabaret Dr)
Alt 2 (Connect Alpha Tech Dr to Beck with Road Extension)
Alt 3 (Widen Beck from Pontiac Trail to 12 Mile)
Alt 4 (Widen Grand River from Napier to Wixom)
Alt 5 (Widen Grand River from Novi to Haggerty)
Alt 6 (Widen Meadowbrook from 10 Mile to 12 Mile)
Alt 7 (Widen Beck from Grand River to 8 Mile)
Alt 8 (Connect Meadowbrook to Twelve Oaks Mall with New Road)
Alt 9 (Widen Haggerty Rd from 12 Mile to Grand River)
Alt 10 (Extend Taft Rd over I-96)
Alt 11 (Widen 10 Mile from Haggerty to Taft)
Alt 12 (Widen Novi from 9 Mile to Nick Lidstrom Dr.)

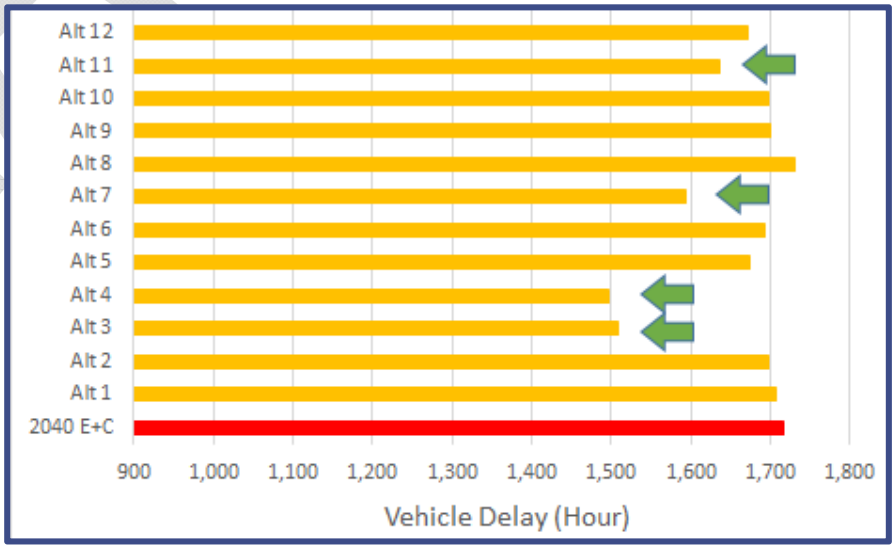
Source: The Corradino Group of Michigan, Inc.

Figure 9a: Basic Alternatives Test Results
PM Peak Period Over-capacity Vehicle Miles of Travel
(Volume/Capacity ≥ 1.0)



Source: The Corradino Group of Michigan, Inc.

Figure 9b: Basic Alternatives Test Results
PM Peak Period Vehicle Hours of Congested Travel
(Volume/Capacity ≥ 1.0)



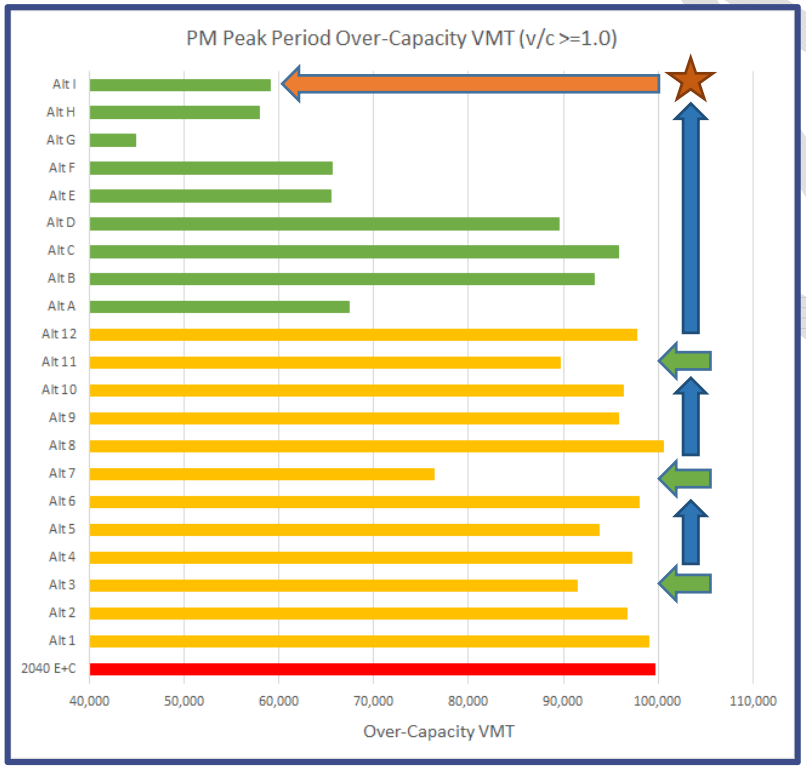
Source: The Corradino Group of Michigan, Inc.

Table 6. Combination Alternatives Tested to Ease Congestion

Alt A (Alt 3 + 7) (Widen Beck Road: Pontiac Trail to 8 Mile)
Alt B (Alt 5 + 6) (Widen Grand River: Novi to Haggerty + Widen Meadowbrook: 10 Mile to 12 Mile)
Alt C (Alt 6 + 9) (Widen Meadowbrook: 10 Mile to 12 Mile + Widen Haggerty: 12 Mile to Grand River)
Alt D (Alt 5 + 6 + 9) (Widen Grand River: Novi to Haggerty + Widen Meadowbrook + Widen Haggerty)
Alt E (Alt 3 + 7 + 10) (Widen Beck + Extend Taft over I-96)
Alt F (Alt 3 + 6 + 7) (Widen Beck + Widen Meadowbrook)
Alt G (All but Alt 2, 8) (All but Alpha Road Extension + Connect Meadowbrook to Twelve Oaks Mall)
Alt H (Alt 3 + 6 + 7 + 11) (Widen Beck + Widen Meadowbrook + Widen 10 Mile)
Alt I (Alt 3 + 7 + 11) (Widen Beck + Widen 10 Mile)

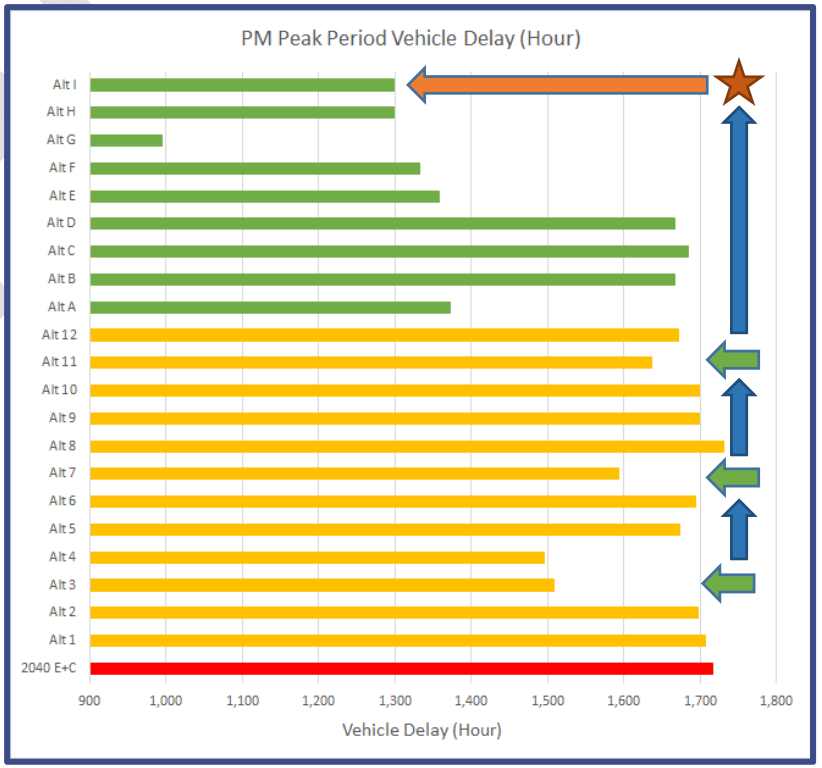
Source: The Corradino Group of Michigan, Inc.

Figure 10a: Combination Alternatives Test Results
PM Peak Period Over-capacity Vehicle Miles of Travel
(Volume/Capacity ≥ 1.0)



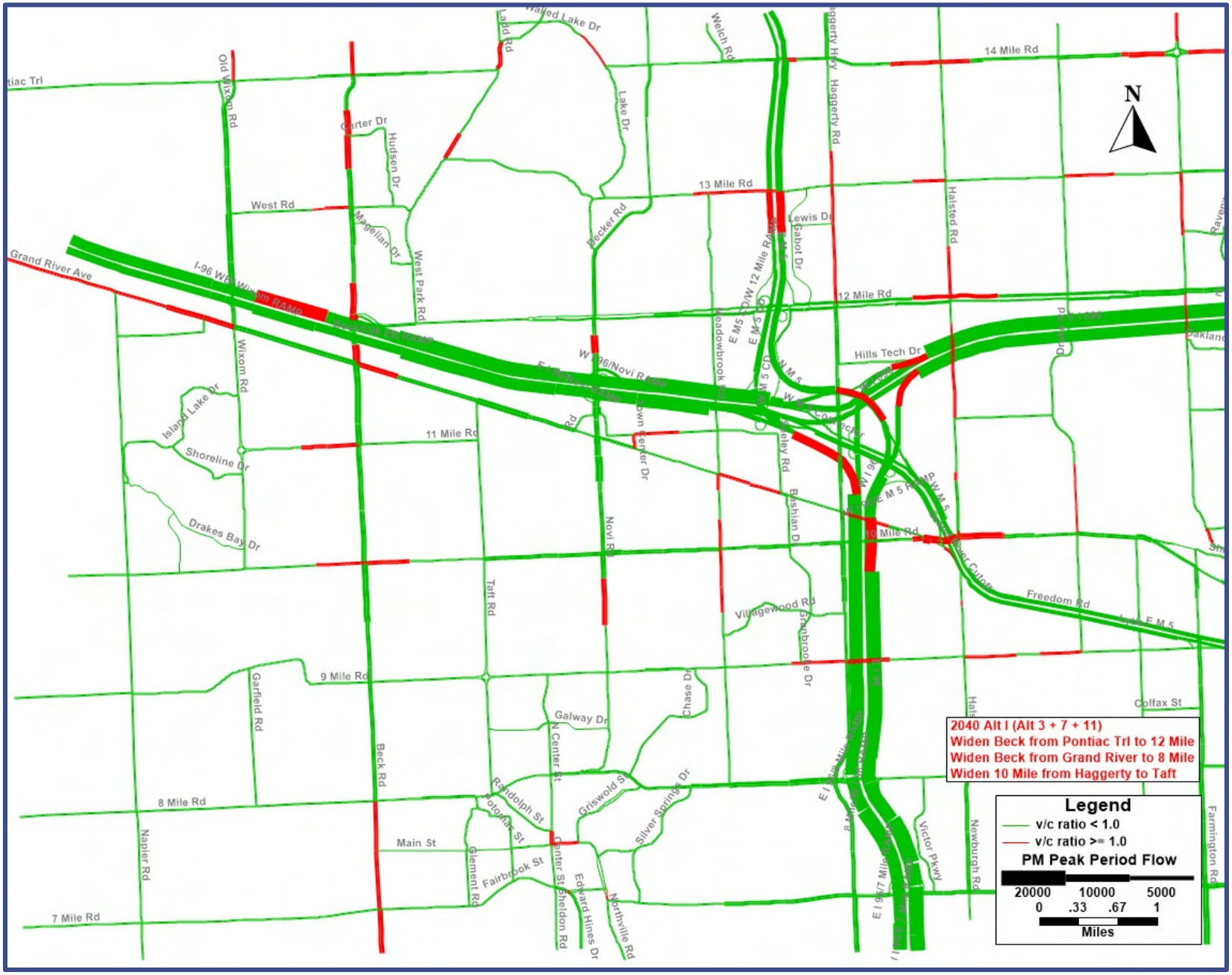
Source: The Corradino Group of Michigan, Inc.

Figure 10b: Combination Alternatives Test Results
PM Peak Period Vehicle Hours of Congested Travel
(Volume/Capacity ≥ 1.0)



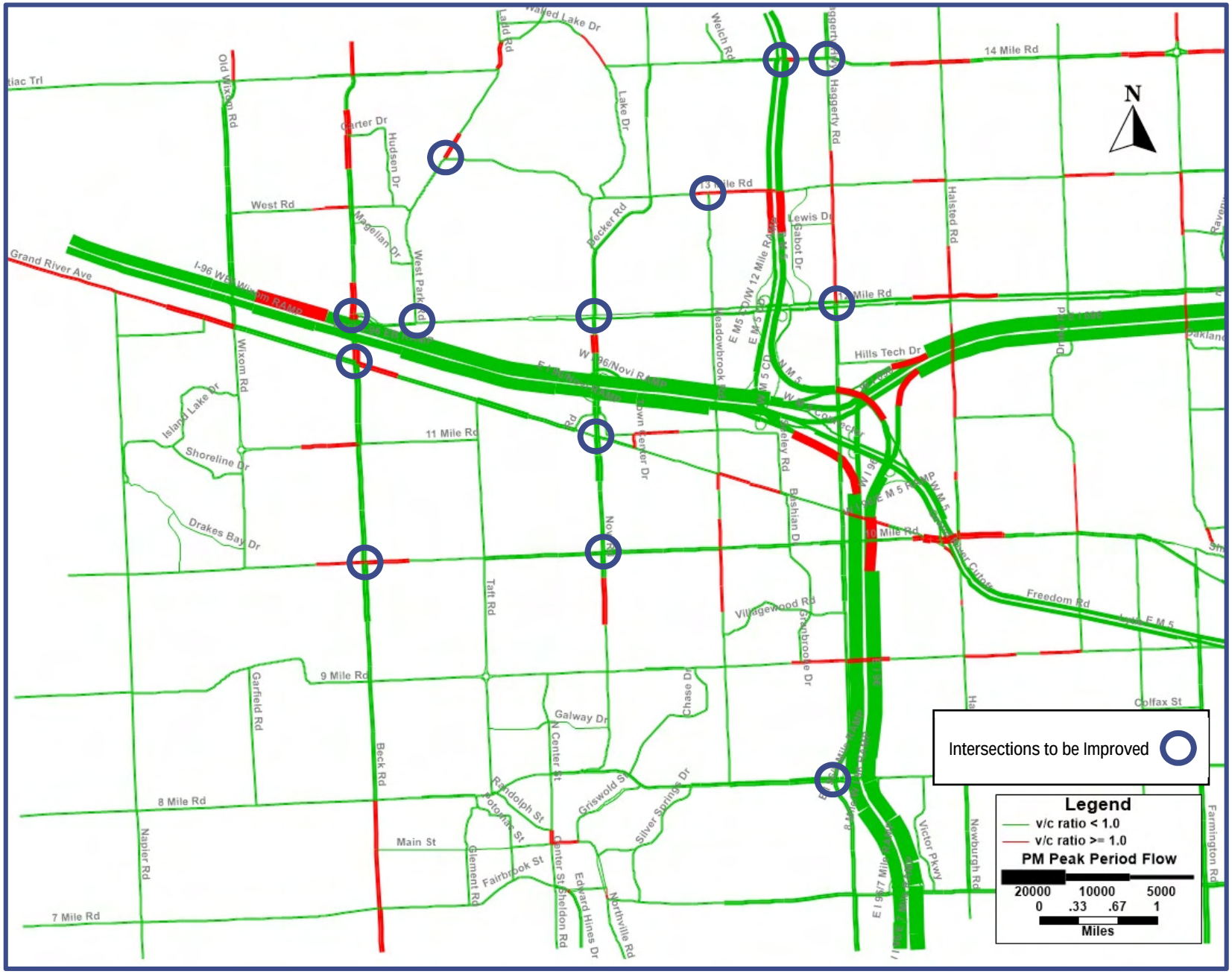
Source: The Corradino Group of Michigan, Inc.

Figure 11. Alternative I with 2040 Traffic



Source: The Corradino Group of Michigan, Inc.

Figure 12. Novi Intersections Proposed to be Improved



Source: The Corradino Group of Michigan, Inc.

5.2 Non-Motorized

With the road priority to improve Beck and 10 Mile Roads, the non-motorized system was examined. It incorporates the city's annual process for identifying and prioritizing its potential non-motorized projects. That process allocates points to proposed sidewalk and pathway segments to prioritize them. Sidewalks, per city ordinance, are six feet wide, pathways are eight feet, and trails are ten feet wide. The screening includes the following factors:

1. Number of crashes within a segment;
2. Road speeds and volumes;
3. Access provided to schools – number and proximity;
4. Access provided to parks;
5. Access provided to hotels;
6. Access provided to shopping;
7. Access provided to places of worship;
8. Connection to system;
9. Population served;
10. Proportion of segment being completed;
11. Expressed public interest; and,
12. Support of the Master Plan.

The top 20 segments that emerge from the screening using these factors are then analyzed again using the following criteria:

1. Ease of construction;
2. Right-of-way availability;
3. Availability of "outside" funding;
4. Relationship to sidewalk or pathway on opposite side of street;
5. Opportunity for private development to build segment; and,
6. Evidence of existing use (worn path).

Some projects/segments that perform well in the priority ranking, but are considered to be part of future development projects, are placed in a "deferred" category pending the associated development project proceeding.

The pace of implementation depends on funding. As each of the top 20 sidewalk/pathway segments are completed, new projects advance to the top 20 for assignment of implementation dates. The current top 20 projects, as listed in the *Annual Non-Motorized Prioritization 2015-16 Update*. are shown in Table 7.

Based on the roadway projects being considered as part of the Thoroughfare Master Plan, seven top 20 listed sidewalk/pathway projects would be constructed as the corresponding roadway segment is improved along Beck Road, between 8 Mile Road and Grand River Avenue, and 10 Mile Road between Taft Road and Haggerty Road (Table 8 and Figure 13). Other non-motorized projects will continue to be implemented under the Thoroughfare Master Plan as part of Novi's Annual Non-Motorized Prioritization Process.

Table 8. 2015–16 Top 20 Priority Pathway/Sidewalk Segments Associated with Potential Road Widening Projects

Road Segment		Non-motorized Project	Non-motorized Length	Capital Improvement Program Yr.	Cost
P7	Beck Road – 8 Mile to Grand River	Rank 8 – No. 39, west side	1,100'	2017–2018	$155,000
P11	10 Mile – Taft to Haggerty	Rank 1 – No. 81b, south side Rank 7 – No. 62, north side Rank 11 – No. 90, south side	2,750' 400' 2,400'	2017–2018 & 2019–2020 2015–2016 2018–2019	$775,000

Source: The Corradino Group of Michigan, Inc.

Table 7. Table 4A from Annual Non-Motorized Prioritization 2015-16 Update

Annual Non-Motorized Prioritization: 2015-2016 Update

Table 4A:
2015-16 Top 20 Priority Pathway and Sidewalk Segments excluding deferred segments
City of Novi

Overall Segment Rank	Segment Item #	Section #	Type	Side of Street	Location	From	To	# of Pieces in Segment	Segment Length (ft.) excluding Developer Planned & Completed Pieces	Notes
1	81B		P	south	**Ten Mile**	Willowbrook	Haggerty	1	2,750	17-18 & 19/20 CIP
2	81A	25	P	south	**Ten Mile**	Meadowbrook	Willowbrook	1	2,530	17-18 & 19/20 CIP
3	9B	4	S	south	**Pontiac Trail**	Wedgewood	West Park	2	2,560	16-17 & 17-18 CIP
5	120A	36	S	west	**Haggerty**	Eight Mile	N of Orchard Hill	2	1,390	
6	9A	4	S	south	**Pontiac Trail**	Beck	Wedgewood	1	2,440	16-17 & 17-18 CIP
7	62	22	S	north	**Ten Mile**	Eaton Center	Churchill Crossing	1	400	15-16 CIP
8	39	17	P	west	**Beck**	Eleven Mile	Providence	1	1,100	17-18 CIP
9	93B	27	S	north	**Nine Mile**	Plaisance	Taft	2	650	
11	90	26	P	south	**Ten Mile**	Novi Rd.	Chipmunk	1	2,400	18-19 CIP
11	119c	36	S	east	**Meadowbrook**	Eight Mile	N of Llewelyn	1	1,200	18-19 CIP
13	84B	25	S	east	**Meadowbrook**	Nine Mile	Chattman	1	2,050	19-20 CIP
14	119B	36	S	east	**Meadowbrook**	Singh Blvd	N of Llewelyn	1	1,300	18-19 CIP
15	93A	27	S	north	**Nine Mile**	Novi Rd.	Plaisance	1	2,650	
16	70	23	P	west	**Meadowbrook**	Eleven Mile	Gateway Village	3	900	
17	99A	29	P	south	**Ten Mile**	Wixom	400' E of Lynwood	1	2,900	17-18 CIP
20	5	2	S	south	**Fourteen Mile**	Beachwalk Apartments	East Lake	1	600	19-20 CIP
21	119A	36	S	east	**Meadowbrook**	Nine Mile	Singh Blvd	1	1,300	18-19 CIP
22	84A	25	S	east	**Meadowbrook**	Ten Mile	Chattman	1	2,350	19-20 CIP
23	99B	29	P	south	**Ten Mile**	400' E of Lynwood	Beck	1	1,100	17-18 CIP
24	120B	36	S	west	**Haggerty**	Orchard Hill	High Pointe	1	375	
									32,945	

Legend S= 6 ft. sidewalk P= 8 ft. pathway

Segments with pathways or sidewalks on most of the opposite side of the street - *note that these segments may be critical for system connectivity & must be analyzed separately for connectivity*

Segments with a higher ranking segment planned for the opposite side of the street - *note that these segments may be critical for system connectivity & must be analyzed separately for connectivity*

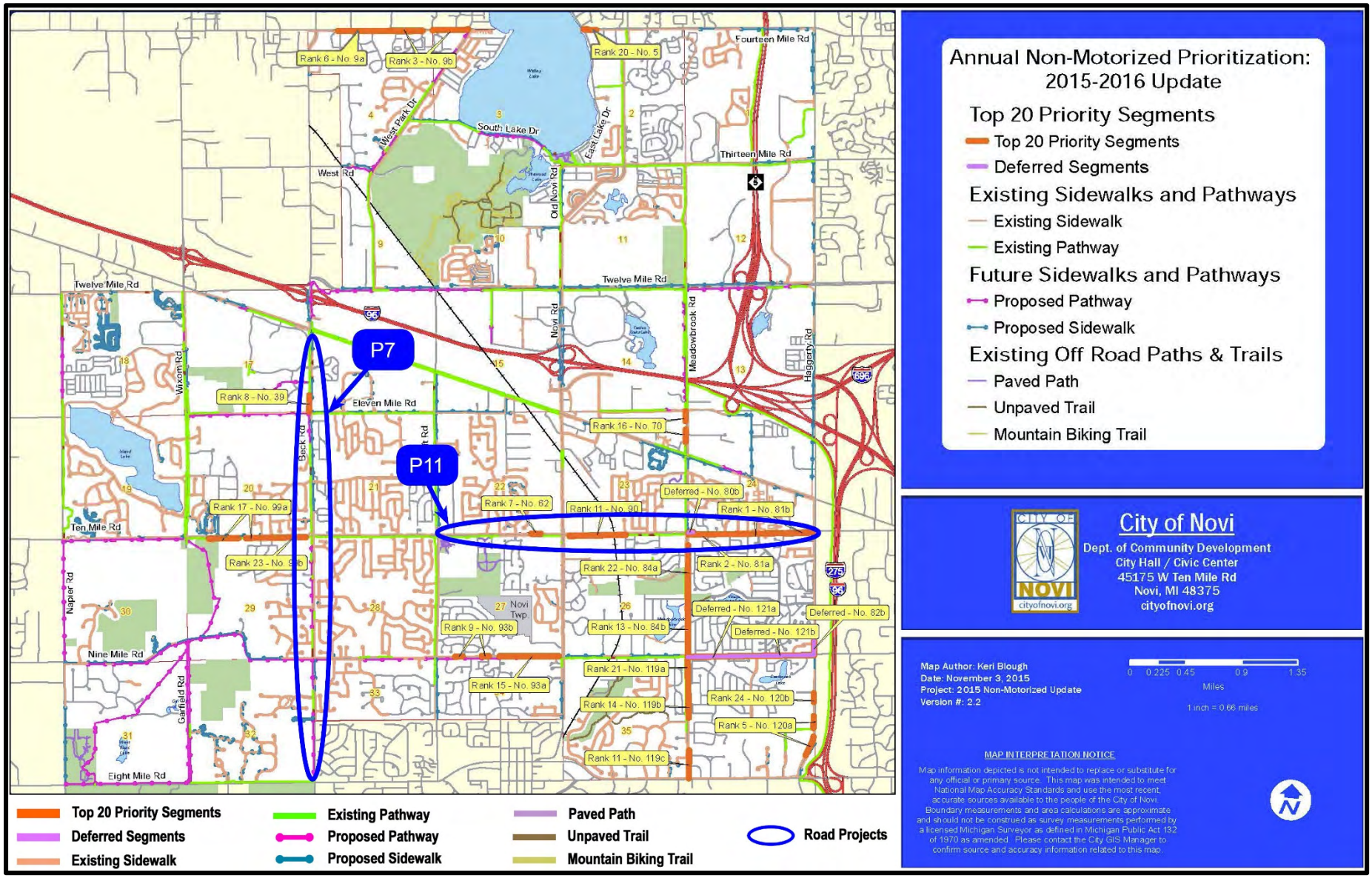
Short Segments (400 ft. or less

Scheduled Segment

CIP Budget Year

Source: Annual Non-Motorized Prioritization 2015-16 Update

Figure 13. Proposed Thoroughfare Road Improvement Projects Superimposed on 2015–16 Top Priority Pathway and Sidewalk Segments Map



Source: City of Novi, Michigan, and The Corradino Group of Michigan, Inc.

5.3 Transit

5.3.1 Regional Transit

To improve transit, a regional approach was first examined by linking Novi to the SMART (Suburban Mobility Authority for Regional Transportation) bus system. SMART is the transit provider in Oakland County. Its Community Partnership Program (CPP) supports local transit service in 75 municipalities by leveraging federal funding and returning those funds to local communities to build their own transit program. SMART supports both fixed route and dial-a-ride (demand responsive) services. The latter is similar to Novi's Older Adults transportation program. And, while SMART routes do not extend into Novi, as the city has opted out of the millage that underwrites service, SMART does provide some funding of the Older Adults transportation program.

It is important to note that the Regional Transit Authority (RTA) of Southeast Michigan has a measure on the ballots of Washtenaw, Oakland, Wayne, and Macomb counties in November, 2016, that, if successful, would fund regional transit. The referendum will be a regional yes or no vote; there can be no "opt out" for individual cities or counties.

RTA has developed a Regional Master Transit Plan to guide transit developments in Southeast Michigan over the next 20 years. It:

- Examines the state of the current transit system and explains what will happen if nothing changes;
- Determines the appropriate mix of transit service to meet the needs of Southeast Michigan;
- Recommends future transit service, including rapid transit and better coordination among the existing providers; and,
- Presents a funding strategy and the steps needed to make this plan a reality.

SMART's Master Transit Plan indicates Novi has an "emerging" transit demand. It offers a number of ways to serve it:

- Premium service, such as bus express routes to the Detroit-Wayne County Airport (DTW);
- Cross-county service; and,
- Demand-responsive service like Novi's Older Adults transportation program.

To examine the potential cost of a regional transit approach in the Novi TMP, a logical starting point was to extend existing SMART bus routes that today serve communities to the east. The current westernmost limit of these routes is Haggerty Road (Figure 14). Routes 330 and 740 could be extended farther to the west into Novi. Route 780 could extend south from Maple Road along Haggerty Road.

If Route 330 were extended, it could serve the many attractions along Grand River Avenue, terminating at the Providence Park Hospital campus (Figure 15). Routes 740 and 780 could follow a common path west along 12 Mile Road to circulate through the Twelve Oaks Mall. These proposals reflect the Regional Master Plan for Novi (Figure 16).

Figure 14. Current SMART Bus Service near Novi

Source: SMART

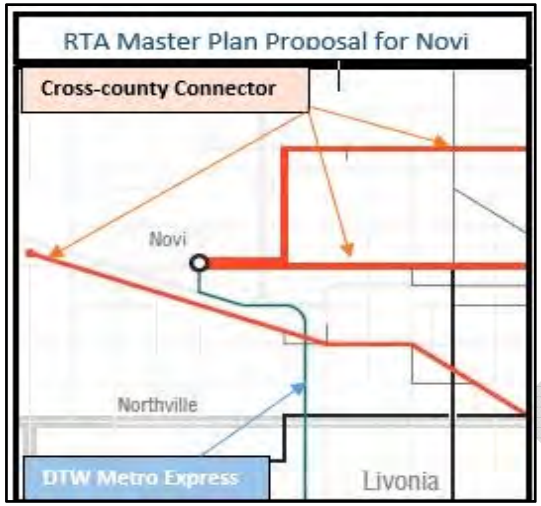
Annual costs to extend all these SMART routes, on the basis for the existing number of scheduled runs and using SMART's cost per mile and per hour, could be almost $15 million (Table 9). If limited weekday service were provided (two inbound trips in the morning and two outbound in the evening), the cost could be near $2.5 million.

In reviewing these services with the TMP Steering Committee, they were considered too expensive for Novi to cover alone, unless the regional transit millage passes.

It is estimated that 1 mil of property taxes in the City of Novi would amount to approximately $3.2 million per year. By legislative mandate, no county can receive transit services which cost less than 85% of what it contributes in taxes. If the Master Transit

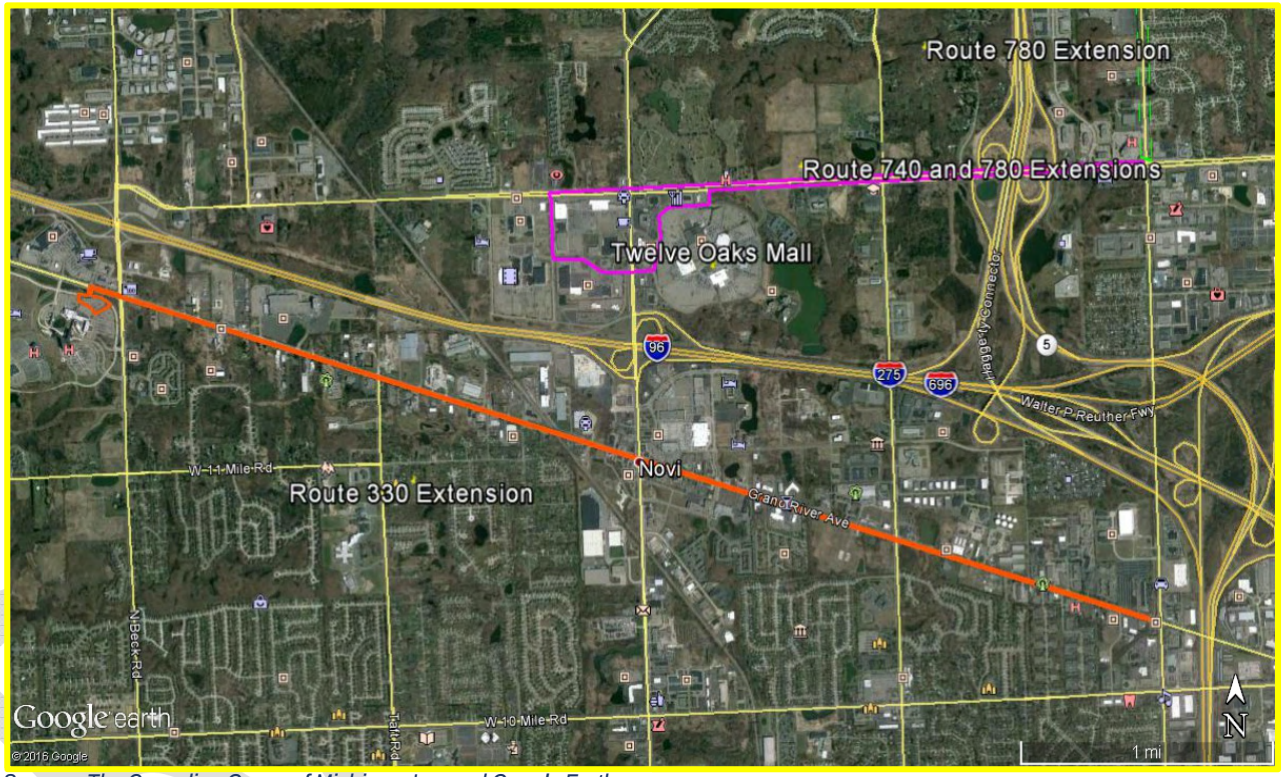
Plan services, noted above, are implemented, it appears to be good for Novi. There is a caveat: It is a formula unique to Oakland County and does not imply an 85% contribution formula applies to the City of Novi although it does look like the proposed services will be extensive for Novi.

Figure 16. RTA Master Plan Proposal



Source: SMART

Figure 15. Example Extensions of SMART Routes 330, 740, and 780



Source: The Corradino Group of Michigan, Inc. and Google Earth

Table 9. Potential Costs to Extend SMART Routes 330, 740, and 780 in Novi

	Extension in Miles	Cost/Mile*	Cost/Run	Runs/Wkday	Runs/Sat	Runs/Sun	Yearly Runs	Annual Cost
Full Service								
Extension of Route 330	9.4	$100	$940	19	14	0	5668	$5,327,920
Extension of Route 740	5.3	$ 100	$530	18	15	12	6084	$3,224,520
Extension of Route 780	9.2	$100	$920	20	17	13	6760	$6,219,200
Limited Service								
Extension of Route 330	9.4	$100	$940	4	0	0	1040	$977,600
Extension of Route 740	5.3	$100	$530	4	0	0	1040	$551,200
Extension of Route 780	9.2	$100	$920	4	0	0	1040	$956,800

**Operating Expense per Hour as reported to MDOT for 2014.*

Source: The Corradino Group of Michigan, Inc.

5.3.2 Older Adults Services Transportation

The City of Novi Older Adult Services Transportation (OAST) provides specialized transportation for Novi residents age 55+ and those under 55 with a limiting disability. Service is to medical appointments, shopping, special events, classes, etc. The program operates Monday through Friday, 8am–5pm and on Saturday, 9am–3pm; there are no Sunday operations. Reservations are required at least two days in advance and trips are scheduled based on availability. In FY 2014/2015, OAST provided 12,034 one-way rides (including for special events) using seven vehicles. Passengers may travel anywhere within the City of Novi for $3 per one-way ride and $5 per one-way ride for trips outside the city but within ten miles from the Novi Civic Center. There are complimentary rides to the Meadowbrook Activity Center, the Civic Center, Novi's Public Library, and to a City of Novi special events or programs within the city limits.

The OAST current annual budget of about $160,000 is supported by fare box revenues ($30,000), the City of Novi General Fund ($25,000), the Parks, Recreation & Cultural Fund) ($27,000), SMART ($54,450), program donations ($20,000), and advertising ($2,400), the TMP expects the service to continue in its current form which costs about $160,000 per year. Passage of the RTA plan may cover these costs.

Funding Source	Amount	% of Funding
Fare Box	$30,000	19%
Novi General Fund	$25,000	16%
Parks, Recreation	$26,916	17%
SMART	$54,454	34%
Donations	$20,000	12%
Advertising	$2,400	2%
TOTAL	*$158,770*	*100%*

Source: City of Novi, Michigan

5.3.3 Transit Circulator

A circulator between the Twelve Oaks Mall area and Town Center area was analyzed for service on Saturdays and recommended as a six-month "trial" project. The estimated cost is $45,000. The vehicles would be those of the OAST available for six hours on Saturdays. If the service proves successful, additional hours of service may be beneficial, which may require additional equipment.

Circulator Bus

5.3.4 Future Possibilities

Autonomous (self-driving) vehicles are the future of transportation around the world. Traditional modes of transportation are being inundated with technology, and as with everything else technology-driven, the future of transportation is evolving at a rapid pace. The limitations are, in fact, not the autonomous vehicles and technology, as much as the regulations that need to be put into place.

In that regard, federal regulators plan to issue guidance within months on preferred performance characteristics and testing methods for driverless vehicles and collaborate with state officials on policies. And, the federal government has proposed to spend $4 billion to encourage developing driverless vehicles.

While researchers began building autonomous vehicles that could be tested on public roads, the concept evolved into Connected Autonomous Vehicles (CAVs) which can communicate with each other, and communicate with infrastructure, much more efficiently and as fast as the human brain can respond.

CAVs, once fully implemented, have the potential to improve our way of life. Among the numerous benefits are:

- Improving safety by reducing the number of crashes that occur annually on our roadways; and,

- Reducing:
  - ✓ traffic congestion;
  - ✓ speeding;
  - ✓ emissions/pollution;

- ✓ impaired driving;
- ✓ texting-while driving; and,
- ✓ road rage.

In addition to these transportation system improvements, CAVs also have the potential to improve daily living, particularly for seniors and the disabled. Concerns like: *"How will I get to the grocery store or the doctor or just get out of the house because you can no longer safely operate a moving vehicle"* can be addressed.

To meet these needs today, there are the Older Adults Services transportation program, taxicabs, Uber, and Lyft. In the next several years, there will also be CAVs. Government support of this technology, could be the catalyst for funding a mass transit system that includes a fleet of CAVs. The federal government has been receptive and willing to embrace CAVs because of their social benefits. Providing an alternative to bus/van and other transit modes/vehicles will help encourage more government funding to make CAVs a reality for public use. Concern about loss of revenue from existing transportation systems is on the opposite side of this discussion. But, as explained in the article: *Autonomous vehicles will have tremendous impacts on government revenue*,[4] there is a potential for significant cost savings to governments compared to the loss of revenue.

Consider, that If you do not possess the ability to operate an auto, how transformative it could it be for a vehicle to come to you, on demand, and provide travel, with comfort, safety, and security?

6. Funding Situation

6.1 State and Federal Programs

After years of frustration at the federal and state levels, both governments enacted transportation funding legislation in 2015. The state program doesn't begin to provide monies until January 1, 2017; it then takes until fiscal year 2020 for the full effect (estimated to be $1.234 billion per year) to be felt. Those funds are to be distributed 696 ways: MDOT, 80 transit agencies, 83 counties, and 533 villages and cities.

At the federal level, the FAST Act (Fixing America's Surface Transportation) will provide five years (FY 2016 through FY 2020) of funding certainty. For Michigan, that represents $1.02 billion in the first fiscal year and $1.17 billion in FY 2020 (Figure 17). This is about $52 million (5.1%) of net new money in 2016 versus 2015 and, then, about $20 to $25 million (about 2.25%, on average) of net new money each year after. When combined with state funding, cities in Michigan can expect $66.4 million in FY 2017, when additional Michigan funding begins to flow. That will grow to $186 million in FY 2020 (Figure 18). It must be kept in mind this funding for citie/villages will be divided 533 ways. Novi is the 27th largest city in Michigan with about 1% of the total city/village population.

It is also important to recognize that these funds are to be allocated overwhelmingly to routine maintenance and preservation of existing roads (Figure 19). A relatively small amount will be available for projects that will increase capacity.

6.2 Novi Funding

The City of Novi annually spends approximately $11.5 million on roadway capital improvements and another $3 million on maintenance.

Novi's projected sidewalks/pathways program for the five fiscal years ending in FY 2020, totals $11.4 million, all but $733,000 to come from the Municipal Street or Major Road Funds. Phase II of the M5/I-275 Regional Trail Connection is the project for which $733,000 is needed from local/Novi funds.

The Older Adults Services transportation program is supported by several sources, including non-government donations, advertising and fare revenue.

[4] Kevin C. Desouza, Nonresident Senior Fellow, Governance Studies, Center for Technology Innovation; Kena Fedorschak, MBA candidate, W.P. Carey School of Business, Arizona State University

Figure 17. Federal Funding for Michigan

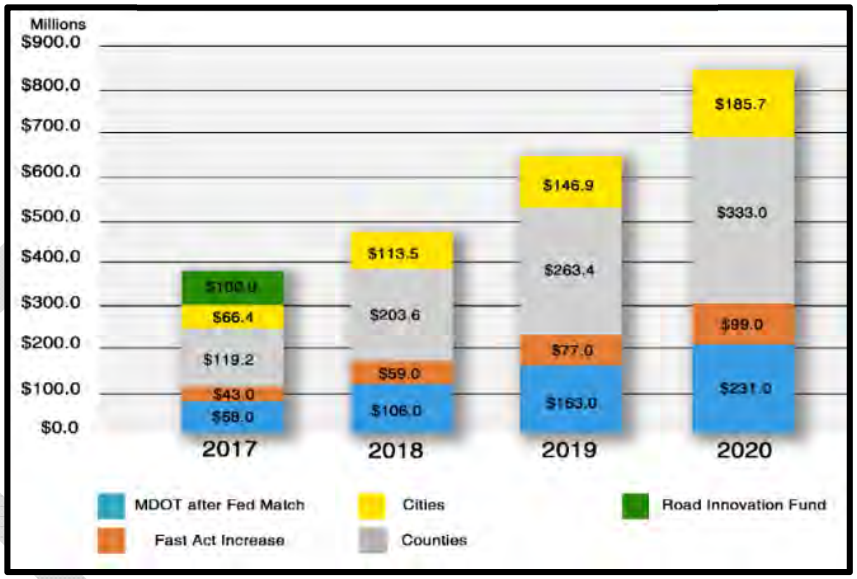
FAST Act – Michigan Funding

(Millions)	Map-21	FAST Act				
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Total Highway Funding	$1,016	$1,068	$1,090	$1,114	$1,139	$1,166
Increase From Prior Year	0.0%	5.1%	2.2%	2.2%	2.2%	2.4%

Source: MDOT

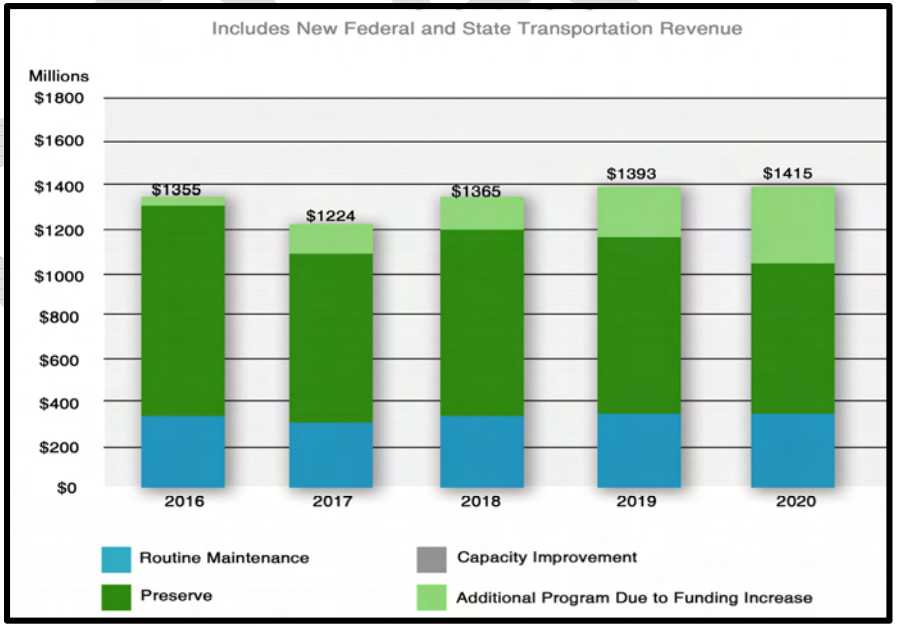
Source: NTH Consultants, Ltd. Webinar Slides

Figure 18. Increased Transportation Revenues



Source: NTH Consultants, Ltd. Webinar Slides

Figure 19. Michigan Highway Program Investment by Category, FY 2016 to 2020



Source: NTH Consultants, Ltd. Webinar Slides

7. Recommendations

In preparing recommendations (Table 10) for the Novi Thoroughfare Master Plan, the City's "Complete Streets" policy, adopted in 2010, has been an underlying principle. "Complete Streets" are key to creating healthy, active communities. The City's policy recognizes that streets serve multiple purposes and they must be designed to balance the needs of all transportation users. The preliminary recommendations cited here recognize the need to involve multiple uses, including safe, active and ample space for pedestrians, bicyclists and transit riders. Working with the Steering Committee, a practical set of improvements has been selected for the road, intersection, non-motorized, and transit projects to be implemented.

7.1 Roads

Widening Beck and 10 Mile Roads is likely to cost $21.5 million and $19.8 million, respectively. Assuming these are done sequentially over the period FY 2017-2025, inclusive, they represent a small portion of the total federal and state funds available to Michigan cities and villages. The consultant believes this program is aggressive, but achievable.

The widening plan for Beck Road is summarized on Table 11, and illustrated in the appendix to this report. It should be noted the $21.5 million cost is for only the section in Novi. The remaining section north to Pontiac Trail will be the responsibility of Wixom. Likewise, possible environmental impacts are presented only for Beck Road in Novi. But, optimal return on Novi's investment will only be achieved if the section in Wixom is improved. The concept for 10 Mile Road is a five-lane section with curb, gutter, and sidewalk.

There are other potential capacity improvements needed to Meadowbrook and Grand River Avenue. However, because the funding picture is unclear, those projects are in the "beyond 2025" timeframe. In the more-immediate future, improvements to intersections along these roads can be addressed as discussed in Section 7.2.

7.1.1 Potential Impacts of Road Widening

The potential environmental impacts related to the widening of Beck Road, between 8 Mile Road and just south of Grand River Avenue, plus 10 Mile Road, between Taft Road and Haggerty Road, are summarized in Table 12.

Wetlands are widespread in Novi, especially in the western portion of the city. The basic rules related to wetlands are: if they can't be avoided, then their use must be minimized. If their use can't be minimized, then the impact must be mitigated. Usually, mitigation means replacement of more than two acres of wetland for every acre used, because the replacement wetlands do not always function as designed. Taken together, the widening of Beck and 10 Mile Roads would likely affect 2.5 acres of wetland. The Novi total includes the pond on the south side of 10 Mile Road east of Pheasant Run.

Protecting *floodplains and floodways* is to address risks to structures and property by preventing obstructions that would increase flooding. Occupation of a floodplain generally requires demonstrating how flooding risk will be avoided under permitting by the Michigan Department of Environmental Quality. For Beck Road, about 0.2 acres of floodplain are affected; it is 0.6 affected acres along 10 Mile Road.

There are regulations to protect natural streams to ensure proper drainage. Widening of Beck Road in Novi is expected to affect about one-half mile of streams. Widening of 10 Mile Road is likely to impact about 950 feet. Proper design must address the impacts.

Historic Church

The church on the west side of Beck Road 600 feet south of 10 Mile Road is the only known designated historic site potentially affected. The Novi Historical Society notes the church was established in 1875 on Grand River Boulevard, west of Novi Road. It was closed for some years starting in the 1920s. In 1997 the church was moved to Beck Road. It would not be affected by the widening of Beck, but its presence is noted. It would not ordinarily be considered eligible for the *National Register of Historic Places* because it has been moved. However, if it were to be considered "eligible," it would be subject to the regulations promulgated under the National Historic Preservation Act which require certain kinds of protection.

Table 10. Novi Thoroughfare Master Plan Recommendations

Widening/Capacity Improvement		Estimated Cost[1]	Implementation Period
Beck Road	8 Mile Road to Grand River Avenue	$21.5 million	FY 2017–2021
–Segment A	–8 Mile Road to 9 Mile Road	$6.3 million	FY 2017–2018
–Segment B	–9 Mile Road to 10 Mile Road	$5.6 million	FY 2018–2019
–Segment C	–10 Mile Road to 11 Mile Road	$6.3 million	FY 2019–2020
–Segment D	–11 Mile Road to Grand River Avenue	$3.3 million	FY 2020–2021
10 Mile Road	Haggerty Road to Taft Road	$19.8 million	FY 2021–2025
Meadowbrook Road	10 Mile Road to 12 Mile Road	TBD	After 2025
Grand River Avenue	Novi Road to Haggerty Road	TBD	After 2025
Novi Road	9 Mile Road to 10 Mile Road	TBD	After 2025

Intersection Improvements	Estimated Cost	Time Frame
Beck Road at 10 Mile Road	$750,000	See footnote 2
Beck Road at I-96 Ramps	$300,000	See footnote 2
Beck Road at Grand River Avenue	$750,000	In progress
West Park Drive at 12 Mile Road	$215,000	FY 2019–20
West Park Drive at South Lake Drive	$175,000	FY 2019–20
Novi Road at 10 Mile Road	$75,000	FY 2018–19
Novi Road at Grand River Avenue	$3,250,000	FY 2018–19
Novi Road at 12 Mile Road	$10,000	FY 2018–19
Meadowbrook at 13 Mile Road	$200,000	FY 2018–19
Haggerty Road 8 Mile Road	$5,000	FY 2016–17
Haggerty Road at 12 Mile Road	$35,000	FY 2016–17
Haggerty Road at 14 Mile Road	$40,000	FY 2016–17
M5 at 14 Mile Road	$3,000	FY 2016–17

Sidewalks and Pathways	Segment	Estimated Cost	Time Frame
South side of 10 Mile Road	Meadowbrook to Haggerty	$745,000	FY 2019–22
South side of Pontiac Trail	Beck to West park	$490,000	FY 2017–19
West side of Haggerty Road	8 Mile to High Pointe	$295,000	FY 2019–20
North side of 10 Mile road	Eaton Center to Churchill Crossing	$175,000	FY 2018–19
West side of Beck Road	11 Mile to Providence	$185,000	FY 2018–19
North side of 9 Mile Road	Novi Road to Taft	$415,000	FY 2018–21
South side of 10 Mile Road	Novi Road to Chipmunk Trail	$345,000	FY 2019–20
East side of Meadowbrook Road	8 Mile to 9 Mile	$490,000	FY 2019–22
East side of Meadowbrook Road	9 Mile to 10 Mile	$615,000	FY 2019–22
West side of Meadowbrook Road	11 Mile to Gateway Village	$450,000	FY 2019–20
South side of 14 Mile Road	Beach Walk to East Lake	$95,000	FY 2016–17

Transit	Service	Estimated Cost	Time Frame
Older Adult Services Transportation	Continuation of Current Service	$160,000/year	Ongoing
Novi Mall Circulator	Six-month demonstration	$45,000	FY 2017

[1] *2016 dollars*
[2] *To be coordinated with widening Beck Road*
Source: The Corradino Group of Michigan, Inc.

Table 11. Proposed Beck Road Improvement Cross Section and Cost Summary

Segment	Length	Existing Section	Proposed Section	Parcels Affected	Estimate (2016)
8 Mile Road to 9 Mile Road	1 Mile	2 Lanes	5 Lanes	28	$6,293,100
9 Mile Road to 10 Mile Road	1 Mile	2 Lanes	5 Lanes/4 Lane Boulevard	18	$5,564,800
10 Mile Road to 11 Mile Road	1 Mile	2 Lanes	5 Lanes/4 Lane Boulevard	6	$6,315,400
11 Mile Road to Grand River Avenue	0.45 Miles	3 Lanes	5 Lanes	13	$3,323,200
TOTAL	3.45 Miles			65	$ 21,496,500

Source: The Corradino Group of Michigan, Inc.

Table 12. Summary of Potential Environmental Impacts of Widening Beck Road and 10 Mile Road

	Beck Road, 8 Mile to Grand River*	10 Mile Road, Taft to Haggerty
Wetlands (acres)	1.7	0.8
Floodplains – Zone AE (acres)	0.2	0.6
Streams (in linear feet)	2,636	938
Historical Resources	None	None
Parkland	None	0.6 acres of Fuerst Park
Relocations	None	1 Vacant Single Family
Land Use (acres):		
Commercial/Office	0.8	1.6
Single Family	3.3	0.5
Multiple Family	0.5	0.6
Industrial	0.0	0.7
Railroad	0.0	0.3
Public/Institutional	1.4	0.9
Recreation/Conservation	0.8	1.2
Vacant	2.7	1.5
Water	0.1	0.1
Total Acres	9.6	7.4
Threatened/Endangered Species	See text	See text
Potential Contamination	See text	See text

** Novi values are based on the city's GIS system*
*** Wixom's values are based on mapping available on their Web site*

Source: City of Novi GIS and The Corradino Group of Michigan, Inc.

A small sliver of Fuerst Park, which is part of Novi's Civic Center complex at the southeast corner of Taft and 10 Mile Roads, would be required for the widening of 10 Mile Road. Some roadway widening has already occurred there with previous intersection work. Nonetheless, the use of this land will likely be subject to Section 4(f) of the National Transportation Act, which was written to protect conversion of parkland to transportation uses. Because the city controls the property, and it was not developed with money from the Land and Water Conservation Fund (Section 6[f]) of the National Parks Service, problems are not anticipated, as long as the necessary procedural steps are followed.

One vacant single-family residence, north of 10 Mile Road at the intersection with Beck Road would be affected. The home and land are now owned by Providence Hospital. About 3.3 acres of residential land abutting the right-of-way would likely be used to widen Beck Road in Novi, an acre in Wixom, and one-half acre along 10 Mile Road.

Property acquisitions are mainly strips of land along each road. Sometimes the city owns the land between the road and the newer sidewalks and sometimes not.

If federal funds are used, it is expected that widening Beck Road will be subject to noise analysis when the environmental clearance document is prepared. There are areas along Beck Road where clusters of homes have direct exposure to noise from Beck Road. These areas should be reviewed in evaluating noise abatement.

A review of threatened and endangered species[5] finds the Eastern Mississauga rattlesnake (*Sistrurus catenatus*) (proposed as a federal threatened species) is found in Oakland County (records are kept by county). Experts will look for evidence of this snake during design. Both road projects are within the range of the Indiana bat (*Myotis sodalis*) (endangered) and northern long-eared bat (*Myotis septentrionalis*) (threatened), both of which have suffered catastrophic losses due to white-nose syndrome. Experts will have to determine during roadway design if evidence exists of the presence of either of these species.

The Poweshiek skipperling butterfly (*Oarisma poweshiek*) (endangered) is found in Oakland County, but its specific habitats are not near the project. As with the bats, coordination will have to occur with U.S. Fish & Wildlife Services, at the time the projects are designed.

Poweshiek Skipperling Butterfly

A contaminated site along the Beck and 10 Mile Road corridors would be a leaking underground storage tank (LUST) that has not been completely remediated. A review of the Michigan Department of Environmental Quality (MDEQ)/Licensing and Regulatory Affairs (LARA) Web site[4] indicates there is one such site – Sovel's Service Center – at 41425 W 10 Mile Road. The status of the LUST will need to be checked during roadway design.

During the environmental review phase of project design, a records check and "walkover" will likely be conducted to make sure there are no former uses of contaminating materials, including agricultural pesticides and herbicides.

In summary, these environmental issues are within the normal range for a roadway widening project in an urban setting.

7.2 Intersections

Crash data were received from the Traffic Improvement Association of Michigan (TIA) for the 50 intersections in Novi with the highest crash frequencies. A majority of these intersections are under the jurisdiction of the RCOC and MDOT. The results of analyzing these data for 2012–2014 were compared with those in the January, 2012, Birchler Arroyo Associates report titled: *Crash-Data-Assisted Safety Evaluation of 12 Intersections in the City of Novi.*

For the Thoroughfare Master Plan, Corradino used an approach that examines crash rates per million vehicles entering the intersection. Additionally, a *Severity Index* was calculated for each intersection. The index weights fatal crashes with a factor of 12, injury crashes with a factor of three, and non-injury

[5] http://www.fws.gov/midwest/endangered/lists/michigan-cty.html

crashes with a factor of one, then averages the total. While judgement, based on experience, was used to establish these factors, the overall approach is that found in the Federal Highway Administration Road Safety Information Analysis on their website.

Birchler Arroyo Associates' (BAA) report identified ten Novi intersections with the highest crash rates or casualty ratios (2006 thru 2010 data). In June, 2012, that analysis was advanced to identify significant crash patterns, possible causes and countermeasures, based on field inspection and the SEMCOG *Traffic Safety Manual*.

With the data provided by TIA, all ten BAA Novi intersections were confirmed by Corradino as candidates for crash countermeasures. Those intersections are:

1. Beck Road at Grand River Avenue;
2. Novi Road at Grand River Avenue;
3. 8 Mile Road at Haggerty Road;
4. Novi Road at 10 Mile Road;
5. 12 Mile Road at Novi Road;
6. 12 Mile Road at Haggerty Road;
7. 14 Mile Road at M5;
8. 14 Mile Road at Haggerty Road;

The results of the Corradino analysis indicated two intersections with a high crash rate to be added to the list:

- Beck Road at the I-96 interchange ramps; and,
- Beck Road at 10 Mile Road.

The Corradino analysis also found one intersection with a high *Severity Index* which is added the list. While this intersection may not have a particularly high number of crashes or crash rate, the crashes that occur are of a significant nature.

- 12 Mile Road at West Park Drive.

During the course of the study, two more intersections, which are under the jurisdiction of the City of Novi, were added to the analysis:

- Meadowbrook Road at 13 Mile Road; and,
- West Park Drive at South Lake Drive.

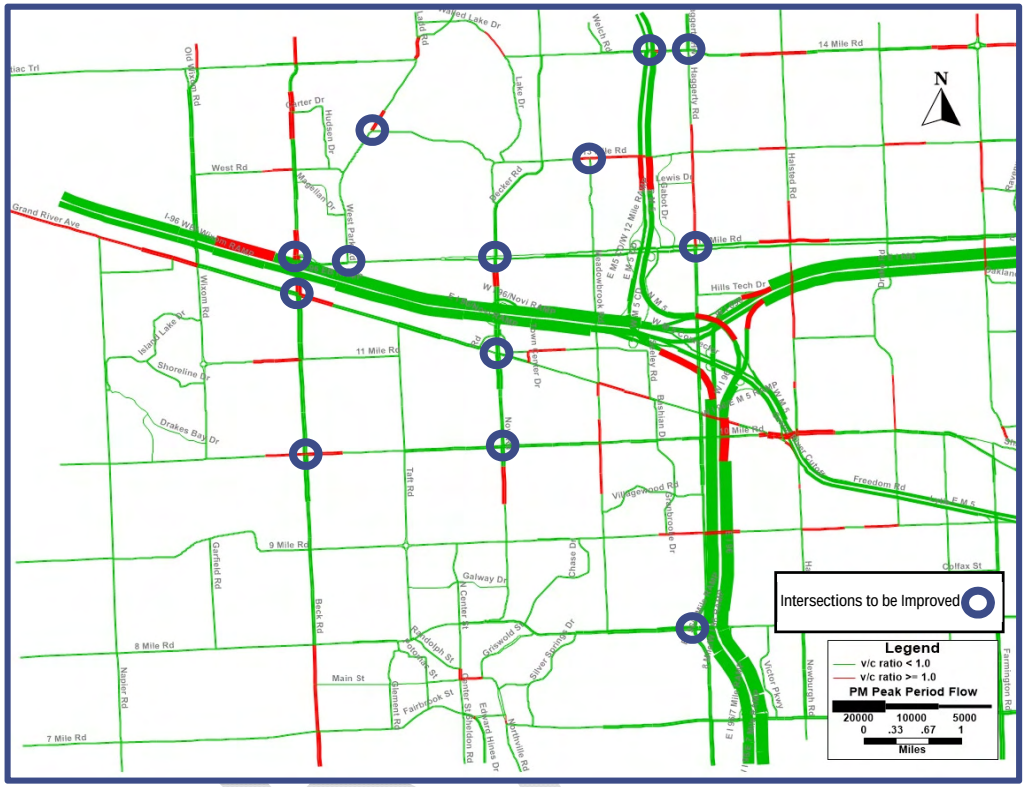
Proposed corrective actions for these intersections are presented next. In this discussion, reference will be made to "Level-of-Service" and "volume-to-capacity" ratios.

Level-of-Service (LOS) is a qualitative measure used to relate the quality of traffic service. LOS categorizes traffic flow and assigns quality levels based on performance measures like speed, density, etc. The letters "A" through "F" are reported, with A being the best and F the worst. A summary of the LOS letter grades is provided in Table 14.

The Volume-to-Capacity (V/C) ratio provides a quantitative assessment of how well traffic movements are accommodated. A V/C above one demonstrates that the traffic demand is greater than the facility's capacity. The demand will not be served, and long queues are likely to form. An emphasis of the proposed improvements was to achieve V/C less than one at the intersections studied.

It is important to note that, while there are funding, impact, and policy constraints that prevent more road widenings than Beck and 10 Mile Roads, the following proposals for the locations circled on Figure 20, and listed on Table 13, will address much of this congestion in a cost-effective way.

Figure 20. Novi Intersections Proposed to be Improved



Source: The Corradino Group of Michigan, Inc.

Table 13. Level-of-Service Descriptions

A:	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B:	Reasonable free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is still high.
C:	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.
D:	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E:	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F:	Breakdowns in traffic flow. The number of vehicles entering the highway section exceed the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: The Highway Capacity Manual and The Corradino Group of Michigan, Inc.

7.2.1 Beck Road at 10 Mile Road

Each approach to this signalized intersection (Figure 21) includes one through-lane, one left-turn lane and one right-turn lane. There were 89 crashes at this location in 2012, 2013, and 2014, combined. The crash rate of the intersection is 2.46 crashes per million entering vehicles; equal to the highest rate of the intersections being analyzed. Twenty-five percent were injury crashes. The majority of the crashes were rear-end (62%), during the afternoon peak hours, in clear weather (71%), and on dry pavement (79%). Based on these characteristics, congestion appears to be a leading factor in the crashes. That will be addressed with the Beck Road widening.

In the near term, proposed countermeasures to be implemented at minimum costs are:

- Investigate retiming the signal to mitigate congested conditions and long queues;
- Place advance warning signs on all four approaches to the intersection. The preferred warning sign is a *"Be Prepared to Stop"* with a *"When Flashing"* supplemental plaque and a flashing beacon that is interconnected with the signal;
- As an alternate to the sign assembly noted above, a *"Signal Ahead"* sign could be placed on each approach; and,
- Maintain/renew the pavement markings on all four approaches to the intersection.

Figure 21. Beck Road at 10 Mile Road

It is recommended in conjunction with widening Beck Road that westbound 10 Mile Road, departing from Beck Road, be widened for a minimum distance of 0.25 miles (Figure 22). This will allow motorists to use both lanes through the signal and have adequate time to merge into a single lane west of the intersection. Also, westbound 10 Mile Road, approaching Beck Road, should be re-striped so that the existing exclusive right-turn lane becomes a shared through/right-turn lane. This will create additional capacity by taking advantage of the widened portion of westbound 10 Mile Road west of Beck Road.

Figure 22. Beck Road at 10 Mile Road

Source: Google Earth and The Corradino Group of Michigan, Inc.

In combination with widening Beck Road, the recommended improvements to 10 Mile Road at this location will maintain the overall LOS of the intersection in the year 2040 at D (Table 14). The LOS of the westbound and southbound approaches will be improved from D to C. No approach movement

Table 14. 2040 PM Existing and Proposed LOS, Beck Road at 10 Mile Road

Primary Road	Cross Road	Criterion	2040 Existing Geometry				2040 Proposed Geometry			
			EB	WB	NB	SB	EB	WB	NB	SB
Beck	10 Mile	Approach LOS	D	D	D	D	D	C	D	C
		Intersection LOS	D				D			
		Max. V/C Ratio	1.01				0.94			

will have a V/C over 1.0 (Table 15). The improvements are estimated to cost $750,000, if done separately from widening Beck Road.

7.2.2 Beck Road at Grand River Avenue

The proposed Beck Road widening will be to a five-lane section of Beck just south of its intersection with Grand River Avenue. To address the congestion issues at the intersection, improvements now underway are to restripe the existing median pavement along northbound Beck Road approaching Grand River Avenue to create an additional left-turn lane. This will create a double left-turn lane (Figure 23). Also, an additional left-turn lane is being constructed along eastbound Grand River Avenue approaching Beck Road to create a double left-turn lane.

Table 15. 2040 PM Existing and Proposed V/C>1.0, Beck Road at 10 Mile Road

	Ten Mile Road						Beck Road					
	Eastbound			Westbound			Northbound			Southbound		
	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.
Existing							X					
Proposed												

Source: The Corradino Group of Michigan, Inc.

The latter improvements will improve the LOS of the intersection in the year 2040 from E to D (Table 16). No approach movement will have an LOS worse than D or a V/C over one (Table 17).

The city's 2014–2020 Capital Improvement Program calls for these improvements, estimated to cost approximately $680,000. It is conservatively estimated that the signing, striping, and signal modification to modify the northbound approach to a double left-turn lane will cost approximately $100,000. Therefore, the combined improvements are estimated to cost $780,000.

Figure 23. Beck Road at Grand River Avenue Aerial Imagery

Source: Google Earth and The Corradino Group of Michigan, Inc.

Table 16. 2040 PM Existing and Proposed LOS, Beck Road at Grand River Avenue

Primary Road	Cross Road	Criterion	2040 Existing Geometry				2040 Proposed Geometry			
			EB	WB	NB	SB	EB	WB	NB	SB
Beck	Grand River	Approach LOS	E	F	E	D	D	D	D	C
		Intersection LOS	E				D			
		Max. V/C ratio	1.22				0.96			

Source: The Corradino Group of Michigan, Inc.

Table 17. 2040 PM Existing and Proposed V/C>1.0, Beck Road at Grand River Avenue

	Grand River Avenue						Beck Road					
	Eastbound			Westbound			Northbound			Southbound		
	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.	Lt.	Tr.	Rt.
Existing	X			X	X	X	X	X				
Proposed												

7.2.3 Beck Road at I-96 Ramps

Beck Road at I-96 (Figure 24) is a signalized, single-point urban interchange (SPUI). There were 109 crashes at this location in 2012, 2013, and 2014, combined. The crash rate of the intersection is 2.46 crashes per million entering vehicles, matching the highest crash rate of the intersections being analyzed. Eleven percent were injury crashes. The majority of the crashes were of the rear-end type (75%), during the morning and afternoon peak hours, in clear or cloudy weather conditions (87%), and on dry pavement (81%). Based on these characteristics, congestion appears to be a leading factor in the crashes. The proposed countermeasures, estimated to cost $300,000 and to be implemented with widening Beck, include:

- Place an advance-warning sign on the southbound Beck Road approach to the I-96 interchange. The preferred warning sign is a *"Be Prepared to Stop"* with a *"When Flashing"* supplemental plaque and a flashing beacon that is interconnected with the signal;
- As an alternate to the sign assembly noted above, a *"Signal Ahead"* sign could be placed on the southbound approach;
- Replace the existing span-wire signal configuration with a mast-arm configuration to improve the visibility of the signal heads;
- Maintain/renew the pavement markings within the interchange; and,
- Investigate retiming the signal to mitigate congested conditions and long queues.

Figure 24. Beck Road at I-96 Interchange

7.2.4 West Park Drive at 12 Mile Road

The east and west legs of this intersection (Figure 25) are 12 Mile Road and the north leg is West Park Drive. A private drive is the south leg. The eastbound and westbound approaches of 12 Mile Road include one through-lane, one left-turn lane and one right-turn lane. The southbound approach of West Park Drive includes a shared through/right-turn lane and a left-turn lane. The northbound approach of the private drive includes a shared through/right-turn lane and a left-turn lane.

There were 26 crashes at this location in 2012, 2013, and 2014, combined. The crash rate of the intersection is 1.25 crashes per million entering vehicles. Half were injury crashes. The majority were of the rear-end type (54%), during the afternoon peak hours (69%), in clear or cloudy weather conditions (76%), and on dry pavement (73%). Congestion appears to be a leading factor in the crashes. Proposed countermeasures, estimated at $215,000 and to be implemented during the period FY 2019–2020, include:

- Replace the existing span-wire signal configuration with a mast-arm configuration to improve the visibility of the signal heads;
- Investigate retiming the signal to mitigate congested conditions and long queues;
- Place advance-warning signs on the Twelve Mile Road and West Park Drive approaches to the intersection. The preferred warning sign is a "Be Prepared to Stop" with a "When Flashing" supplemental plaque and a flashing beacon that is interconnected with the signal;
- As an alternate to the sign assembly noted above, a "Signal Ahead" sign could be placed on each approach listed; and,
- Maintain/renew the pavement markings on all three public road approaches to the intersection.

Figure 25. W Park Drive at 12 Mile Road

7.2.5 West Park Drive at South Lake Drive

At this intersection (Figure 26), West Park Drive has three lanes on each approach – one dedicated to left-turning vehicles, one for right-turning vehicles, and a through lane. The South Lake Drive westbound approach to the intersection also has three lanes – one for left turns, one for right turns, and a through lane. There were four crashes at this location causing a crash rate of 0.32 per million vehicles entering the intersection. All four crashes involved injuries. Two of the four crashes were of the rear-end type. The crashes were distributed through the day and most occurred during clear weather on dry pavement.

To address this experience, it is recommended that the signal system be upgraded to current standards with improvements to technology since the signal was installed in 1999. The signal system upgrade is programmed in the Novi FY 2015–2021 Capital Improvement Plan. The estimated construction cost of the improvements in the CIP is $175,000 with implementation during the period FY 2019–2020.

Figure 26. West Park Drive at South Lake Drive

7.2.6 Novi Road at 10 Mile Road

This intersection (Figure 27) is another heavily-commercial location. The northbound Novi Road approach has three lanes: one for left-turning vehicles; one for vehicles turning right; and, the third for through traffic. The southbound approach is configured in the same way. The two approaches on 10 Mile Road each have a left-turn lane, a lane dedicated to through traffic, and a third lane for vehicles turning right or moving through the intersection. There were 96 crashes in the three years ending in 2014. The crash rate was 2.27 per million vehicles entering the intersection. Crashes were 22% injury and 43% rear-end. As at the other inter-sections, most crashes happened in clear or cloudy weather on dry pavement.

The crash countermeasures proposed for this intersection are:

- Add right-turn lane on southbound Novi Road; and,
- Enhance crosswalks.

The consultant estimates the cost of these measure at $75,000 with implementation during FY 2018-2019.

Figure 27. Novi Road at 10 Mile Road

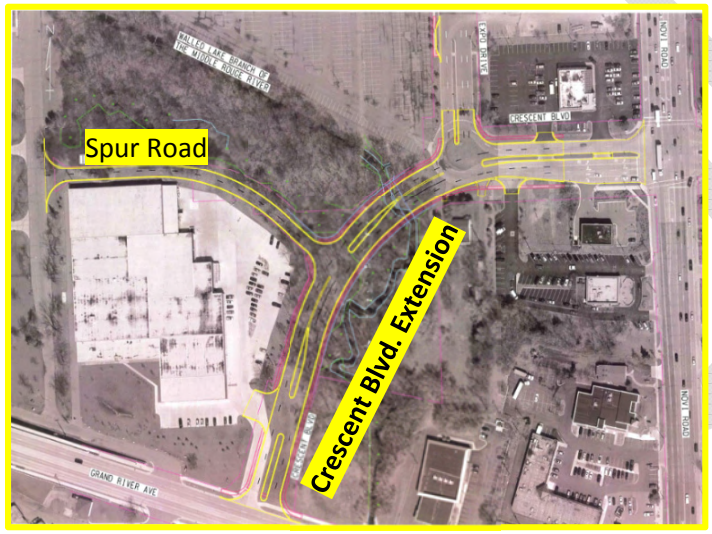
7.2.7 Novi Road at Grand River Avenue

Significant commercial development is located at and constrains the edges of this intersection (Figure 28). Both of the Novi Road's approaches are configured with a left-turn lane, a center/through lane and a shared right-turn and through vehicle lane. Westbound Grand River Avenue has two through lanes, and exclusive left- and right-turn lanes. The eastbound approach has three lanes with an exclusive left-turn lane and a center through lane plus a through-plus-right-turn lane.

There were 108 crashes at this location in the 2012–2014 period. The rate was 2.10 crashes per million vehicles entering the intersection; two-thirds, were rear-end collisions.

Figure 28. Novi Road at Grand River Avenue

Figure 28a. Novi Road at Grand River Avenue



To counter the crash experience, the following measures are offered:

- Extend Crescent Boulevard west to Grand River Avenue, plus build a "spur road" on the north side of the intersection;
- Enhance the crosswalks.

The cost of these measures is estimated by the consultant at $3,250,000. The bulk of this cost ($3,200,000) is associated with the proposed extension of Crescent Boulevard plus a "spur" around the industrial building at the northwest corner of the extension of Crescent Boulevard to Grand River Avenue (Figure 28a).

7.2.8 Novi Road at 12 Mile Road

The northbound approach of Novi Road at this location (Figure 29) has an exclusive right-turn lane, a through lane, and a through-plus-left-turn lane. Twelve Mile Road has a grass median at this location. Vehicles turning left do so before the intersection on each 12 Mile Road approach. Vehicles turning right have an exclusive lane for that maneuver. Two lanes on each 12 Mile Road intersection approach are for through vehicles.

The crash rate at this location is 2.42 crashes per million vehicles entering the intersection which is the second highest among the intersections analyzed. Twenty-three percent of crashes involved injuries, with over half (51%) being rear-end. Most were during clear or cloudy weather on dry pavement.

Based on these characteristics, crash counter measures to be considered are:

- Provide for a pedestrian refuge on each of the crossings of Novi Road; and,
- Enhance the crosswalk markings.

The consultant's cost estimate for these measures is $10,000. Implementation is for the period FY 2016-2017.

Figure 29. Novi Road at 12 Mile Road

7.2.9 Meadowbrook Road at 13 Mile Road

Meadowbrook Road at this location forms a T-intersection with 13 Mile Road (Figure 30). One lane is for left-turning vehicles, the other is an exclusive right-turn lane. The 13 Mile Road westbound intersection approach has one lane exclusively for left turns to Meadowbrook and another for through movements. The eastbound approach has an exclusive right-turn lane and a through lane. There were 11 crashes at this location causing a crash rate of 0.88 per million vehicles entering the intersection. Only one crash involved injuries. In almost all cases, the weather was clear, with the crashes spread throughout the day.

To improve the intersection:

- Signal heads should be installed on mast arms instead of span wire;
- Back plates with retro-reflective borders should be placed around the signal heads;
- Vehicle detection should be improved; and,
- Signing and striping should be improved.

The recommended signal system upgrade will improve the safety and operations of the intersection by improving the signal's visibility. The cost of these improvements is estimated at $200,000 with implementation during FY 2018-2019.

Figure 30. Meadowbrook Road at 13 Mile Road

7.2.10 Haggerty Road at 8 Mile Road

This intersection (Figure 31) was the site of 134 crashes from 2012 to 2014, inclusive. The crash rate was 2.07 crashes per million vehicles entering the intersection.

Northbound Haggerty Road at this location is four lanes wide: two through lanes plus one exclusive lane for left-turning vehicles and another for right-turning vehicles. The southbound approach is three lanes wide: one exclusive left-turn lane, a center/through lane, and a curb lane for through plus right-turning vehicles.

The eastbound and westbound approaches are four lanes: two center/through lanes and exclusive lanes for left turns and right turns.

Twenty-nine percent of crashes involved injuries. Rear-end crashes were most common (48%), and occurred during the noon hour and afternoon peak, in clear or cloudy weather, on dry pavement.

In order to develop measures to counter this crash experience, the following is proposed:

- Add left-turn traffic signal phases on all four approaches; and,
- Improve transverse (cross-intersection) markings.

These measures are estimated to cost $5,000 with implementation during 2016-2017.

Figure 31. Haggerty Road at 8 Mile Road

7.2.11 Haggerty Road at 12 Mile Road

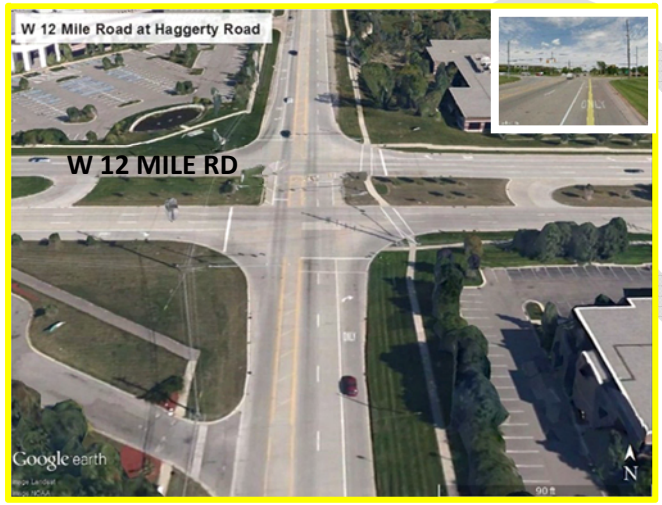
At this sprawling intersection (Figure 32), 12 Mile Road has a grass median. Left turns to Haggerty Road are made prior to the intersection. One lane on each approach is for right-turning vehicles. The two remaining lanes are for through traffic. The Haggerty Road northbound approach to the intersection has three lanes. One is dedicated to right turns. The two remaining lanes are for through traffic. On Haggerty's southbound approach, there are two lanes: one for right-turning vehicles and the other for through traffic.

Seventy-six crashes occurred at this location in the three-year period 2012–2014, inclusive. The crash rate was 1.50 crashes per million entering vehicles. A very high percentage of crashes at this location involved injuries (76%) including one fatality. The leading crash type was rear-end (64%), during clear or cloudy weather on dry pavement. The crash countermeasures proposed for this intersection are:

- Remove shrubbery and prune trees in the median;
- Extend sidewalk on west side of Haggerty Road; and,
- Conduct a speed study on 12 Mile Road, and adjust speed limit accordingly.

Implementation is proposed in FY 2016-2017 at a cost of $35,000.

Figure 32. Haggerty Road at 12 Mile Road



7.2.12 Haggerty Road at 14 Mile Road

This intersection (Figure 33) is located in a highly-commercial area. The northbound Haggerty Road approach to the intersection has exclusive left-turn and right-turn lanes plus one through-lane. Southbound, Haggerty Road has one exclusive left-turn lane and a lane for both through and right-turning vehicles.

Fourteen Mile Road has, on each approach to Haggerty Road, exclusive left-turn and right-turn lanes with one lane for vehicles moving straight through the intersection. From 2011 to, and including, 2014, there were 86 crashes at this location causing a crash rate of 2.23 crashes per million vehicles entering the intersection, among the highest of the crash rates. Rear-end crashes were most common (41%), followed by angle crashes (26%). Crashes were most common at noon and in the afternoon peak hours, in clear or cloudy weather (82%), and on dry pavement (77%).

Based on these characteristics, the crash countermeasures proposed here are:

- Develop an access management plan to coordinate vehicles entering/leaving the land uses in the corners of the intersection;
- Prohibit "right-turn-on-red" on the westbound 14 Mile Road approach;
- Place a sidewalk around the northwest corner; and,

Implementing these items in FY 2016-2017 is estimated to cost $40,000.

Figure 33. Haggerty Road at 14 Mile Road

7.2.13 M5 at 14 Mile Road

This is a signal-controlled intersection (Figure 34). Both the eastbound and westbound approaches of 14 Mile Road have one dedicated left-turn lane, one dedicated right-turn lane and a lane for both through and right-turning vehicles. M5 has a lane reserved for vehicles turning right and four through lanes. Left-turns are made by the "Michigan-left" maneuver. There were 130 crashes at this intersection in the three-year period of 2012–2014. The crash rate was 1.25 crashes per million vehicles entering the intersection, with rear-end crashes the most common (69%). Crashes were spread through the afternoon hours in clear or cloudy weather on dry pavement. Based on these characteristics, proposed measures to counter this crash experience are:

- Place advance warning *"Signal Ahead"* signs on the M5 approaches to the intersection;
- Place *"Turning Vehicles Yield to Pedestrian"* signs on the westbound 14 Mile Road approach and the southbound M5 approach to the intersection; and,
- Re-evaluate signal timing.

Figure 34. M5 at 14 Mile Road

Making these changes in 2016-2017 is estimated to cost $3,000.

7.2.14 Other Intersections

Analysis of the Beck Road at 9 Mile Road improvements demonstrated that this intersection will operate at an adequate level of service for the reasonable future. It is programmed in the Novi FY 2015–2021 Capital Improvement Plan to be improved with new equipment reflecting updated standards and improved technology that has changed since the original installation in 1998. The estimated cost of the improvements is $215,000. This includes engineering, along with an improved street light, pedestrian signals, and sidewalks.

Analysis of the Beck Road at 11 Mile Road intersection indicates it will also operate at an adequate level of service. Investment would be better served at other intersections.

7.3 Sidewalks and Pathways

Table 7 defines the sidewalk and pathway improvements scheduled over the period FY 2017–2022. The cost estimate is listed in Table 13. In total $4.3 million is in the plan, which excludes the neighborhood part of the sidewalk/pathway program.

7.4 Transit

The Older Adult Services Transportation service is essential for maintaining the quality of life for those citizens of Novi 55 years of age and older. Therefore, the TMP expects the service to continue in its current form which costs about $160,000 per year. Additionally, it is proposed that a "mall" circulator be tested on Saturdays over a six-month period. The cost of this "trial" program is estimated at $45,000. The vehicles will be those of the OAST available for six hours on Saturdays. If the service proves successful, additional hours of service may be beneficial, which may require additional equipment.

If the 1.2 mil increase in property taxes is approved in a November, 2016, referendum supported by the Regional Transit Authority, the City of Novi would contribute approximately $3.8 million per year. By legislative mandate, no county can receive transit services which cost less than 85% of what it contributes in taxes. That may mean regional transit may be in Novi's future. There is a caveat: It is not known if the 85% formula applies to cities within a county. In other words, even though there is a "floor" on what needs to be spent by the RTA by county, it may not be uniformly applied by jurisdiction within the county.

8. Observations

The City of Novi has multi-modal transportation needs which require state/federal assistance. Both these governments passed transportation funding legislation in 2015. Thoroughfare Master Plan projects proposed to be implemented over the period FY 2016-2025 include:

- Roads ($41.3 million) and intersection ($5.8 million) at $47.1 million. Beck Road widening is phased over FY 2017-2021 while expanding 10 Mile Road is phased between FY 2021-2025. Intersection improvements are programmed to occur between 2016 and 2020. Even with new state and federal programs, future funding will be tight because so much of Michigan's transportation infrastructure requires long-delayed fixes that will consume most of the new revenue.
- Sidewalk and pathway projects that are part of the plan are scheduled to be built in the period FY 2016-2022 at a cost of $4.3 million. Other top projects add $11.4 to that proposed investment.
- Continuing the Older Adults transportation program, will cost $160,000 per year, excluding inflation.
- A $45,000, six-month "trial" mall circulator project.
- Major transit developments appear to be dependent on the Regional Transportation Authority's multi-county referendum of November, 2016.

While Novi is aggressive in its road and pathways/sidewalks programs, transit in Novi is limited. Regional transit is not available because Novi "opted-out" of the tax that supports SMART. Nonetheless, more transit service may be in Novi's future if the November, 2016, vote on 1.2 mils of additional property taxes is a "regional yes". In that case, Novi's annual contribution to the regional system is estimated at $3.8 million. By legislative mandate, no county can receive transit services which cost less than 85% of what it contributes in taxes. There is a caveat: It is not known if the 85% formula applies to cities within a county.

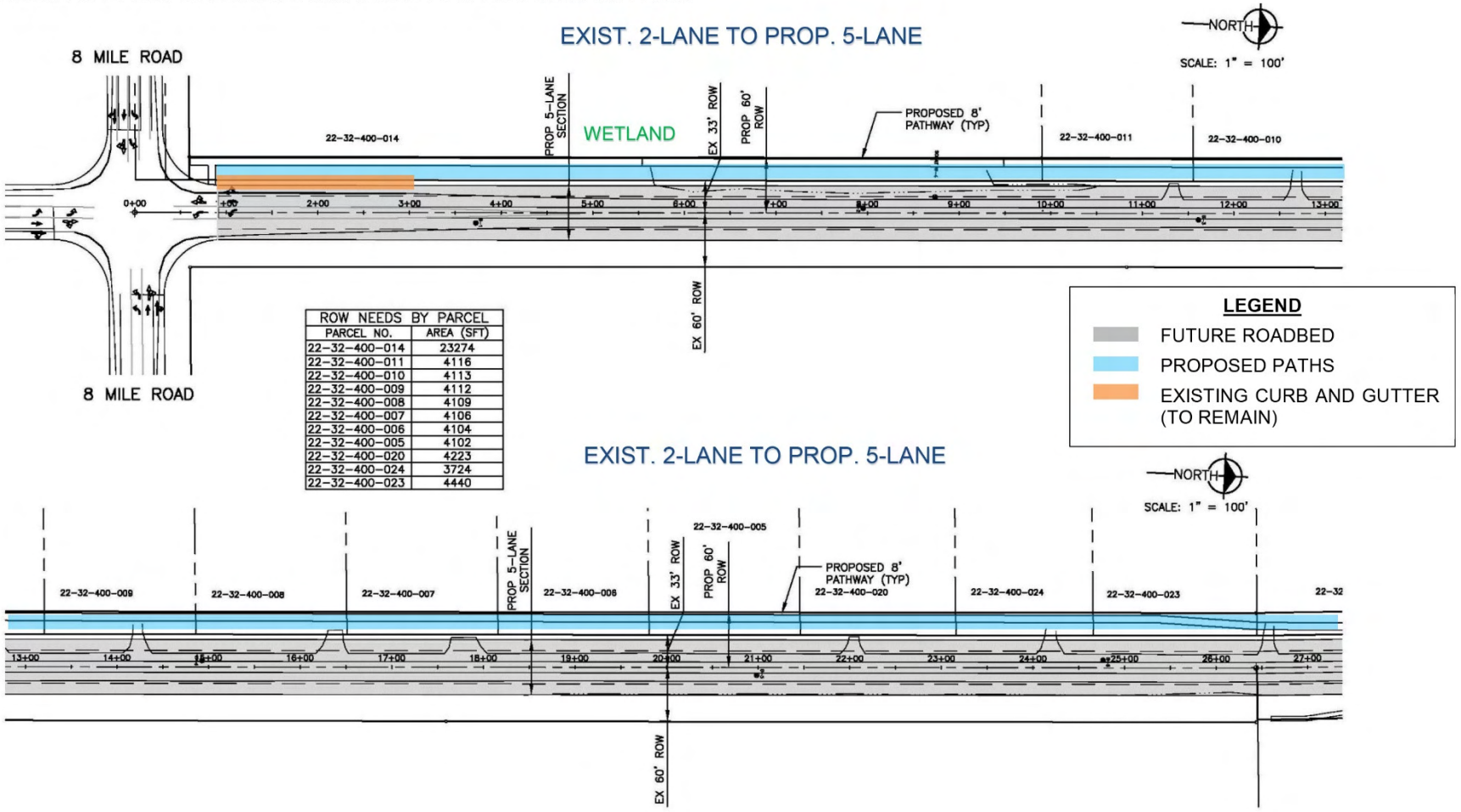
Novi's transportation future is brighter now than when the last TMP was prepared. To strengthen that outlook, Novi's officials and citizens must be aggressive with their state and federal government representatives to secure their share of funding. And they must decide how to address the RTA referendum, knowing that it will be a regional yes or no vote. There is no "opt-out" provision for individual cities or counties.

Appendix

Proposed Improvements

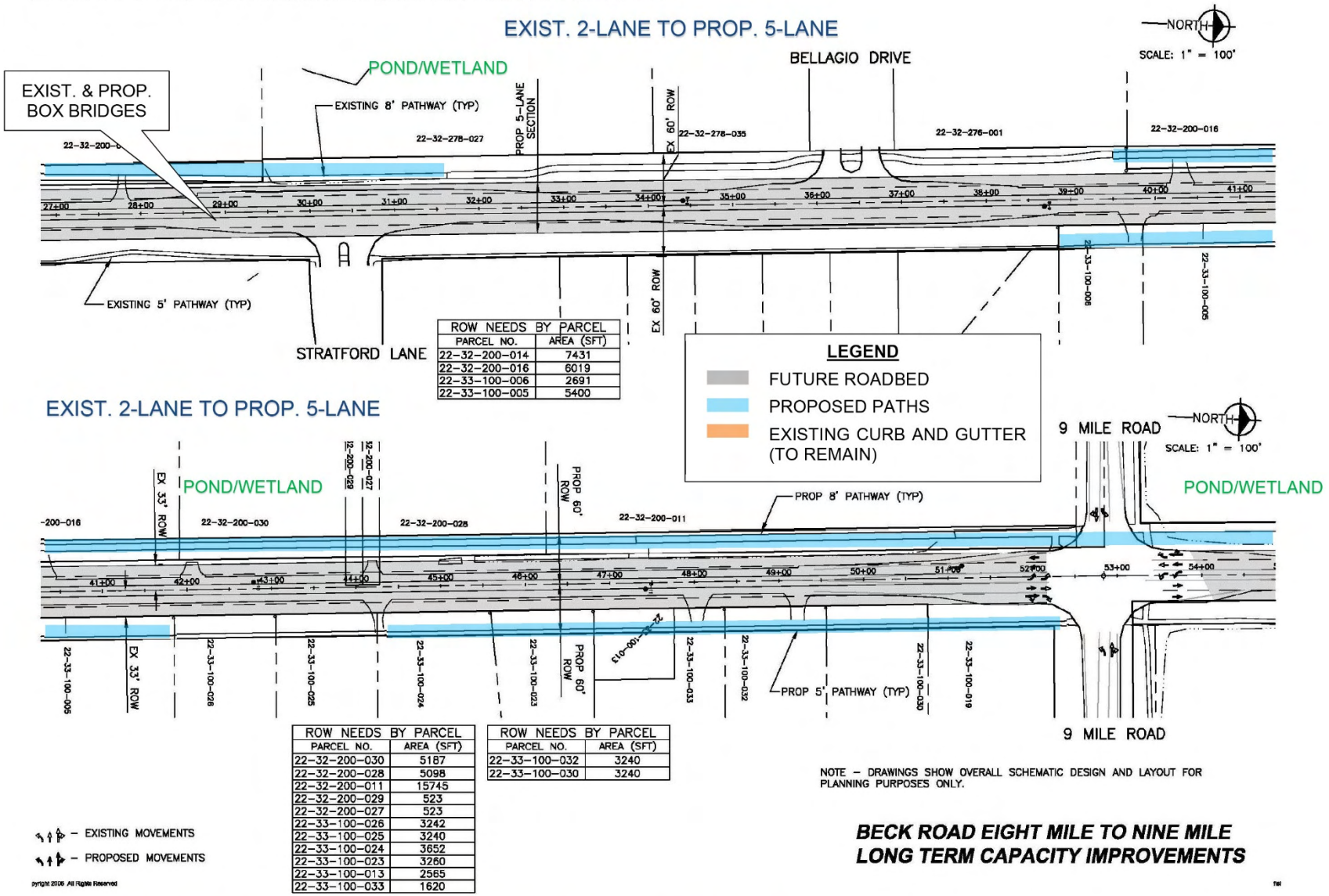
to Beck Road and 10 Mile Road

FIGURE 1: BECK ROAD FROM 8 MILE ROAD TO NEAR STRATFORD LANE



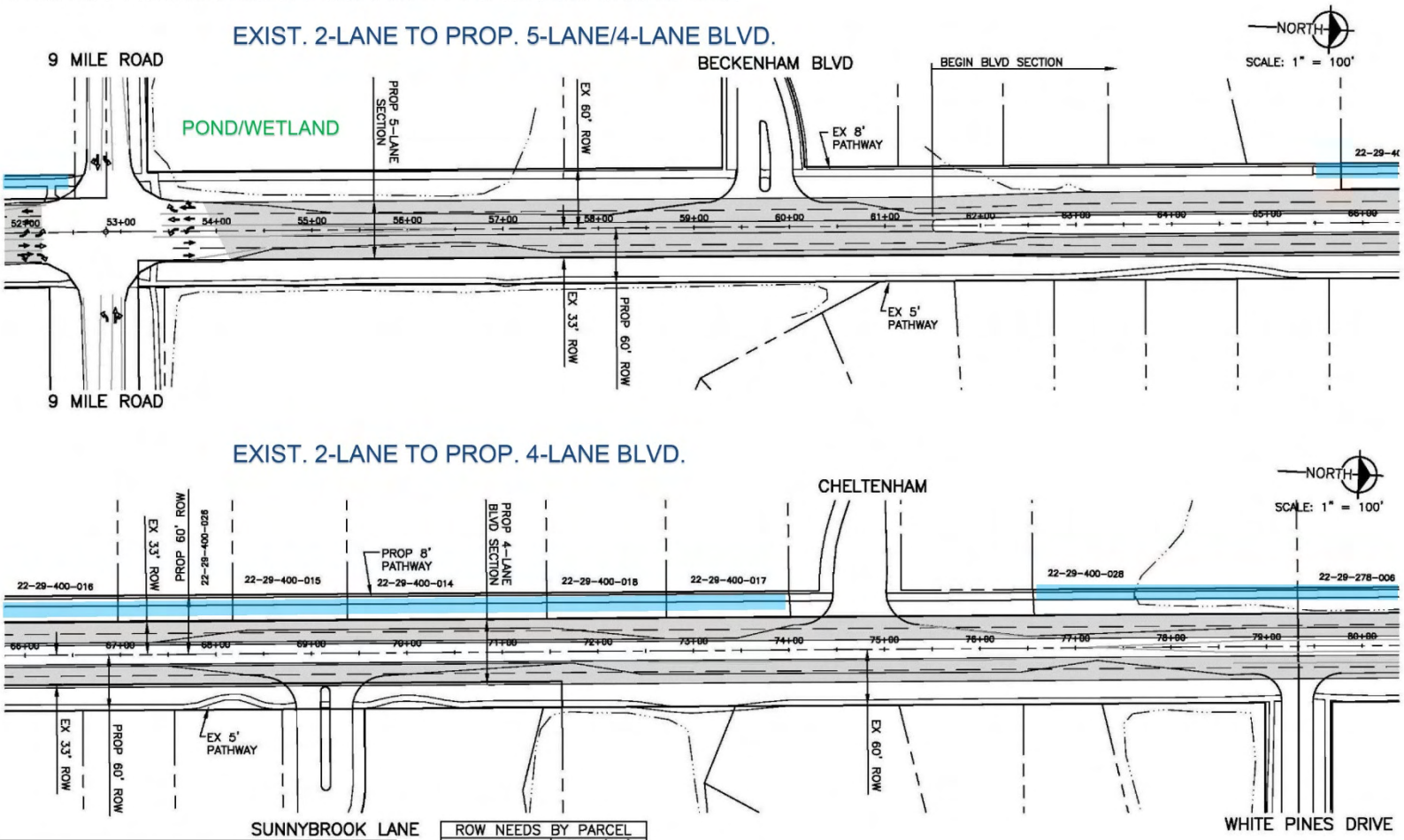
Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

FIGURE 2: BECK ROAD FROM NEAR STRATFORD LANE TO 9 MILE ROAD



Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

FIGURE 3: BECK ROAD FROM 9 MILE ROAD TO NEAR WHITE PINES DRIVE



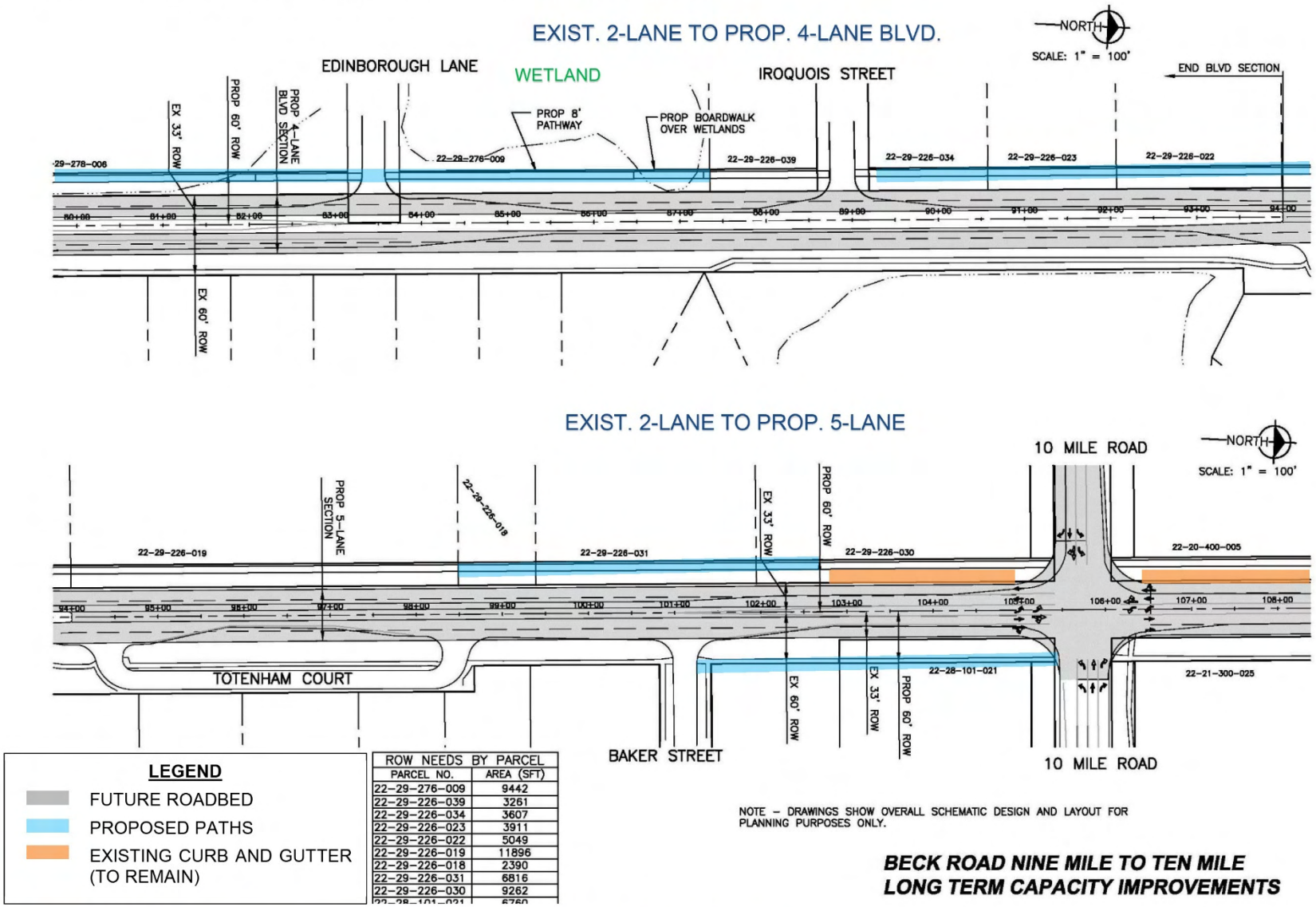
ROW NEEDS BY PARCEL	
PARCEL NO.	AREA (SFT)
22-29-400-016	3240
22-29-400-026	3248
22-29-400-015	3238
22-29-400-014	5632
22-29-400-018	2962
22-29-400-017	3477
22-29-400-028	7437
22-29-278-006	10142

NOTE – DRAWINGS SHOW OVERALL SCHEMATIC DESIGN AND LAYOUT FOR PLANNING PURPOSES ONLY.

BECK ROAD NINE MILE TO TEN MILE LONG TERM CAPACITY IMPROVEMENTS

Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

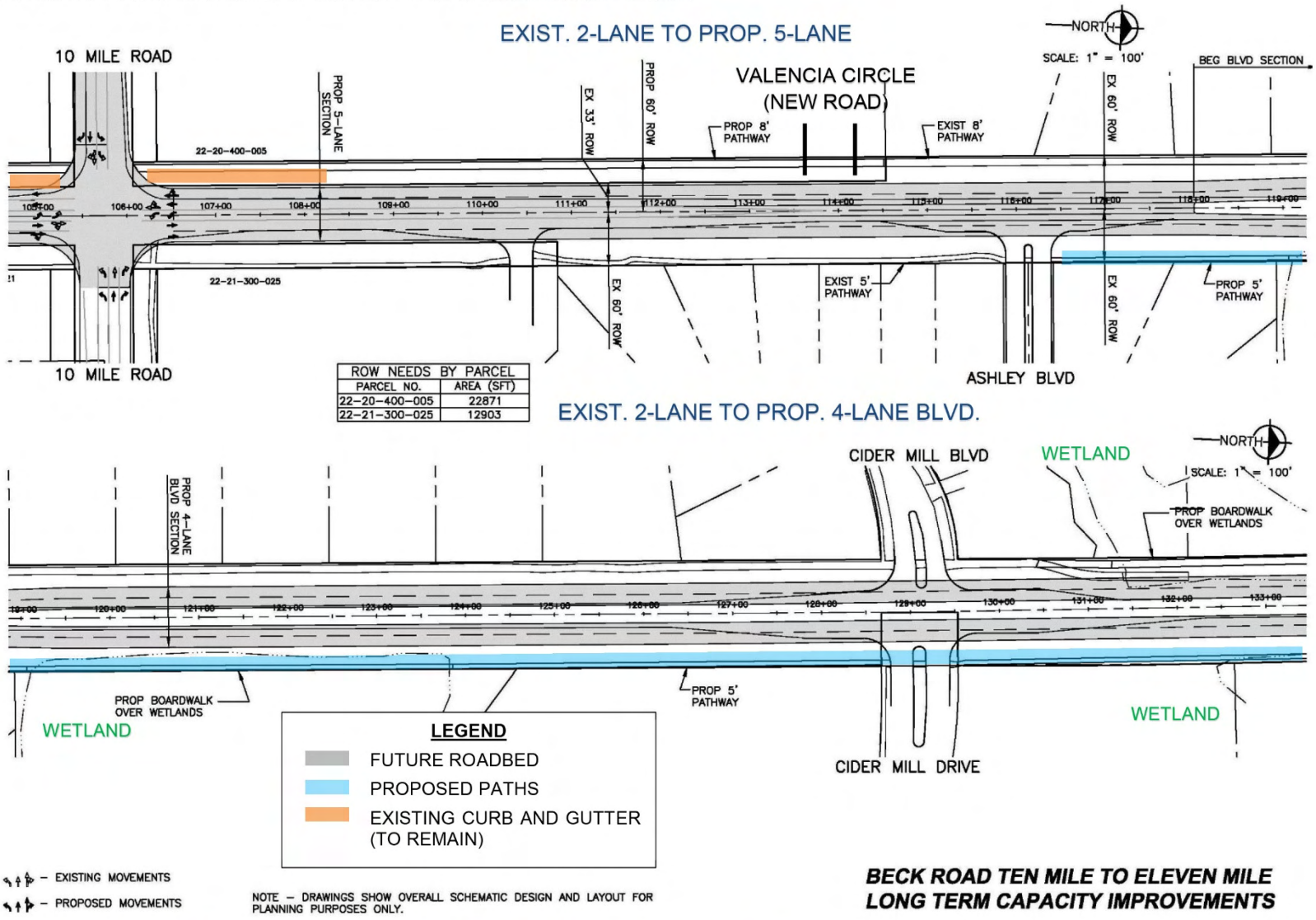
FIGURE 4: BECK ROAD FROM NEAR WHITE PINES DRIVE TO 10 MILE ROAD



ROW NEEDS BY PARCEL	
PARCEL NO.	AREA (SFT)
22-29-276-009	9442
22-29-226-039	3261
22-29-226-034	3607
22-29-226-023	3911
22-29-226-022	5049
22-29-226-019	11896
22-29-226-018	2390
22-29-226-031	6816
22-29-226-030	9262
22-28-101-021	6760

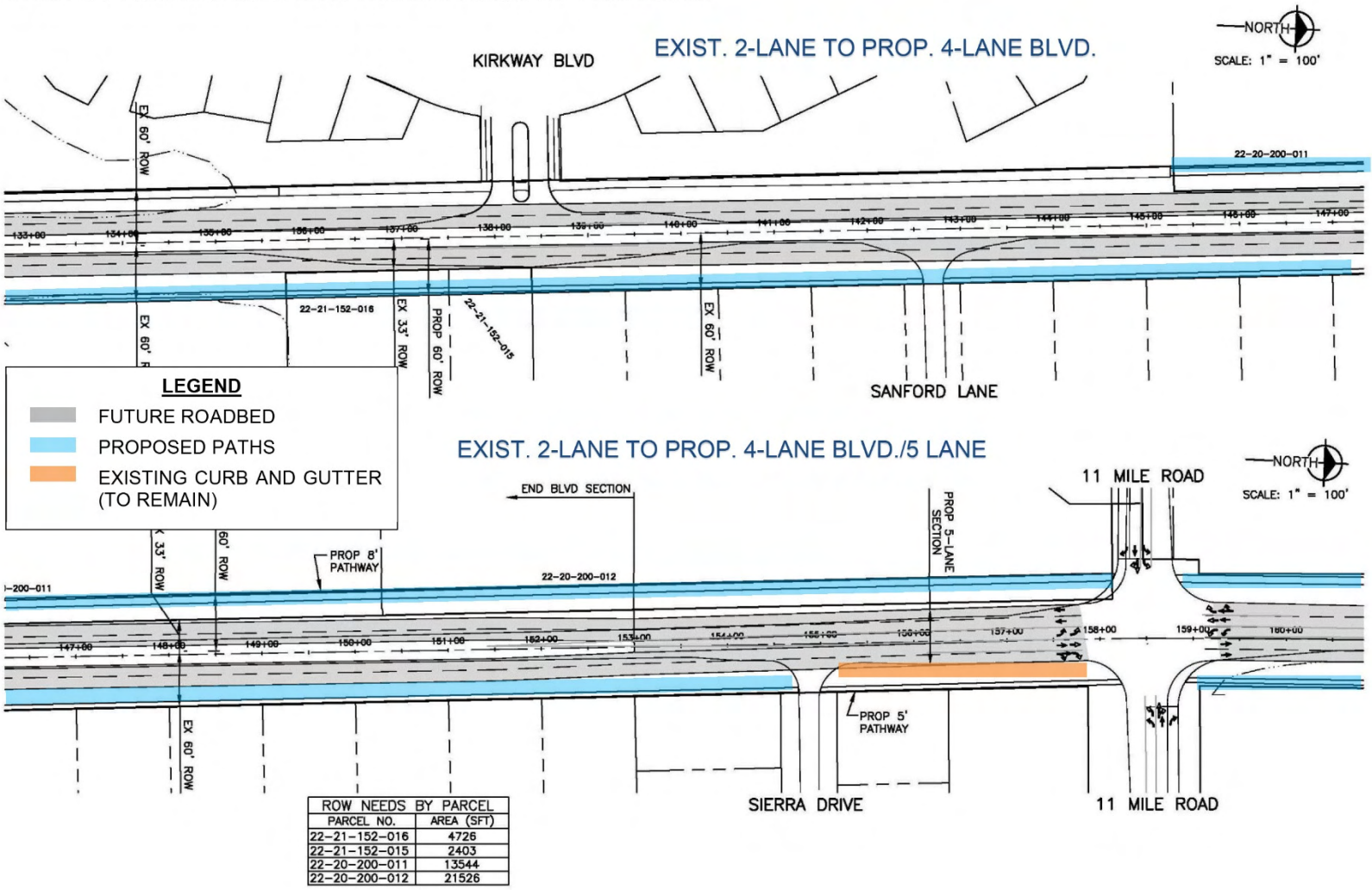
Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

FIGURE 5: BECK ROAD FROM 10 MILE ROAD TO NEAR CIDER MILL DRIVE



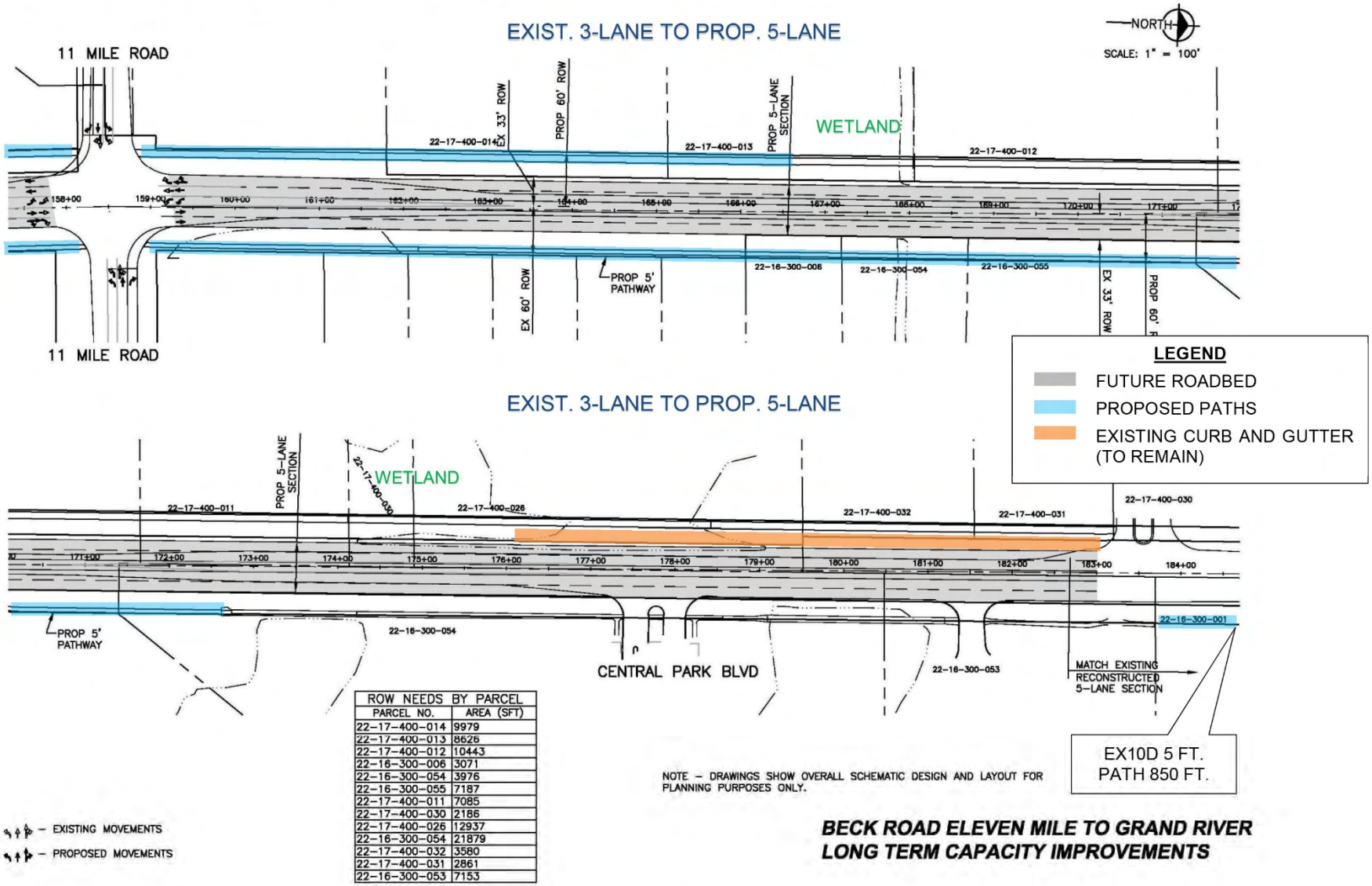
Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

FIGURE 6: BECK ROAD FROM NEAR CIDER MILL DRIVE TO 11 MILE ROAD



Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

FIGURE 7: BECK ROAD FROM 11 MILE ROAD TO NEAR GRAND RIVER AVENUE



ROW NEEDS BY PARCEL

PARCEL NO.	AREA (SFT)
22-17-400-014	9979
22-17-400-013	8626
22-17-400-012	10443
22-16-300-008	3071
22-16-300-054	3976
22-16-300-055	7187
22-17-400-011	7085
22-17-400-030	2186
22-17-400-026	12937
22-16-300-054	21879
22-17-400-032	3580
22-17-400-031	2861
22-16-300-053	7153

Source: Fishbeck, Thompson, Carr &Huber, Inc., Scoping Study Beck Road, 2006; & The Corradino Group, 2016

Route:	Beck Road
Description:	8-Mile Road to 9-Mile Road
County:	Oakland
Length:	1 Mile(s)
Date:	March 25, 2016

DESCRIPTION	TOTAL
Right-of-Way	$ 270,000
Clearing and Grubbing	$ 8,000
Earthwork	$ 180,000
Railroad Crossing or Separation	$ -
Drainage	$ 468,000
Utilities	$ -
Structures	$ 158,000
Pavement Removal	$ 149,000
Paving	$ 1,329,000
Roadway and Pavement Appurtenances	$ 324,000
Retaining Walls	$ 79,000
Topsoil	$ -
Seeding	$ -
Sodding	$ 29,000
Rip-Rap or Slope Protection	$ -
Fencing	$ -
Signing	$ 10,000
Pavement Markings	$ 15,000
Lighting	$ -
Signalization	$ 75,000
Guardrail	$ 25,000
Pay Item Quantity Adjustment (15%)[1]	$ 467,900
Maintenance of Traffic (5%)	$ 179,300
Mobilization (5%)	$ 179,300
CONSTRUCTION COST (rounded)	$ 3,945,500
Contingency (20%)	$ 789,100
Engineering (25%)	$ 986,400
TOTAL CONSTRUCTION COST (rounded)	$ 5,721,000
Preliminary Engineering (10%)	$ 572,100
PROJECT COST (rounded)	**$ 6,293,100**

[1] *For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.*

Route:	Beck Road
Description:	9-Mile Road to 10-Mile Road
County:	Oakland
Length:	1 Mile(s)
Date:	April 5, 2016

DESCRIPTION	TOTAL
Right-of-Way	$ 239,000
Clearing and Grubbing	$ 6,000
Earthwork	$ 182,000
Railroad Crossing or Separation	$ -
Drainage	$ 472,000
Utilities	$ -
Structures	$ -
Pavement Removal	$ 159,000
Paving	$ 1,135,000
Roadway and Pavement Appurtenances	$ 352,000
Retaining Walls	$ 63,000
Topsoil	$ -
Seeding	$ -
Sodding	$ 29,000
Rip-Rap or Slope Protection	$ -
Fencing	$ -
Signing	$ 10,000
Pavement Markings	$ 14,000
Lighting	$ -
Signalization	$ 75,000
Guardrail	$ 22,000
Pay Item Quantity Adjustment (15%)[1]	$ 413,700
Maintenance of Traffic (5%)	$ 158,600
Mobilization (5%)	$ 158,600
CONSTRUCTION COST (rounded)	$ 3,488,900
Contingency (20%)	$ 697,800
Engineering (25%)	$ 872,200
TOTAL CONSTRUCTION COST (rounded)	$ 5,058,900
Preliminary Engineering (10%)	$ 505,900
PROJECT COST (rounded)	**$ 5,564,800**

[1] *For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.*

Route:	Beck Road
Description:	10-Mile Road to 11-Mile Road
County:	Oakland
Length:	1 Mile(s)
Date:	April 5, 2016

DESCRIPTION	TOTAL
Right-of-Way	$ 485,000
Clearing and Grubbing	$ 4,000
Earthwork	$ 185,000
Railroad Crossing or Separation	$ -
Drainage	$ 468,000
Utilities	$ -
Structures	$ -
Pavement Removal	$ 166,000
Paving	$ 1,138,000
Roadway and Pavement Appurtenances	$ 379,000
Retaining Walls	$ 74,000
Topsoil	$ -
Seeding	$ -
Sodding	$ 29,000
Rip-Rap or Slope Protection	$ -
Fencing	$ -
Signing	$ 10,000
Pavement Markings	$ 14,000
Lighting	$ -
Signalization	$ 150,000
Guardrail	$ 28,000
Pay Item Quantity Adjustment (15%)[1]	$ 469,500
Maintenance of Traffic (5%)	$ 180,000
Mobilization (5%)	$ 180,000
CONSTRUCTION COST (rounded)	$ 3,959,500
Contingency (20%)	$ 791,900
Engineering (25%)	$ 989,900
TOTAL CONSTRUCTION COST (rounded)	$ 5,741,300
Preliminary Engineering (10%)	$ 574,100
PROJECT COST (rounded)	**$ 6,315,400**

[1] *For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.*

Route:	Beck Road
Description:	11-Mile Road to Grand River Avenue
County:	Oakland
Length:	0.45 Mile(s)
Date:	March 25, 2016

DESCRIPTION	TOTAL
Right-of-Way	$ 300,000
Clearing and Grubbing	$ 6,000
Earthwork	$ 81,000
Railroad Crossing or Separation	$ -
Drainage	$ 206,000
Utilities	$ -
Structures	$ -
Pavement Removal	$ 100,000
Paving	$ 598,000
Roadway and Pavement Appurtenances	$ 132,000
Retaining Walls	$ 32,000
Topsoil	$ -
Seeding	$ -
Sodding	$ 13,000
Rip-Rap or Slope Protection	$ -
Fencing	$ -
Signing	$ 5,000
Pavement Markings	$ 7,000
Lighting	$ -
Signalization	$ 150,000
Guardrail	$ 17,000
Pay Item Quantity Adjustment (15%)[1]	$ 247,100
Maintenance of Traffic (5%)	$ 94,700
Mobilization (5%)	$ 94,700
CONSTRUCTION COST (rounded)	$ 2,083,500
Contingency (20%)	$ 416,700
Engineering (25%)	$ 520,900
TOTAL CONSTRUCTION COST (rounded)	$ 3,021,100
Preliminary Engineering (10%)	$ 302,100
PROJECT COST (rounded)	**$ 3,323,200**

[1] *For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.*

Route:	10 Mile Road - Preliminary Estimate
Description:	Upgrade to multilane
	from Hagerty Road to Taft Road
County:	
Length:	3 Miles
Date:	March 16, 2016

DESCRIPTION	TOTAL
Right-of-Way	$ 458,000
Clearing and Grubbing	$ 15,000
Earthwork	$ 610,000
Railroad Crossing or Separation	$ 164,000
Drainage	$ 1,417,000
Utilities	$ -
Structures	$ 1,403,000
Pavement Removal	$ -
Paving	$ 3,987,000
Roadway and Pavement Appurtenances	$ 591,000
Retaining Walls	$ 112,000
Topsoil	$ -
Seeding	$ -
Sodding	$ 71,000
Rip-Rap or Slope Protection	$ -
Fencing	$ -
Signing	$ 30,000
Pavement Markings	$ 45,000
Lighting	$ -
Signalization	$ 900,000
Guardrail	$ -
Pay Item Quantity Adjustment (15%)[1]	$ 1,470,500
Maintenance of Traffic (5%)	$ 563,700
Mobilization (5%)	$ 563,700
CONSTRUCTION COST (rounded)	$ 12,400,900
Contingency (20%)	$ 2,480,200
Engineering (25%)	$ 3,100,200
TOTAL CONSTRUCTION COST (rounded)	$ 17,981,300
Preliminary Engineering (10%)	$ 1,798,100
PROJECT COST [2](rounded)	**$ 19,779,400**

[1] *For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.*

[2] *For estimating future project costs, a compounded inflation rate of 10% should be applied from the date of this estimate.*

DRAFT

Novi Road/Grand River Avenue Area Multi-Development Traffic Impact Study - DRAFT

City of Novi

October 12, 2018

DRAFT

Quality information

Prepared by	Checked by	Approved by
Maureen Peters, PE Dan Robyns, PE PTOE		

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Revision	Revision date	Details	Authorized	Name	Position
1	9/7/18	Initial Draft		Maureen Peters	Traffic Engineer/PM
2	10/12/18	Revised Draft		Maureen Peters	Traffic Engineer/PM

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1. Introduction

1.1 Background Information

The City of Novi has requested the support of AECOM to perform a traffic impact study (TIS) for the City's Town Center area. The Novi Town Center is comprised of several developments surrounding the intersection of Novi Road and Grand River Avenue. The Novi Town Center area has several developments in the planning phase as well as additional parcels that are available for future development. Due to the routine traffic concerns in the area, it was recommended to analyze the potential future traffic impacts and mitigation measures associated with the multiple developments collectively, rather than through a typical, independent TIS that are usually prepared as part of the City's site plan development process. Combining the developments into one TIS will allow the City to assess the traffic impacts beyond the developments' build years and will serve as a planning tool to identify and prepare for roadway modifications as additional developments are introduced into the general area.

AECOM has identified 15 developments that are expected to be incorporated into the overall study, as shown in **Figure 1**. Seven of the developments have either been approved and are in the construction phase or are in the planning stage and currently under review. Some of the background developments produced their own independent studies that may be referenced within this report for the purpose of developing trip generation estimates. There are an additional eight developments/parcels within the general area that could be developed at a later date.

The study includes 10 existing signalized intersections and five unsignalized intersections, as shown in **Figure 2**. The study will also consider the extension of Crescent Boulevard to Grand River Avenue on the west side of Novi Road as part of any future scenarios, which adds a potential eleventh signalized intersection.

1.2 Report Organization

Following the introductory section (Section 1), the report is composed of the following sections:

- **Section 2: Existing (2018) Conditions**
  Section 2 provides a description of the existing transportation facilities and contains an analysis of the existing 2018 peak-hour traffic conditions within the study area.

- **Section 3: Background (2028) Conditions**
  Section 3 contains an analysis of background year (2028) peak-hour traffic conditions – conditions for the projected opening year (2028) of all study area background developments, but without traffic generated by the future developments. Background conditions include estimated traffic from the background developments identified in Figure 1 and are used as a "baseline" from which impacts associated with the future developments can be quantified. Any roadway capacity improvements proposed to be completed by the background developments have also been included.

- **Section 4: Future (2028) Conditions**
  Section 4 contains an analysis of traffic conditions during the projected completion of all proposed developments (2028), including traffic generated by the future developments listed in Figure 1. Future conditions can be compared to background conditions to quantify the impact of the proposed developments.

- **Section 5: Potential Future Mitigation**
  Section 5 contains a discussion of potential mitigation options that could improve the operation of intersections and traffic movements that are projected to operate poorly under future conditions. Varying levels of mitigation options were examined based on input from the City.

- **Section 6: Conclusion**
  Section 6 provides a summary of the analysis and mitigation options available that may lead to improvements in traffic operations throughout the study area.

2. Existing (2018) Conditions

Section 2 provides a description of the existing transportation facilities and contains an analysis of the existing 2018 peak-hour traffic conditions within the study area.

2.1 Study Area

The study area for the TIS generally includes intersections located within and in the vicinity of the Town Center area. A total of 15 intersections have been included in the study area under existing conditions as listed below. Refer to Figure 2, Study Area Intersections, for the locations of these intersections. Note that 16 intersections are shown in the map. The sixteenth intersection, Grand River Avenue at Crescent Boulevard, is a proposed signalized intersection that will be reviewed as part of Background (2028) and Future (2028) conditions and is not included in the Existing (2018) conditions analysis.

1. Novi Road and West Oaks Drive South
2. Novi Road and westbound I-96 off-ramp
3. Novi Road and eastbound I-96 off-ramp
4. Novi Road and Crescent Boulevard
5. Novi Road and Grand River Avenue
6. Novi Road and Flint Street/Main Street
7. Novi Road and Trans X Road
8. Novi Road and US Post Office Driveway
9. Novi Road and Ten Mile Road
10. Grand River Avenue and Flint Street
11. Grand River Avenue and Sixth Gate
12. Grand River Avenue and Main Street/Town Center Drive
13. Grand River Avenue and Meadowbrook Road
14. Eleven Mile Road and Town Center Drive
15. Main Street and Potomac

2.2 Existing Roadways

The study area comprises the following major arterials:

Novi Road is a north-south arterial roadway generally comprised of five lanes to the south of I-96, and seven lanes to the north of I-96. Novi Road has a posted speed limit of 45 mph in the study area.

The Novi Road and Grand River Avenue intersection is signalized with left-turn phases for each approach and is controlled by the Road Commission for Oakland County's (RCOC) Sydney Coordinated Adaptive Traffic System (SCATS). The maximum cycle length is approximately 150 seconds during peak-hours of traffic.

Grand River Avenue is an east-west arterial that varies from five lanes to the west of Novi Road, to three lanes to the east of Meadowbrook Road. The posted speed limit within the study area is 40 mph to the west of Main Street/Town Center Drive, and 50 mph to the east of Main Street/Town Center Drive.

The Grand River Avenue and Meadowbrook Road intersection is signalized with left-turn phases at each approach and is controlled by RCOC's SCATS system. The maximum cycle length is 150 seconds during peak hours of traffic.

Meadowbrook Road is a north-south arterial and is comprised of three lanes with a posted speed limit of 40 mph.

Ten Mile Road is an east-west arterial and is comprised of two lanes with a posted speed limit of 45 mph.

The Novi Road and Ten Mile Road intersection is signalized with left-turn phases for each approach and is controlled by RCOC's SCATS system. The maximum cycle length is 150 seconds during peak-hours of traffic.

The I-96 interchange is a partial cloverleaf with two loop ramps for entering freeway traffic. The westbound exit ramp to Novi Road is comprised of five lanes, and the eastbound exit ramp to Novi Road is comprised of three lanes. Both

exit ramps are signalized and controlled by RCOC's SCATS system. The maximum cycle lengths are 150 seconds during peak-hours of traffic.

All other roadways in this study can be generalized as collector roadways, stub streets, or driveways. Crescent Boulevard, Main Street, and Flint Street (Bond Street) are expected to eventually form a "loop" road around the intersection of Novi Road and Grand River Avenue. It is expected that the loop roadway may detour a percentage of traffic away from the Novi Road and Grand River Avenue intersection.

2.3 Existing (2018) Conditions Capacity Analysis

AECOM collected peak-hour turning movement counts at the study area intersections during March/April 2018 for the Weekday Morning (7-9 AM), Weekday Afternoon (4-6 PM), and Saturday Midday (1-3 PM) peak periods of traffic. The traffic data count reports that were collected as part of this study are included in **Appendix A**.

In order to quantify intersection traffic operations at the study-area intersections, existing level-of-service (LOS) values were determined using the industry-standard methodology presented in the Highway Capacity Manual (2010), published by the Transportation Research Board (TRB). Synchro® traffic analysis software (version 9), based on the Highway Capacity Manual (2000) methodologies, was used in the analysis.

The term "level-of-service" (LOS) denotes how well (or poorly) a traffic movement operates under given traffic demands, lane configurations, and traffic controls. Each level is determined by the average amount of control delay per vehicle. Control delay is the total delay associated with stopping for a traffic signal or stop sign, and includes four components; deceleration delay, queue move up time, stopped delay, and final acceleration delay.

As shown in **Table 1**, LOS "A" indicates small average control delays (less than ten seconds per vehicle) whereas LOS "F" indicates intersection failure, resulting in extensive vehicular queues and long delays (over 80 seconds per vehicle at a signalized intersection). **LOS "D" (or better) is typically considered acceptable performance and low LOS values are tolerable for short time periods or during peak-hours when heavier traffic volumes are expected.**

Table 1 - Level of Service Criteria at Intersections

Level-of-Service	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	10 - 20	10 - 15
C	20 - 35	15 - 25
D	35 - 55	25 - 35
E	55 - 80	35 - 50
F	> 80	>50

Source: *HCM, 2010*

The existing (2018) conditions peak-hour intersection LOS results for the 10 signalized intersection and five unsignalized intersections listed on page 6 are shown in **Table 2**. The existing (2018) conditions peak-hour traffic volumes and movement-by-movement LOS results are depicted in **Figure 3**. Capacity analysis reports from the *Synchro*® software for all intersections are included in **Appendix B-1**.

Table 2 – Existing (2018) Conditions Intersection LOS Results

Intersection	Traffic Control	Weekday AM Peak-Hour		Weekday PM Peak-Hour		Saturday Midday Peak-Hour	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Novi Road and West Oaks Drive South	*Signalized*	13.9	B	32.6	C	51.7	D
Novi Road and WB I-96 Off-Ramp	*Signalized*	42.8	D	30.8	C	30.5	C
Novi Road and EB I-96 Off-Ramp	*Signalized*	8.7	A	13.2	B	15.4	B
Novi Road and Crescent Boulevard	*Signalized*	13.2	B	24.3	C	29.9	C
Novi Road and Grand River Avenue	*Signalized*	**60.0**	**E**	**68.8**	**E**	**60.3**	**E**
Novi Road and Flint Street/Main Street	*Signalized*	13.6	B	12.0	B	11.2	B
Novi Road and Trans X Road (WB approach results shown)	*1-Way STOP*	14.7	B	18.4	C	20.8	C
Novi Road and US Post Office Driveway	*Signalized*	3.9	A	5.3	A	4.1	A
Novi Road and Ten Mile Road	*Signalized*	36.3	D	47.1	D	33.9	C
Grand River Avenue and Flint Street (NB approach results shown)	*1-Way STOP*	26.0	D	15.3	C	16.4	C
Grand River Avenue and Sixth Gate (NB approach results shown)	*1-Way STOP*	9.3	A	15.2	C	12.5	B
Grand River Avenue and Main Street/ Town Center Drive	*Signalized*	12.6	B	21.5	C	21.8	C
Grand River Avenue and Meadowbrook Road	*Signalized*	27.1	C	53.5	D	32.5	C
Eleven Mile Road and Town Center Drive	*4-Way STOP*	7.7	A	12.4	B	10.6	B
Main Street and Potomac	*3-Way STOP*	7.6	A	8.1	A	8.5	A

As shown in Table 2, the existing (2018) peak-hour capacity analysis shows that all study area intersections currently operate at an acceptable intersection LOS, with the exception of the Novi Road/Grand River Avenue intersection during all three peak-hours. As shown in Figure 3, several individual turning movements at study area intersections currently operate at unacceptable LOS. Many of these turning movements are relatively low volume movements, and the poor LOS ratings (and lengthy average delay times) are due to the long signal cycle length that the SCATS system provides during peak times to service the major high-volume thru movements.

However, under existing conditions, there are some large volume movements that are currently operating poorly, and should be noted. These movements include:

- At Novi Road/Westbound I-96 off-ramp, the westbound left-turn movement.
- At Novi Road/Eastbound I-96 off-ramp, the eastbound right-turn movement.
- At Novi Road/Grand River Avenue, the westbound and northbound thru movements, as well as all four left-turn movements.
- At Novi Road/Ten Mile Road, the eastbound and northbound left-turn movements.
- At Grand River Avenue/Meadowbrook Road, the westbound and southbound thru movements.

2.4 Existing (2018) Conditions Capacity Analysis (with Mitigation)

The existing poorly operating turning movements were attempted to be mitigated by adjusting signal timings at the study area intersections. Because the intersections are currently controlled by the adaptive control SCATS system, improvement in performance via signal timing adjustments is minor. Some small improvements were achieved using only signal timing adjustments as a mitigation measure.

The existing (2018) conditions (with mitigation) peak-hour intersection LOS results are shown in **Table 3**. The existing (2018) conditions (with mitigation) peak-hour traffic volumes and movement-by-movement LOS results are depicted in **Figure 4**. Capacity analysis reports from the *Synchro*® software for all intersections are included in **Appendix B-2**.

Table 3 – Existing (2018) Conditions (with Mitigation) Intersection LOS Results

Intersection	Traffic Control	Weekday AM Peak-Hour		Weekday PM Peak-Hour		Saturday Midday Peak-Hour	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Novi Road and West Oaks Drive South	*Signalized*	15.0	B	30.5	C	41.0	D
Novi Road and WB I-96 Off-Ramp	*Signalized*	24.4	C	21.1	C	26.4	C
Novi Road and EB I-96 Off-Ramp	*Signalized*	10.1	B	13.1	B	19.8	B
Novi Road and Crescent Boulevard	*Signalized*	10.9	B	29.1	C	32.6	C
Novi Road and Grand River Avenue	*Signalized*	52.5	D	**55.6**	**E**	**56.0**	**E**
Novi Road and Flint Street/Main Street	*Signalized*	13.1	B	12.0	B	11.1	B
Novi Road and Trans X Road (WB approach results shown)	*1-Way STOP*	14.7	B	18.4	C	20.8	C
Novi Road and US Post Office Driveway	*Signalized*	3.9	A	5.3	A	4.4	A
Novi Road and Ten Mile Road	*Signalized*	36.3	D	47.1	D	33.4	C
Grand River Avenue and Flint Street (NB approach results shown)	*1-Way STOP*	26.0	D	15.2	C	16.3	C
Grand River Avenue and Sixth Gate (NB approach results shown)	*1-Way STOP*	9.3	A	15.3	C	12.6	B
Grand River Avenue and Main Street/ Town Center Drive	*Signalized*	12.1	B	21.8	C	21.1	C
Grand River Avenue and Meadowbrook Road	*Signalized*	26.5	C	52.4	D	33.6	C
Eleven Mile Road and Town Center Drive	*4-Way STOP*	7.7	A	12.4	B	10.6	B
Main Street and Potomac	*3-Way STOP*	7.6	A	8.1	A	8.5	A

When comparing to Table 2, Table 3 shows that adjusting signal timings produced incremental improvements at some intersections, including the Novi Road/Westbound I-96 off-ramp and Novi Road/Grand River Avenue intersections. However, the Novi Road/Grand River Avenue intersection would still operate at a poor intersection overall LOS E during the weekday afternoon and Saturday midday peak-hours.

As shown in Figure 4 following the report text, several large turning movements would continue to operate at poor LOS during the three peak-hours, similar to existing conditions without mitigation measures.

3. Background (2028) Conditions

Section 3 contains an analysis of background year (2028) peak-hour traffic conditions – conditions for the projected opening year (2028) of all study area background developments, but without traffic generated by the future developments. Background conditions include estimated traffic from the background developments identified in Figure 1 and are used as a "baseline" from which impacts associated with the future developments can be quantified.

3.1 Background Traffic Volumes

The background traffic volumes (2028) were calculated based on an annual growth rate and adding traffic that is anticipated to be generated by proposed developments within the study area that have been identified by the City of Novi as having been approved or potentially anticipated to be approved in the near term, as indicated in Figure 1 as "background".

3.1.1 Annual Growth Rate

An annual traffic growth rate was used to estimate growth on the study area roadway network based on information provided by the Southeastern Michigan Council of Governments (SEMCOG). Generally, the study area roadway network has experienced a decline in traffic volumes since 2010. However, the population of the City of Novi is expected to increase by approximately 7.1% from the year 2015 to the build-out year of 2028. Further, SEMCOG population projections for Novi are only showing a 0.6% per year growth in population from 2015 to 2030. Based on the information, a conservative annual growth rate of 0.5% was applied to existing (2018) peak-hour volumes to determine background year (2028) peak-hour volumes. Organic growth is addressed via anticipated trip generation from the seven background developments and eight future developments, another reason for using the lower annual percent growth rate of 0.5% per year.

3.1.2 Previously Approved Developments

The City of Novi has identified seven developments within the study area as "background" developments based on their position within the site plan review process.

The Bond development (aka the District, aka Flint Street) is proposed as a mixed-use commercial/residential development including a total of 250 apartments and a 5,578 square foot retail center. The development is located on the southwest side of the existing Flint Street and plans to revitalize Flint Street with on-street parking and other features. The developer submitted a site-specific TIS to the City dated March 15, 2018. The TIS recommends providing permissive/protected left-turn phasing at all left-turn movements at the intersection of Grand River Avenue and Novi Road, providing a 70-second cycle length at the intersection of Novi Road and Flint Street to reduce minor street vehicle delays while maintaining coordination with adjacent 140-second cycle length signals, and to provide an exclusive left-turn lane for the eastbound approach at the intersection of Novi Road and Bond Street/Main Street.

The **Crowe Center** (aka Town Center Gardens) development is now built as a multi-use development consisting of a high-turnover sit-down restaurant, two specialty retail centers, and a medical-dental office. The 8,883 square foot building contains 2,340 square feet of restaurant, 3,041 square feet of retail, and 3,502 square feet for a possible dental office or other retail use. The development is located on the east side of Novi Road south of Crowe Drive. A TIS was not performed for this development; therefore, only site-generated traffic volumes will be added to background Synchro models for this development.

The **Homewood Suites** development is an 88-room hotel that is located east of Town Center Drive and north of 11 Mile Road. A TIS was not performed for this development; therefore, only site-generated traffic volumes will be added to background Synchro models for this development.

The **Learning Experience** development is a proposed 10,000 square foot daycare center that is located on the north side of 11 Mile Road and east of Town Center Drive. A TIS was not performed for this development; therefore, only site-generated traffic volumes will be added to background Synchro models for this development.

The **Huntley Manor** development is a proposed multi-family residential development consisting of 210 apartments. The development is located on the south side of Grand River Avenue to the west of Meadowbrook Road. A site-specific TIS was previously completed in November 2014.

The **Erhard Jaguar/Land Rover** development is a proposed automobile sales development that is located in the southwest corner of the intersection of Grand River Avenue and Meadowbrook Road. The development is comprised of a total of 58,663 square feet that will include both sales and service areas. A site-specific rezoning TIS was prepared for the previous Erhard BMW site and was submitted to the City on October 9, 2017. The TIS did not recommend any modifications; therefore, only site-generated traffic volumes have been added to background Synchro models for this development.

The **Emerson Park** development is a proposed multi-family residential development consisting of 120 units. The development is located on the west side of Novi Road and south of the USPS driveway. A TIS was performed for this development on February 6, 2017. The study suggested mitigation measures to include reducing the cycle length at the US Post Office Driveway to 60 seconds instead of 120 seconds to more effectively service side street traffic under existing conditions. A southbound right-turn taper lane at the proposed site driveway was also recommended as it met warrants.

3.1.3 Trip Generation

The proposed trip generation for the seven background developments is shown in **Table 4.**

Background (2028) trip generation determination for the weekday morning, afternoon, and Saturday midday peak-hours for the background developments was based on the methods of the ITE Trip Generation Manual. Trip generation was performed based on the methods of the *ITE Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineers (ITE). The *ITE Trip Generation Manual* contains information on more than 4,800 trip generation studies nationwide for different land use purposes.

Pass-By Site Trips

It is anticipated that the shopping center in The Bond development will capitalize on the traffic volumes along Novi Road and Grand River Avenue by “capturing” customers passing by the location to/from work or other destinations. These trips are classified as “pass-by” trips, since they are already on the roadway network and enter the site as they drive past. While pass-by trips do not add new trips to the roadway network, they add turning movements at the site driveway locations.

For a shopping center land use, the ITE Trip Generation Handbook provides data for pass-by traffic for the weekday afternoon peak-hour and Saturday midday peak-hour, indicating an average pass-by rate of 35%.

Traffic generated by the proposed developments was used to measure the impact of the developments on the study area intersections for the background (2028) conditions.

Table 4 – Background (2028) Trip Generation

Development #	Development Name	Land Use Description	ITE Land Use	ITE LUC	Size	Units	Weekday AM Peak-Hour Trips			Weekday PM Peak-Hour Trips			Saturday Midday Peak-Hour Trips		
							Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
9	The Bond	retail space	**Shopping Center**	**820**	**6,000**	SF				33	35	**68**	35	32	**67**
			Less: Pass-by trips (35% PM peak-hour, 35% Saturday peak-hour)							-12	-12	**-24**	-12	-12	**-24**
		apartments	**Multi-Family Housing (MID-rise)**	**221**	**250**	units	22	62	**84**	65	42	**107**	54	56	**110**
		The Bond Development TOTAL (Net New)					**22**	**62**	**84**	**86**	**65**	**151**	**77**	**76**	**153**
10	Crowe Center	restaurant	**High-Turnover Sit-Down Restaurant**	**932**	**2,340**	SF	13	10	**23**	14	9	**23**	13	13	**26**
		specialty retail center	**Variety Store**	**814**	**3,041**	SF				11	10	**21**	11	10	**21**
		medical-dental office	**Medical-Dental Office**	**720**	**3,502**	SF	9	2	**11**	4	10	**14**	6	5	**11**
		Crowe Center Development TOTAL					**22**	**12**	**34**	**29**	**29**	**58**	**30**	**28**	**58**
11	Homewood Suites	suites hotel	**All Suites Hotel**	**311**	**88**	occ'd rooms	28	14	**42**	20	26	**46**	13	10	**23**
12	The Learning Experience	daycare	**Day Care Center**	**565**	**10,000**	SF	58	52	**110**	52	59	**111**	11	6	**17**
13	Huntley Manor	apartments	**Multi-Family Housing (low-rise)**	**220**	**210**	units	22	75	**97**	72	42	**114**	97	97	**194**
14	Erhard Auto Sales	auto sales	**Automobile Sales (New)**	**840**	**58,663**	SF	80	30	**110**	51	76	**127**	118	118	**236**
15	Emerson Park	multi-family housing	**Multi-Family Housing (low-rise)**	**220**	**123**	units	13	45	**58**	45	26	**71**	50	50	**100**
Total NET NEW Peak-Hour Trips							245	290	**535**	355	323	**678**	396	385	**781**
							AM Peak Hour			**PM Peak Hour**			**Sat Peak Hour**		

Source: ITE Trip Generation Manual, 10th Ed & ITE Trip Generation Handbook, 3rd Ed

Assumes no AM trip generation (not open)

As shown in Table 4, the proposed background developments are projected to generate:

- 535 net new trips (245 entering trips, 290 exiting trips) in the background (2028) weekday morning peak-hour
- 678 net new trips (355 entering trips, 323 exiting trips) in the background (2028) weekday afternoon peak-hour
- 781 net new trips (396 entering trips, 385 exiting trips) in the background (2028) build Saturday midday peak-hour

3.1.4 Trip Distribution and Traffic Assignment

Background development generated trips were assigned to the roadway network based on a methodology that considers traffic volumes entering and exiting the study area via the perimeter intersections. Trip distribution was calculated based on the total two-way trips to/from these perimeter intersections, with separate computations for each peak-hour, based on the respective peak-hour's two-way volumes. AECOM met with the City of Novi and the Road Commission of Oakland County (RCOC) on August 14, 2018 and received acceptance from the City and RCOC on the trip distribution methodology. Based on these two-way volumes at the perimeter intersections, perimeter trip distribution percentages are depicted in **Figure 5**.

The traffic generated by the seven background developments was assigned to the roadway network based on the determined trip distribution percentages. The total background development traffic that would be added to the roadway network is shown in Figure 5. Traffic volumes for each of the seven individual developments are shown separately in **Figures 5A to 5G**.

As shown in Figure 5, several turning movements in the study area will experience an increase in traffic due to trips generated by background developments. Significant increases include:

1. Westbound I-96 off-ramp left-turn at Novi Road
2. Southbound Novi Road left-turn at Grand River Avenue
3. Westbound Grand River Avenue left-turn at Novi Road
4. Northbound Meadowbrook Road left-turn at Grand River Avenue

3.2 Background (2028) Conditions Capacity Analysis

A capacity analysis was conducted for the study area intersections under background (2028) traffic conditions. The background (2028) analysis included two major changes to the study area roadway network. First, based on conversations with the City, it was assumed that the new Bond Street (replacing Flint Street) would be constructed in alignment with The Bond development in the southwest quadrant of Novi Road/Grand River Avenue. Second, it was assumed that Crescent Boulevard would be extended to Grand River Avenue, opposite Bond Street, to the west of Novi Road. It was also assumed that a new traffic signal would be installed at the new intersection of Grand River Avenue with Bond Street/Crescent Boulevard. This signal would be located approximately 1,000 feet west of the Novi Road/Grand River Avenue intersection. The existing Flint Street stub street that intersects with Grand River just west of Novi Road would remain in place. Refer to **Appendix C** for the Bond Street and Crescent Boulevard draft plans.

The background traffic volumes at Novi Road/Grand River Avenue were adjusted, as it is assumed that future traffic volumes would utilize the new Bond Street and Crescent Boulevard connections as “cut-thrus” to avoid congestion at the Novi Road/Grand River Avenue signal. Four turning movements were reassigned, as described, and previously approved by the City in the Flint Street Development Traffic Impact Study. The adjusted turning movements were as follows:

1. Northbound left-turn movement (5% reduction in traffic, shifted to Bond Street)
2. Eastbound right-turn movement (10% reduction in traffic, shifted to Bond Street)
3. Eastbound left-turn movement (5% reduction in traffic, shifted to Crescent Boulevard)
4. Southbound right-turn movement (10% reduction in traffic, shifted to Crescent Boulevard)

In addition, traffic counts were conducted at the two existing industrial driveways along the north side of Grand River Avenue at the Comau and General Filters developments. Traffic that currently accesses these developments directly from Grand River Avenue may utilize the new Crescent Boulevard connection (and Industrial Spur from Crescent Boulevard) in the future. Therefore, in the background analysis, applicable traffic to and from the east was reassigned to Crescent Boulevard and the Industrial Spur. Development traffic was reassigned based on existing turning movements at these driveways. For traffic travelling to/from the east on Grand River Avenue, it was assumed that 40% of this traffic was also to/from the north on Novi Road. Traffic assumed to be to/from the north on Novi Road was reassigned to the Novi Road/Crescent Boulevard intersection via Crescent Boulevard directly, and would thus bypass the Novi Road/Grand River Avenue intersection in the future.

The background (2028) conditions peak-hour intersection LOS results are shown in **Table 5**. The background (2028) conditions peak-hour traffic volumes and movement-by-movement LOS results are depicted in **Figure 6**. Capacity analysis reports from the *Synchro*® software for all intersections are included in **Appendix B-3**.

Table 5 – Background (2028) Conditions Intersection LOS Results

Intersection	Traffic Control	Weekday AM Peak-Hour		Weekday PM Peak-Hour		Saturday Midday Peak-Hour	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Novi Road and West Oaks Drive South	*Signalized*	14.9	B	30.8	C	43.4	D
Novi Road and WB I-96 Off-Ramp	*Signalized*	24.6	C	22.4	C	28.7	C
Novi Road and EB I-96 Off-Ramp	*Signalized*	10.4	B	14.1	B	22.4	C
Novi Road and Crescent Boulevard	*Signalized*	13.3	B	31.3	C	34.6	C
Novi Road and Grand River Avenue	*Signalized*	**72.5**	**E**	**72.7**	**E**	**88.3**	**F**
Novi Road and Bond Street/Main Street	*Signalized*	13.8	B	15.1	B	12.6	B
Novi Road and Trans X Road (WB approach results shown)	*1-Way STOP*	16.5	C	21.5	C	24.8	C
Novi Road and US Post Office Driveway	*Signalized*	3.7	A	5.2	A	4.3	A
Novi Road and Ten Mile Road	*Signalized*	37.8	D	54.2	D	36.6	D
Grand River Avenue and Bond Street/ Crescent Boulevard*	*Signalized**	7.0	A	11.0	B	8.0	A
Grand River Avenue and Sixth Gate (NB approach results shown)	*1-Way STOP*	9.7	A	20.2	C	16.1	C
Grand River Avenue and Main Street/ Town Center Drive	*Signalized*	13.4	B	25.3	C	23.5	C
Grand River Avenue and Meadowbrook Road	*Signalized*	27.9	C	**69.2**	**E**	42.0	D
Eleven Mile Road and Town Center Drive	*4-Way STOP*	8.6	A	15.4	B	11.3	B
Main Street and Potomac	*3-Way STOP*	7.7	A	8.2	A	8.6	A
Crescent Boulevard and Industrial Spur (EB approach results shown)	*1-Way STOP*	8.8	A	9.2	A	8.8	A

**Analysis assumes new traffic signal added at the Grand River Avenue intersection with Bond Street and Crescent Boulevard.*

As shown in Table 5, the background (2028) peak-hour capacity analysis shows that the Novi Road/Grand River Avenue intersection is projected to operate with a poor LOS during all three peak-hours. The intersection currently operates poorly during all three peak-hours, and intersection delay times are projected to increase when compared to existing conditions. In addition, the Grand River Avenue/Meadowbrook Road intersection is projected to operate poorly during the weekday afternoon peak-hour.

As shown on Figure 6, several large turning movements are projected to operate poorly under background (2018) conditions. Some of these movements are in addition to those occurring under existing conditions. These additional poorly operating movements include:

- At Novi Road/Grand River Avenue, the eastbound thru movement and the westbound right-turn movement.
- At Novi Road/Ten Mile Road, the westbound thru movement.
- At Grand River Avenue/Meadowbrook Road, the northbound left-turn movement.

4. Future (2028) Conditions

Section 4 contains an analysis of traffic conditions during the projected completion of all proposed developments (2028), including traffic generated by the future developments listed in Figure 1. Future conditions can be compared to background conditions to quantify the impact of the proposed developments.

4.1 Future Proposed Developments

The City of Novi is planning for the future development of eight different parcels within the study area network, in addition to those identified as “background”. With input from City Planning staff on expected projects and through discussions of potential land uses for vacant parcels, the future developments were assumed to include the following:

The **Adell Center** is proposed as a mixed-use development consisting of nine individual units. The development is located on the property of the former Novi Expo Center site west of Novi Road, south of I-96. The development is expected to have one main access point from Crescent Boulevard. The expected land uses for the site include:

- 180-Room Hotel
- 130-Room Business Hotel
- iFLY Indoor Skydiving (10,000 square feet)
- Health/Fitness Club (20,000 square feet)
- Carvana (7,500 square feet)
- Quality Restaurant (7,163 square feet)
- High-Turnover Sit-Down Restaurant (7,000 square feet)
- Open Space, Undeveloped Unit
- Existing Water Tower

The developer of the Adell Center provided trip generation estimates for each of the above land uses which were used as part of this study.

The **potential office/retail** space located at the southeast corner of Crescent Boulevard and Town Center Drive (currently an unused parking lot) is anticipated to be developed into general office use. A potential building size of 19,000 square feet was assumed for this parcel based on comparing the ratio of building-to-lot size (square footage) of similar general office buildings in Novi.

The **Main Street NW** parcel located on the east side of Novi Road, north of Main Street was assumed to be developed with a 6,000 square foot high-turnover sit-down restaurant. The size of the restaurant was determined based on comparing the ratio of building-to-lot size (square footage) of similar high-turnover sit-down restaurant in Novi.

The **Main Street North** parcel located on the north side of Main Street east of Novi Road was assumed to be a multi-family residential development consisting of 206 units. The development proposes on-street parking along Main Street and off-street parking north of the development. The development is assumed to have access to Main Street via a private drive on the west side of the site, east of the existing credit union as well as access to Grand River Avenue via Sixth Gate.

The **Asian Village** development is anticipated to be developed on the Anglin property on the north side of Grand River Avenue, east of Town Center Drive. The development may have up to three access points: one onto Grand River Avenue, one onto Town Center Drive and one along Eleven Mile Road. The potential land uses were based on publicly available news articles from Crain’s Detroit on 5/13/18 and ChinaDaily.com on 5/25/18. The following assumptions were used for the TIS analysis:

- 200 multi-family housing units
- 75,000 square foot shopping center (Lifestyle Center)
- 25,000 square foot food market
- 15,000 square feet of general office

The **Main Street Lofts** development is a multi-family residential development with 224 units. The parcel is located on the south side of Main Street, east of Novi Road. The development is proposed to have access points off of Main Street and Trans X Road.

The **City Park** development is proposed for the vacant parcel of land located on the east side of Novi Road and south side of Trans X Road. The park was assumed to be a public park and include a playground encompassing the 3.643 acres available. Access to the park was assume to be from Trans X Road.

The **Mirage Theater and Retail** development is located on the west side of Novi Road, north of Ten Mile Road. The land uses within the development include 20,000 square feet of retail, restaurants, or office uses and a 773 seat movie theater. The development was assumed to have two access points off of Novi Road.

4.2 Trip Generation

The proposed trip generation for the eight future developments is shown in **Table 6.** Traffic generated by the proposed developments was used to measure the impact of the developments on the study area intersections for the future (2028) conditions. Assumptions were made in cases where land use data was not available in the ITE Trip Generation Manual or data was provided from a recent trip generation analysis.

Future (2028) Trip Generation Assumptions (with development name in parentheses):

- iFly (Adell Center) – Saturday trips based on the Kimberley-Horn report appendix.
- Carvana (Adell Center) – Saturday data not available, assume same trips as weekday PM peak-hour.
- All land uses (Asian Village) - Crain's Detroit, 5/13/18 article; and China Daily.com 5/25/18 article http://www.ecns.cn/news/society/2018-05-25/detail-ifyuqkxh5546517.shtml
- Multi-family housing (Mainstreet Lofts) - Trips based on data in the AECOM 09/13/17 memorandum to the City
- Playground (City Park) - Very small city park, ITE Trip Generation 10th Edition does not compute trips for a park of this size. Nominal trips are assumed.
- Movie Theatre (Theatre & Retail) - Based on total number of seats

Pass-By Site Trips

As with The Bond background development, it is anticipated that future retail-oriented developments will capitalize on the traffic volumes along Novi Road and Grand River Avenue by “capturing” customers passing by the location to/from work or other destinations. While pass-by trips do not add new trips to the roadway network, they add turning movements at the site driveway locations.

Based on the ITE pass-by trip data, it is estimated that approximately 10% to 40% of peak-hour trips for each of the three peak-hours are pass-by trips for the retail-type land uses. **Table 7** summarizes the pass-by trip percentages for these applicable land uses.

Internal Site Trips

Some of the proposed developments will also attract internal trips. Internal trips are common between two or more trip generators on the same site, and are common for a development with adjacent businesses like the restaurant and hotel land uses in the Adell Center development. An internal trip occurs when a patron visits two or more land uses that can be accessed from the same parking area (i.e. there is no need to enter the main roadway when going from land use to land use).

For numerous land uses, the ITE Trip Generation Manual provides data for internal trips for selected peak-hours, including many of the land uses in the present study. Some of the land uses for the Adell Center, Asian Village, and the shopping center in the Mirage Theater and Retail development are of the types that involve internal trips. Based on the ITE internal trip data, it is estimated that approximately 10% to 30% of peak-hour trips for these land uses are internal trips. Table 7 summarizes the internal trip percentages for applicable land uses. For those land uses that show internal trip percentages in Table 7, their respective trips shown in Table 6 include this reduction in total trips based on their internal trip percentage.

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Table 6 – Future (2028) Trip Generation

Development #	Development Name	Land Use Description	ITE Land Use	ITE LUC	Size	Units	Weekday AM Peak-Hour Trips			Weekday PM Peak-Hour Trips			Saturday Peak-Hour Trips		
							Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
1	Adell Center	Hotel	**Hotel**	**310**	**180**	rooms	50	35	**85**	50	48	**98**	65	51	**116**
		Business Hotel	**Business Hotel**	**312**	**130**	rooms	21	30	**51**	21	17	**38**	25	27	**52**
		I-Fly (indoor skydiving)	**none**	**n/a**	**10,000**	SF	4	0	**4**	24	22	**46**	27	37	**64**
		Health / Fitness Club	**Health / Fitness Club**	**492**	**20,000**	SF	13	13	**26**	39	30	**69**	31	33	**64**
		Carvana (on-line used car dealer)	**none**	**n/a**	**7,500**	SF	6	6	**12**	6	6	**12**	6	6	**12**
		Quality Restaurant	**Quality Restaurant**	**931**	**7,163**	SF	4	1	**5**	34	16	**50**	40	28	**68**
		Hi-Turnover Restaurant	**High-Turnover Sit-Down Restaurant**	**932**	**7,000**	SF	4	1	**5**	38	23	**61**	36	34	**70**
2	currently unused parking lot	General Office	**General Office**	**710**	**19,000**	SF	38	6	**44**	4	20	**24**	5	5	**10**
3	Main Street NW	Restaurant	**High-Turnover Sit-Down Restaurant**	**932**	**6,000**	SF	33	27	**60**	36	23	**59**	34	33	**67**
4	Main Street North	Residential	**Multi-Family Housing (Mid-Rise)**	**221**	**206**	units	18	51	**69**	54	35	**89**	45	48	**93**
5	Asian Village (mixed use)	Residential	**Multi-Family Housing (Mid-Rise)**	**221**	**200**	units	18	50	**68**	52	34	**86**	44	47	**91**
		Lifestyle Center	**Shopping Center**	**820**	**75,000**	SF	88	46	**134**	74	84	**158**	30	26	**56**
		Food Market	**Supermarket**	**850**	**25,000**	SF	49	33	**82**	113	109	**222**	92	89	**181**
		Office	**General Office**	**710**	**15,000**	SF	35	6	**41**	3	16	**19**	4	4	**8**
6	Mainstreet Lofts		**Multi-Family Housing (Mid-Rise)**	**221**	**224**	units	19	56	**75**	59	37	**96**	49	52	**101**
7	City Park	playground	**Public Park**	**411**	**3.643**	acres				5	5	**10**	10	10	**20**
8	Theater & Retail (see Mirage Cinema Development info)	Theater	**Movie Theater**	**445**	**773**	seats				22	40	**62**	50	20	**70**
		Shopping Center	**Shopping Center**	**820**	**20,000**	SF				79	86	**165**	47	43	**90**
Total NET NEW Peak-Hour Trips							400	361	**761**	713	651	**1364**	640	593	**1233**
							AM Peak Hour			**PM Peak Hour**			**Sat Peak Hour**		

Source: ITE Trip Generation Manual, 10th Ed & ITE Trip Generation Handbook, 3rd Ed

Assumes no AM trip gen (not open)

Table 7 – Future (2028) Pass-By and Internal Trips

							Pass-By Trip Percentages			Internal Trip Percentages		
Development #	Development Name	Land Use Description	ITE Land Use	ITE LUC	Size	Units	AM	PM	SAT	AM	PM	SAT
1	Adell Center	Hotel	**Hotel**	**310**	**180**	rooms					**10%**	**10%**
		Business Hotel	**Business Hotel**	**312**	**130**	rooms					**10%**	**10%**
		iFly (indoor skydiving)	**none**	**n/a**	**10,000**	SF					**15%**	**15%**
		Health / Fitness Club	**Health / Fitness Club**	**492**	**20,000**	SF						
		Carvana (on-line used car dealer)	**none**	**n/a**	**7,500**	SF						
		Quality Restaurant	**Quality Restaurant**	**931**	**7,163**	SF		**40%**	**30%**		**10%**	**10%**
		Hi-Turnover Restaurant	**High-Turnover Sit-Down Restaurant**	**932**	**7,000**	SF		**40%**	**30%**		**10%**	**10%**
2	currently unused parking lot	General Office	**General Office**	**710**	**19,000**	SF						
3	Main Street NW	Restaurant	**High-Turnover Sit-Down Restaurant**	**932**	**6,000**	SF	**20%**	**40%**	**30%**			
4	Main Street North	Residential	**Multi-Family Housing (Mid-Rise)**	**221**	**206**	units						
5	Asian Village (mixed use)	Residential	**Multi-Family Housing (Mid-Rise)**	**221**	**200**	units						
		Lifestyle Center	**Shopping Center**	**820**	**75,000**	SF	**10%**	**30%**	**20%**	**15%**	**20%**	**30%**
		Food Market	**Supermarket**	**850**	**25,000**	SF	**10%**	**30%**	**20%**	**15%**	**20%**	**30%**
		Office	**General Office**	**710**	**15,000**	SF						
6	Mainstreet Lofts		**Multi-Family Housing (Mid-Rise)**	**221**	**224**	units						
7	City Park	playground	**Public Park**	**411**	**3.643**	acres						
8	Theater & Retail (Mirage Cinema Development info)	Theater	**Movie Theater**	**445**	**773**	seats					**10%**	**10%**
		Shopping Center	**Shopping Center**	**820**	**20,000**	SF		**30%**	**20%**		**10%**	**10%**

Source: ITE Trip Generation Manual, 10th Ed & ITE Trip Generation Handbook, 3rd Ed

Assumes pass-by trips for these land uses are not applicable.

4.3 Trip Distribution and Traffic Assignment

Future development generated trips were assigned to the roadway network using the same distribution percentages assumed for the background development trips. The traffic generated by the eight future developments was assigned to the roadway network based on the determined trip distribution percentages. The total future development traffic that would be added to the roadway network is shown in **Figure 7**. Traffic volumes for each of the eight individual developments are shown separately in **Figures 7A to 7H**.

As shown in Figure 7, several turning movements in the study area will experience an increase in traffic due to trips generated by future developments. Significant increases include:

1. Westbound I-96 off-ramp left-turn movement at Novi Road
2. Southbound Novi Road thru movement at Grand River Avenue
3. Northbound Novi Road thru movement at Grand River Avenue

4.4 Future (2028) Conditions Capacity Analysis

A capacity analysis was conducted for the study area intersections under future (2028) traffic conditions. The future (2028) analysis did not include any additional changes to the roadway network, beyond the Bond Street and Crescent Boulevard new ring road improvements that were introduced in the background (2028) analysis. The future analysis did consider "cut-thru" traffic avoiding congestion at the Novi Road/Grand River Avenue signal.

The future (2028) conditions peak-hour intersection LOS results are shown in **Table 8**. The future (2028) conditions peak-hour traffic volumes and movement-by-movement LOS results are depicted in **Figure 8**. Capacity analysis reports from the *Synchro*® software for all intersections are included in **Appendix B-4**.

Table 8 – Future (2028) Conditions Intersection LOS Results

Intersection	Traffic Control	Weekday AM Peak-Hour		Weekday PM Peak-Hour		Saturday Midday Peak-Hour	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Novi Road and West Oaks Drive South	*Signalized*	14.7	B	30.9	C	44.6	D
Novi Road and WB I-96 Off-Ramp	*Signalized*	24.8	C	22.8	C	31.9	C
Novi Road and EB I-96 Off-Ramp	*Signalized*	10.4	B	14.8	B	25.9	C
Novi Road and Crescent Boulevard	*Signalized*	16.6	B	35.6	D	40.7	D
Novi Road and Grand River Avenue	*Signalized*	**100.3**	**F**	**111.7**	**F**	**133.6**	**F**
Novi Road and Bond Street/Main Street	*Signalized*	19.8	B	18.9	B	15.2	B
Novi Road and Trans X Road (WB approach results shown)	*1-Way STOP*	18.2	C	27.5	D	27.0	D
Novi Road and US Post Office Driveway	*Signalized*	3.5	A	4.9	A	4.2	A
Novi Road and Ten Mile Road	*Signalized*	39.8	D	**69.0**	**E**	40.9	D
Grand River Avenue and Bond Street/ Crescent Boulevard*	*Signalized**	9.8	A	16.7	B	13.4	B
Grand River Avenue and Sixth Gate (NB approach results shown)	*1-Way STOP*	13.3	B	30.8	D	34.7	D
Grand River Avenue and Main Street/ Town Center Drive	*Signalized*	15.7	B	34.6	C	29.5	C
Grand River Avenue and Meadowbrook Road	*Signalized*	28.6	C	**83.2**	**F**	47.9	D
Eleven Mile Road and Town Center Drive	*4-Way STOP*	9.1	A	17.3	C	11.8	B
Main Street and Potomac	*3-Way STOP*	7.9	A	8.5	A	9.0	A
Crescent Boulevard and Industrial Spur (EB approach results shown)	*1-Way STOP*	9.2	A	9.9	A	9.6	A

**Analysis assumes new traffic signal added at the Grand River Avenue intersection with Bond Street and Crescent Boulevard.*

As shown in Table 8, the future (2028) peak-hour capacity analysis shows that the Novi Road/Grand River Avenue intersection is projected to operate with a poor LOS F during all three peak-hours, as is the case with the existing and background conditions. In addition, the Novi Road/Ten Mile Road and Grand River Avenue/Meadowbrook Road intersections are projected to operate poorly during the weekday afternoon peak-hour. The Grand River

Avenue/Meadowbrook Road intersection was already projected to operate poorly during the weekday afternoon peak-hour under background conditions.

As shown on Figure 8, several large turning movements are projected to operate poorly under future (2028) conditions. Some of these movements are in addition to those occurring under existing and background conditions. These additional poorly operating movements include:

- At Novi Road/Crescent Boulevard, the eastbound left-turn movement.
- At Grand River Avenue/Crescent Boulevard, the southbound left-turn movement.
- At Novi Road/Grand River Avenue, the southbound thru and right-turn movements.
- At Novi Road/Ten Mile Road, the southbound thru and right-turn movements.

5. Potential Future Mitigation

Section 5 contains a discussion of potential mitigation options that could improve the operation of intersections and traffic movements that are projected to operate poorly under future (2028) conditions after all study developments are implemented. Varying levels of mitigation options were examined based on input from the City. The mitigation recommendations were grouped into the following 'categories':

1. Signal timing adjustments
2. Traffic diversion via Taft Road and potential Fountain Walk Avenue connections
3. Roadway improvements within existing rights-of-way
4. Transit opportunities

5.1 Signal Timing Adjustments

The potential mitigation solution that is least expensive, and least invasive, is to adjust signal timings at the study area intersections. The signals in the study area currently operate on RCOC's SCATS system. The SCATS system produces traffic-responsive signal timings that adjust in real time based on the traffic volumes. The system provides for coordinated timings between signals along the Novi Road and Grand River Avenue corridors. Since the signal system already operates fully-actuated in real time, there is very little potential to improving signal operations based on signal timings alone. However, an existing timing optimization analysis was conducted to review if signal timing adjustments could improve operations. AECOM tested split adjustments at intersections with poorly operating traffic movements. Some small improvements were achieved by using timing adjustments as a mitigation measure.

An analysis of signal timing adjustments for future conditions produced incremental improvements for a few large traffic movements in the study area. These movements include:

- At Novi Road/Westbound I-96 off-ramp, the westbound left-turn movement.
- At Novi Road/Crescent Boulevard, the eastbound left-turn movement.
- At Novi Road/Ten Mile Road, the eastbound and northbound left-turn movements.

The signal timing adjustment opportunities will be coordinated with the RCOC and considered for implementation, as deemed necessary.

5.2 Taft Road/Fountain Walk Avenue Connection

A good portion of traffic utilizing the Novi Road and Grand River Avenue corridors is travelling to and from the West Oaks and Twelve Oaks shopping centers on the north side of I-96. Similarly, it is assumed that a significant portion of the traffic within the study area is traveling between the residential areas to the south and west of the study area to the shopping districts and freeway interchange within the study area. Therefore, an alternative connection between the two areas could be considered. The connection of Taft Road over the I-96 expressway, and a subsequent connection of Fountain Walk Avenue to Taft Road over the railroad (and up to Twelve Mile Road), as shown in the City's Master Plan,

could provide another point of access to these shopping centers and freeway interface from the residential areas of Novi to the south and west. Refer to **Figure 9** for a schematic concept drawing. These connections could ease the traffic burden placed on Novi Road and Grand River Avenue in the Town Center vicinity, including specific traffic movements such as the eastbound Grand River Avenue left-turn onto northbound Novi Road and the southbound Novi Road right-turn onto westbound Grand River Avenue. Similarly, these connection roadways could ease the burden on the eastbound Ten Mile Road left-turn onto northbound Novi Road, and the southbound Novi Road right-turn onto westbound Ten Mile Road.

Connection of these roadways would incur a significant cost. However, these costs would be on par with purchasing right-of-way along the Novi Road corridor that may be required to otherwise increase capacity of the corridor.

The future (2028) condition capacity analysis showed that three study area intersections are projected to operate over capacity. A preliminary diversion analysis was conducted to determine what level of traffic would need to be diverted away from the study area to allow these intersections to operate within capacity in the future. This iterative analysis showed the following diversions would be required:

1. Novi Road/Grand River Avenue – 25% diversion required under AM, PM and Saturday peak periods
2. Novi Road/Ten Mile Road – 10% diversion required under the PM peak period
3. Grand River Avenue/Meadowbrook Road – 15% diversion required under the PM peak period

A more detailed analysis, such as an origin-destination study, would need to be conducted to determine the extent of traffic in the study area travelling to/from the southwest portion of the city to the West Oaks and Twelve Oaks shopping centers or I-96/Novi Road interchange and would therefore be inclined to utilize the alternative Taft Road (and/or subsequent Fountain Walk Avenue) connections. However, it would seem that a 25% diversion may be ambitious, and that alternative mitigation measures should be examined as well.

5.3 Potential Roadway Improvements

Roadway improvements at key locations could provide the additional capacity to allow the study area intersections to operate acceptably in the future. However, some improvements would incur large costs in acquiring additional right-of-way. Based on the projected poorly operating intersections and traffic movements in the future, the following roadway improvements should be considered.

Novi Road/Grand River Avenue – add dual left-turn lanes on all approaches, and a southbound right-turn lane.

This intersection operates over capacity during all three peak periods under existing conditions, and the addition of traffic generated by future developments worsens this situation. The existing left-turn volumes at this intersection are 140 vehicle or higher during the peak-hours. The eastbound left-turn movement is currently 420 vehicles during the weekday morning peak-hour. All four left-turn movements are projected to be more than 200 vehicles during at least one peak-hour under future (2028) conditions.

In addition, the southbound right-turn movement is currently 300 vehicles during the Saturday midday peak-hour. Despite this being the largest right-turn movement at the intersection, there is no southbound right-turn lane at this intersection. The addition of a southbound right-turn lane, with overlapping right-turn green arrow operation, would improve the operation of this intersection. Refer to **Figure 10A** for a concept map showing these improvements.

However, the recommended improvements at this intersection are restricted by limited right-of-way in all four quadrants of this intersection. Purchase of the necessary right-of-way would be costly and invasive to existing businesses at this intersection. Therefore, widening of this intersection does not appear to be feasible and, therefore, was not included as part of the capacity analysis.

Novi Road/Ten Mile Road – add dual left-turn lanes on all approaches, and a southbound right-turn lane.

This intersection is projected to operate over capacity during the weekday afternoon peak-hour under future conditions. The same capacity issues that occur at Novi Road/Grand River Avenue, also occur at this intersection but to a lesser extent.

Four-way dual left-turn lanes, plus a southbound right-turn lane would allow this intersection to operate acceptably under future conditions. Unlike the Grand River Avenue intersection, this intersection appears to have sufficient right-of-way to accommodate widening of the intersection, therefore these recommendations are included in the capacity analysis. Refer to **Figure 10B** for a concept map showing these improvements.

The Ten Mile corridor from Napier Road to Haggerty Road is currently being reviewed under a separate study. If Ten Mile Road were to be widened in the future, the intersection of Novi Road at Ten Mile Road could be enhanced with suggested mitigation measures at the same time.

Grand River Avenue/Meadowbrook Road – add northbound dual left-turn lanes

Under future traffic conditions, the northbound Meadowbrook Road left-turn movement at Grand River Avenue is projected to contain approximately 300 vehicles during the weekday afternoon and Saturday midday peak-hours. This is an increase from approximately 180-190 vehicles under existing conditions. This projected increase is due to the proposed developments near this intersection. Dual northbound left-turn lanes could allow this intersection to operate acceptably under future conditions. This recommendation is included in the capacity analysis. Refer to **Figure 10C** for a concept map showing these improvements.

Grand River Avenue/Main Street/Town Center Drive – add north/south right-turn green arrows to signal

The northbound and southbound right-turn movements at this intersection are both projected to have increased traffic volumes due to proposed future developments in the area. The addition of right-turn green arrows would be a relatively easy addition, as the north/south approaches already have exclusive right-turn lanes, and the right-turn green arrows could operate as overlaps to the existing east/west Grand River Avenue left-turn phases. This recommendation is included in the capacity analysis. Refer to **Figure 10D** for a concept map showing these improvements.

Grand River Avenue – widen to five lanes from Meadowbrook Road to Novi Road

The projected increase in development along Grand River Avenue between Main Street/Town Center Drive and Meadowbrook Road would lend itself to a future roadway widening. Many of the parcels in this area are currently undeveloped. Grand River Avenue currently has a variable cross-section ranging from three lanes to five lanes along this stretch of roadway, including some extended right-turn bays or deceleration lanes. Therefore, the roadway widening would not be extensive along a good portion of this section. There appears to be ample right-of-way to accommodate this widening. The second eastbound Grand River Avenue thru lane could be constructed as a right-turn lane at Meadowbrook Road, so no widening would be necessary to the east of Meadowbrook Road. This recommendation is included in the capacity analysis. Refer to **Figure 10D** for a concept map showing these improvements.

5.4 Transit Opportunities

Another option for potentially improving traffic operations within the area is to provide alternate ride-sharing opportunities for motorists, which would in turn reduce the number of individual trips on the roadway network. Ride-share opportunities could include services such as Uber, Lyft, autonomous shuttles, transit connectors, etc. The City has expressed interest in exploring transit connector options between the shopping districts to the north and south of the I-96 freeway, as recommended in the 2016 Thoroughfare Master Plan. Additional transit connections could be explored beyond the immediate study area to capture some repetitive and recurring trips between various locations such as large residential populations, the Providence Park hospital or the Suburban Collection Showplace. In order to assess the practicality of transit solutions, the City could consider conducting an origin-destination study to determine where potential transit stop locations may fit and the volume of customers that may be expected to utilize the systems. Ride-sharing and transit opportunity impacts were not included in the capacity analysis of this study.

5.5 Future (2028) Conditions Capacity Analysis (with Mitigation)

A capacity analysis was conducted for the study area intersections under future (2028) traffic conditions with recommended roadway improvements in place. The capacity analysis included all of the roadway improvements listed in the previous section, except for suggestions at the intersection of Novi Road and Grand River Avenue due to right-

of-way limitations, and as directed by the City. The capacity analysis included timing changes to account for laneage modifications included in the mitigation recommendations.

The future (2028) conditions (with mitigation) peak-hour intersection LOS results are shown in **Table 9**. The future (2028) conditions (with mitigation) peak-hour traffic volumes and movement-by-movement LOS results are depicted in **Figure 11**. Capacity analysis reports from the *Synchro*® software for all intersections are included in **Appendix B-5**.

Table 9 – Future (2028) Conditions (with Mitigation) Intersection LOS Results

Intersection	Traffic Control	Weekday AM Peak-Hour		Weekday PM Peak-Hour		Saturday Midday Peak-Hour	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Novi Road and West Oaks Drive South	*Signalized*	14.6	B	30.7	C	43.9	D
Novi Road and WB I-96 Off-Ramp	*Signalized*	25.4	C	23.3	C	29.9	C
Novi Road and EB I-96 Off-Ramp	*Signalized*	10.4	B	15.2	B	25.3	C
Novi Road and Crescent Boulevard	*Signalized*	19.0	B	35.0	C	36.5	D
Novi Road and Grand River Avenue	*Signalized*	**95.8**	**F**	**95.0**	**F**	**103.5**	**F**
Novi Road and Bond Street/Main Street	*Signalized*	19.7	B	19.0	B	15.2	B
Novi Road and Trans X Road (WB approach results shown)	*1-Way STOP*	18.2	C	27.5	D	27.0	D
Novi Road and US Post Office Driveway	*Signalized*	3.5	A	4.9	A	4.1	A
Novi Road and Ten Mile Road	*Signalized*	40.6	D	47.6	D	36.8	D
Grand River Avenue and Bond Street/ Crescent Boulevard	*Signalized*	9.9	A	15.9	B	13.8	B
Grand River Avenue and Sixth Gate (NB approach results shown)	*1-Way STOP*	12.5	B	12.9	B	12.8	B
Grand River Avenue and Main Street/ Town Center Drive	*Signalized*	14.9	B	27.3	C	26.2	C
Grand River Avenue and Meadowbrook Road	*Signalized*	31.7	C	44.9	D	36.0	D
Eleven Mile Road and Town Center Drive	*4-Way STOP*	9.1	A	17.3	C	11.8	B
Main Street and Potomac	*3-Way STOP*	7.9	A	8.5	A	9.0	A
Crescent Boulevard and Industrial Spur (EB approach results shown)	*1-Way STOP*	9.2	A	9.9	A	9.6	A

As shown in Table 9, with roadway modifications (and corresponding signal timing adjustments) included in the future conditions analysis, the Novi Road/Ten Mile Road and Grand River Avenue/Meadowbrook Road intersections are both projected to operate with improved (and acceptable) intersection LOS during the weekday afternoon peak-hour. However, the Novi Road/Grand River Avenue intersection is still projected to operate poorly during all three peak-hours.

As shown on Figure 11, many poorly operating turning movements are projected to operate with improved LOS, with roadway improvements assumed to be in place. This is primarily true at the Novi Road/Ten Mile Road and Grand River Avenue/Meadowbrook Road intersections.

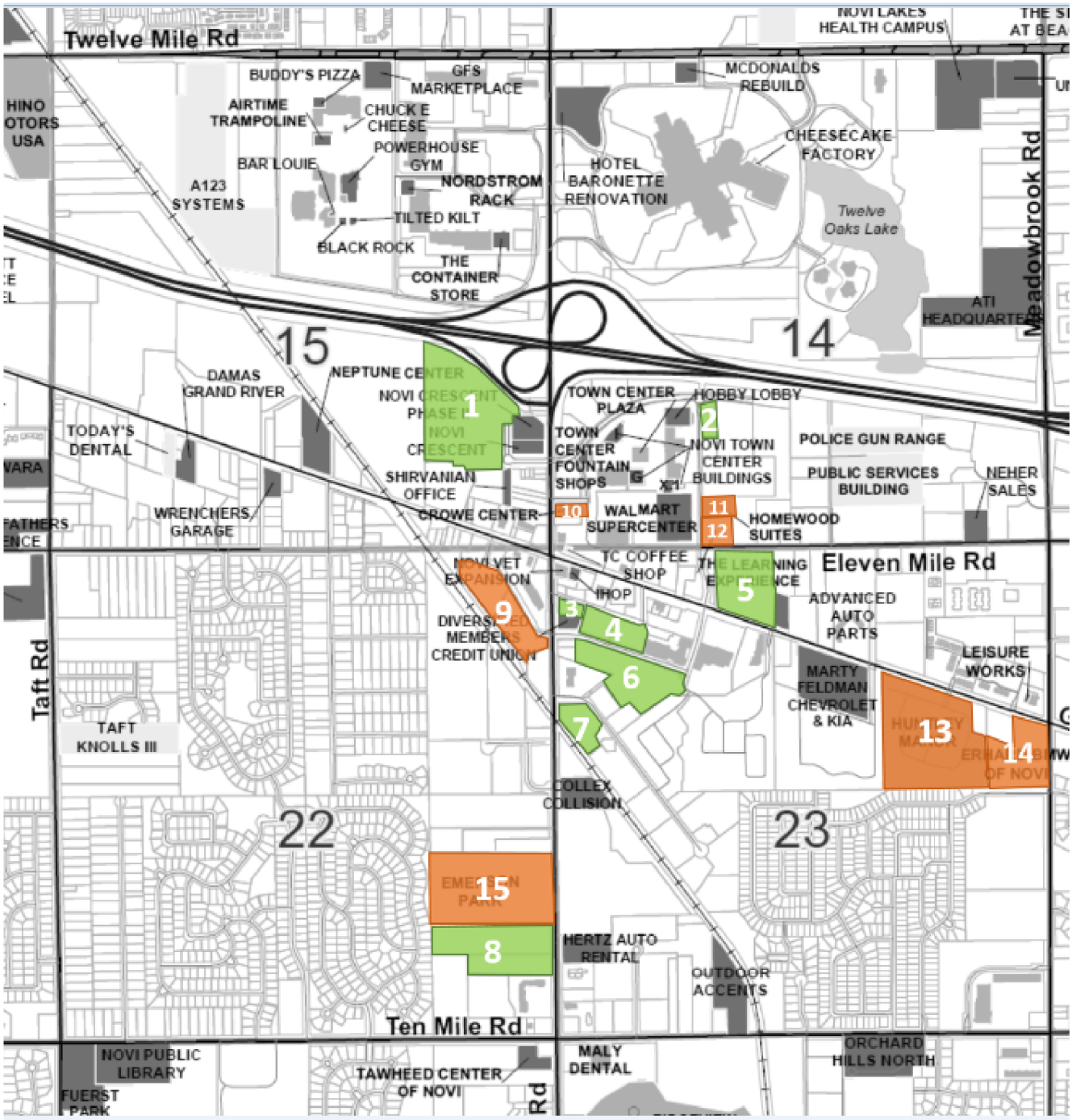
6. Conclusions

The large Town Center area within the city of Novi is expected to experience additional development over the next ten years. The study examined the traffic operations of the roadways during existing (2018) conditions, and with the anticipated traffic impacts of 15 background and future developments in the horizon year of 2028. The analysis concluded that the intersection of Novi Road and Grand River Avenue operates with an unacceptable LOS under

existing conditions. Additionally, several other individual turning movements operate poorly within the study area under existing conditions. Signal timing adjustments show incremental improvements; however, because of the existing operation of RCOC's SCATS system, signal timing impacts are minimal.

The addition of background and future development traffic will impact the study area intersections and cause additional intersections to operate below acceptable LOS, including Novi Road/Ten Mile Road and Grand River Avenue/Meadowbrook Road. Several individual turning movements are projected to operate poorly under future (2028) conditions as well.

The study offers varying levels of mitigation opportunities including signal timing adjustments, lane additions, roadway connections over the I-96 expressway, and local transit services. The signal timing and lane adjustments were analyzed as part of this study, as discussed in Section 5. The Taft Road/Fountain Walk Avenue connections and transit opportunities were discussed qualitatively because additional investigation is required to determine the effectiveness and feasibility of those solutions. Implementation of the mitigation measures as discussed in Section 5 could result in improved intersection LOS to acceptable levels at all study intersections, except for the intersection of Novi Road and Grand River Avenue where right-of-way is limited and other options should be considered.



Future Developments

1 – Adell Center
2 – Potential Retail/Office
3 – Main Street NW
4 – Main Street North
5 – Asian Village
6 – Mainstreet Lofts
7 – City Park
8 – Mirage Theater & Retail

Background Developments

9 – The Bond Development
10 – Crowe Center
11 – Homewood Suites
12 – The Learning Experience
13 – Huntley Manor
14 – Erhard Jaguar/Land Rover
15 – Emerson Park

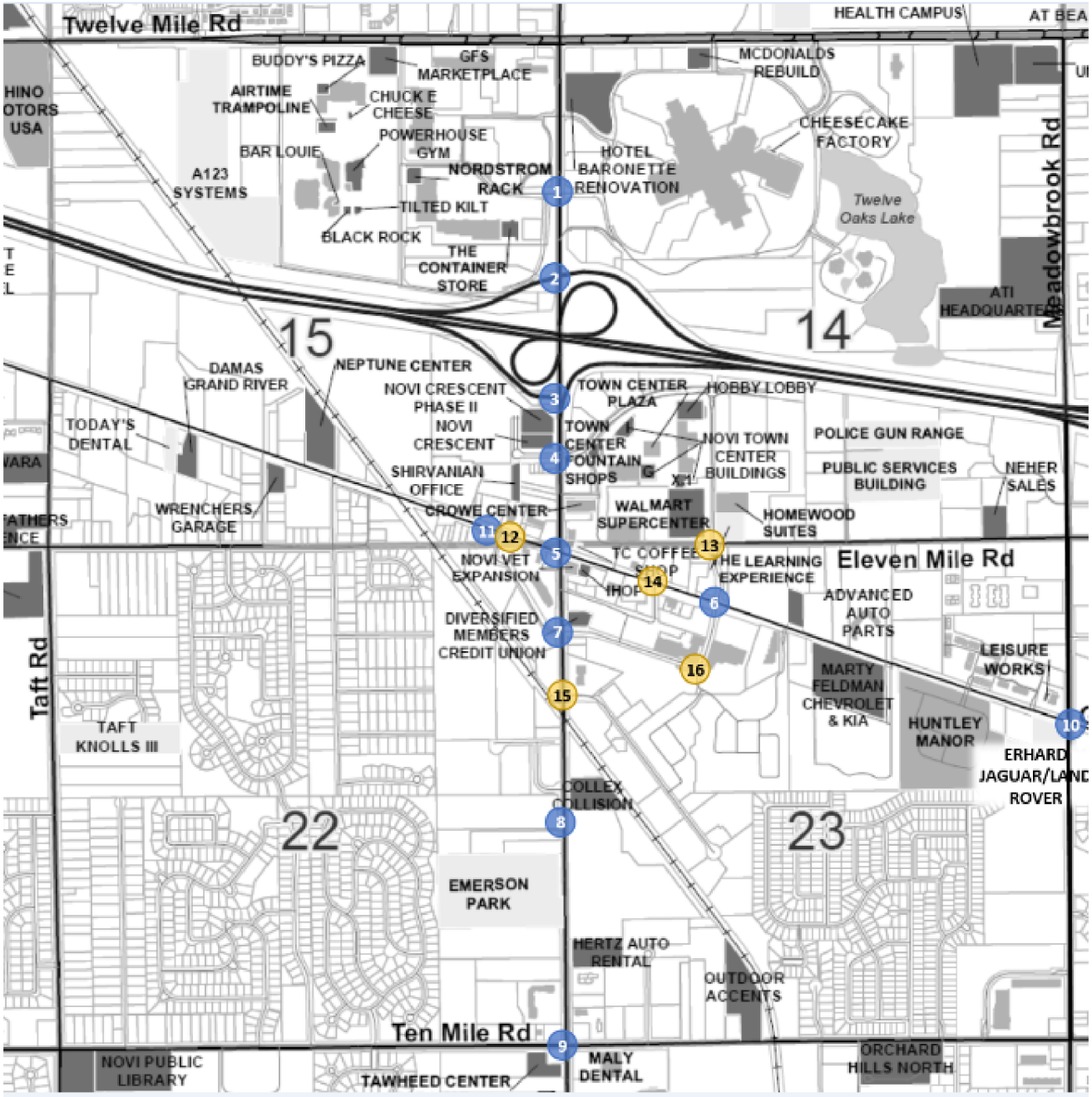
NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

AECOM

STUDY AREA DEVELOPMENTS

FIGURE 1

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-1_Study Area Developments



Signalized Study Intersections

1 – Novi Road and West Oaks Dr S
2 – Novi Road and WB I-96 Off Ramp
3 – Novi Road and EB I-96 Off Ramp
4 – Novi Road and Crescent Boulevard
5 – Novi Road and Grand River Avenue
6 – Grand River Avenue and Main Street
7 – Novi Road and Flint Street/Main Street
8 – Novi Road and Post Office Driveway
9 – Novi Road and Ten Mile Road
10 – Grand River Avenue and Meadowbrook
11 – Grand River Avenue and Crescent Blvd/Flint Street (proposed)

Unsignalized Study Intersections

12 – Grand River Avenue and existing Flint Street
13 – Eleven Mile Road and Town Center Dr
14 – Grand River Avenue and Sixth Gate
15 – Novi Road and Trans X
16 – Main Street and Main Street/Potomac

*Additional site driveways will be included as necessary for purposes of identifying mitigation measures.

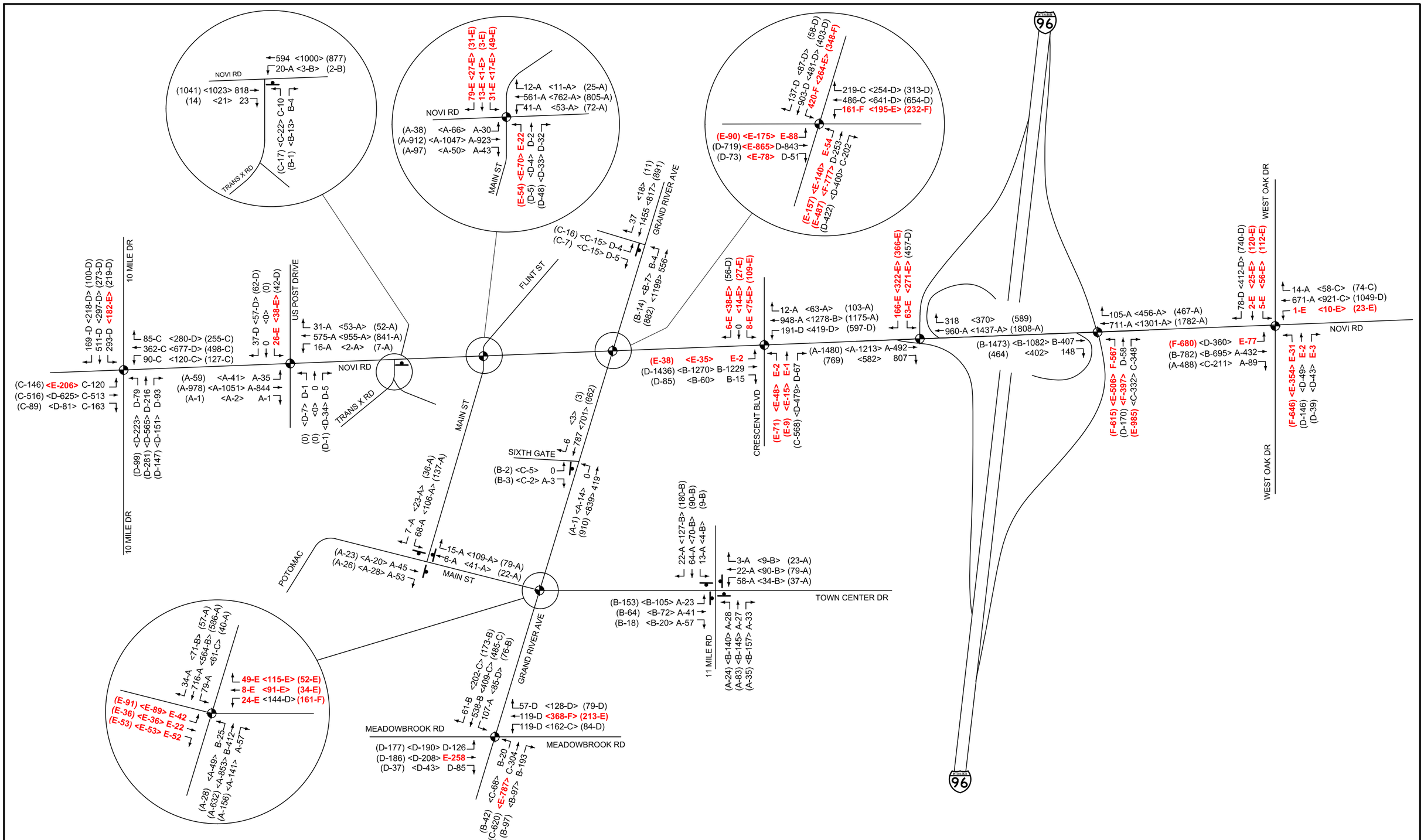
NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

AECOM

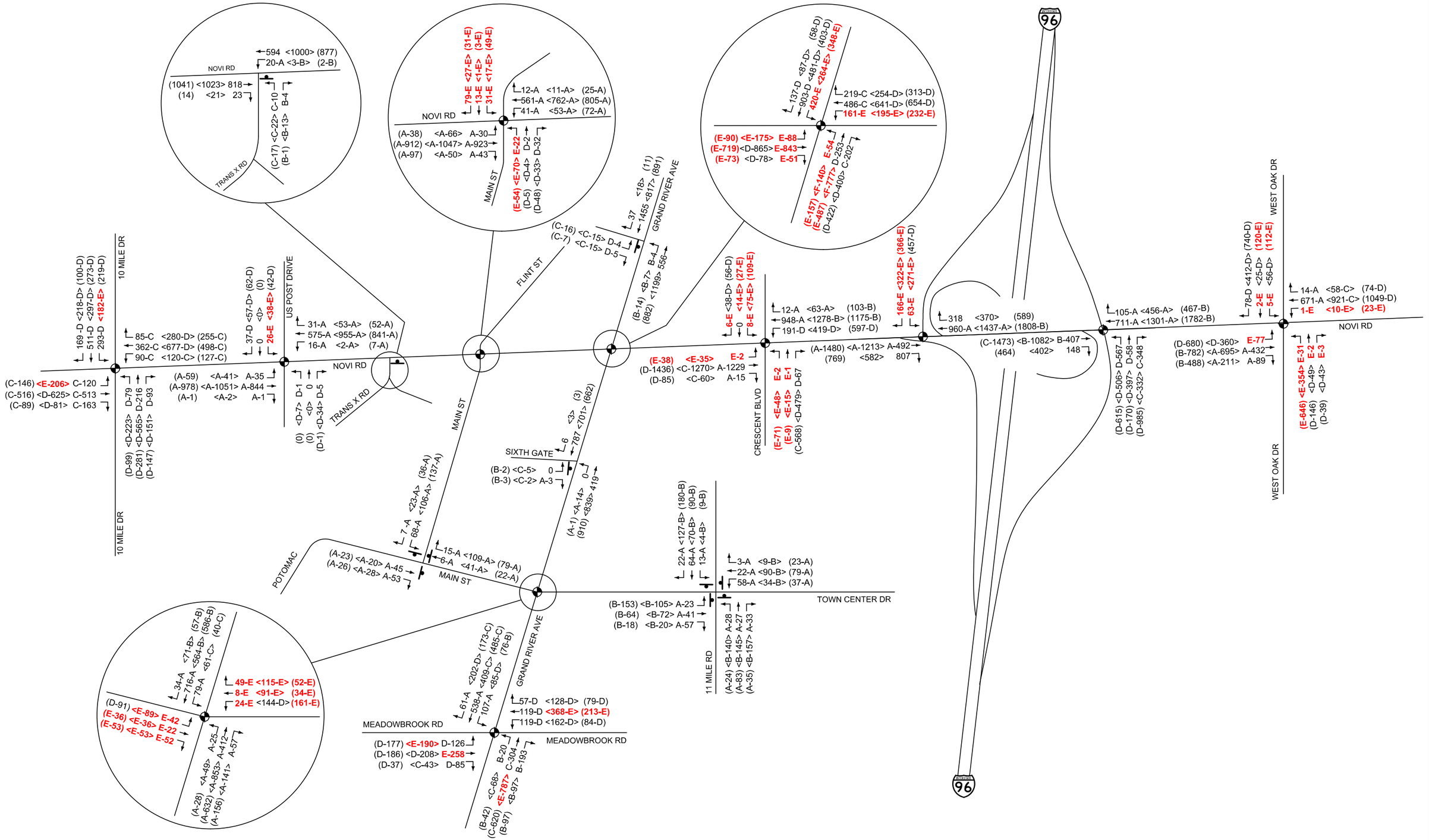
STUDY AREA INTERSECTIONS

FIGURE 2

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-2_Study Area Intersections



	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM	- TRAFFIC SIGNAL - STOP SIGN - LANE MOVEMENT XXX-X - AM-PEAK WEEKDAY TRAFFIC VOLUME & LOS <XXX-X> - PM-PEAK WEEKDAY TRAFFIC VOLUME & LOS (XXX-X) - SATURDAY PEAK TRAFFIC VOLUME & LOS	EXISTING (2018) AM, PM AND SATURDAY PEAK-HOUR VOLUMES AND LEVELS OF SERVICE	FIGURE 3


NOVI RD
10 MILE DR
US POST DRIVE
TRANS X RD
MAIN ST
FLINT ST
GRAND RIVER AVE
CRESCENT BLVD
SIXTH GATE
POTOMAC
TOWN CENTER DR
11 MILE RD
MEADOWBROOK RD
WEST OAK DR
I-96
(C-146) <E-206> C-120
(C-516) <D-625> C-513
(C-89) <D-81> C-163
169 -D <218-D> (100-D)
511-D <297-D> (273-D)
293-D <182-E> (219-D)
85-C <280-D> (255-C)
362-C <677-D> (498-C)
90-C <120-C> (127-C)
37-D <57-D> (62-D)
0 <0> (0)
26-E <38-E> (42-D)
31-A <53-A> (52-A)
575-A <955-A> (841-A)
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(0) <D-7> D-1
(0) <0> 0
(D-1) <D-34> D-5
(C-16) <C-15> D-4
(C-7) <C-15> D-5
37 <18> (11)
1455 <817> (891)
(B-14) <B-7> B-4
(882) <1199> 556
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(D-1436) <C-1270> A-1229
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12-A <63-A> (103-B)
948-A <1278-B> (1175-B)
191-D <419-D> (597-D)
E-2
E-1
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(D-985) <C-332> C-348
(D-680) <D-360> E-77
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(D-39) <D-43> E-3
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(A-83) <B-145> A-27
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A-412 A-57
(A-28)
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B-20 C-304 B-193
(B-42) <C-68> <E-787> <B-97>
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903-D <481-D> (403-D)
420-E <264-E> (348-E)
219-C <254-D> (313-D)
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(E-719) <D-865> E-843
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(E-487) <F-177> D-253
(D-422) <D-400> C-202
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31-E <17-E> (49-E)
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561-A <762-A> (805-A)
41-A <53-A> (72-A)
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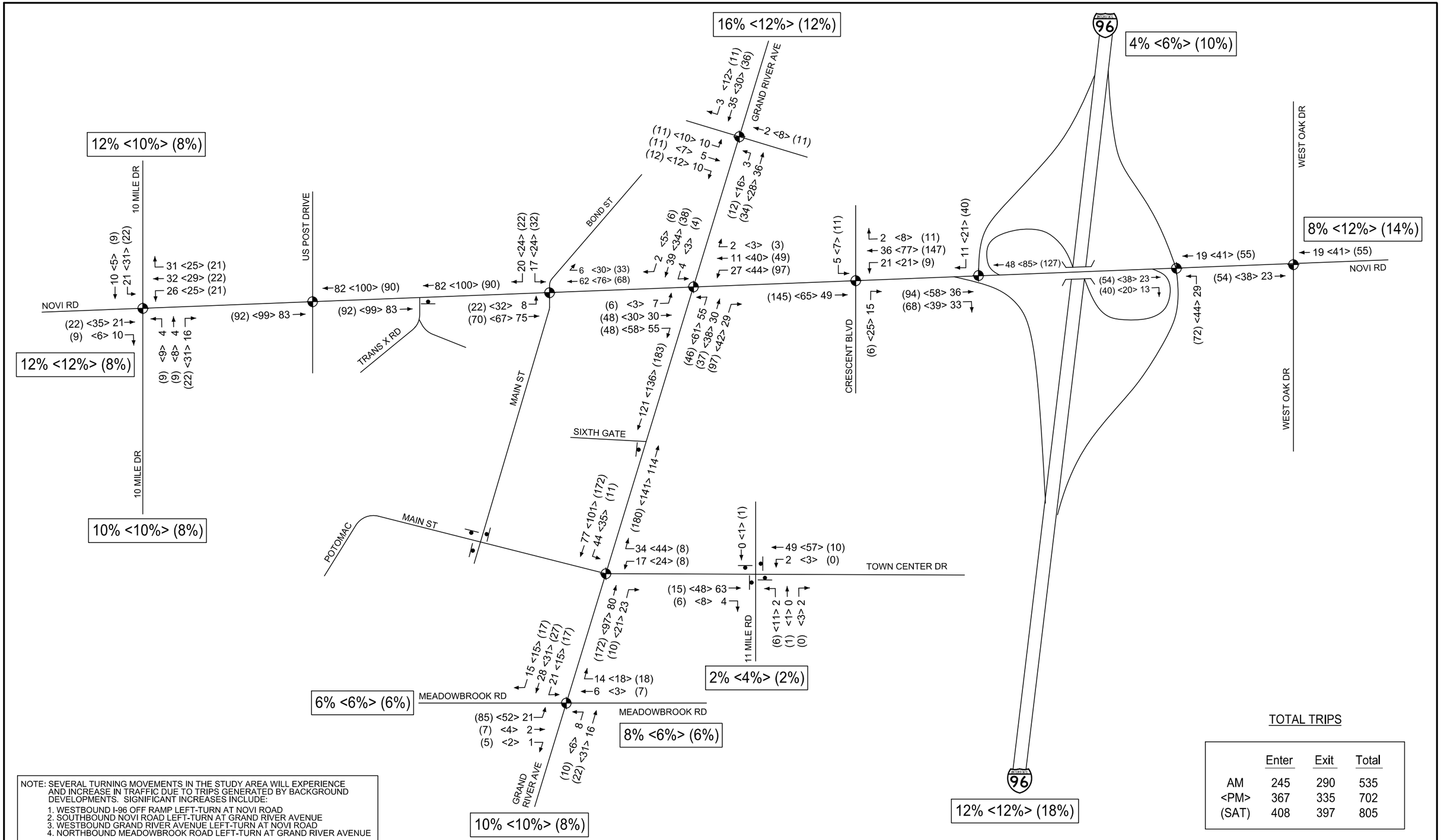
(A-912) <A-1047> A-923
(A-97) <A-50> A-43
(E-54) <E-70> E-22
(D-5) <D-4> D-2
(D-48) <D-33> D-32
LEGEND
- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT
XXX-X - AM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
<XXX-X> - PM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
(XXX-X) - SATURDAY PEAK TRAFFIC VOLUME & LOS
AECOM
NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY
EXISTING (2018) AM, PM AND SATURDAY
PEAK-HOUR VOLUMES AND LEVELS OF SERVICE (W/MITIGATION)
FIGURE
4



NOTE: SEVERAL TURNING MOVEMENTS IN THE STUDY AREA WILL EXPERIENCE AND INCREASE IN TRAFFIC DUE TO TRIPS GENERATED BY BACKGROUND DEVELOPMENTS. SIGNIFICANT INCREASES INCLUDE:

1. WESTBOUND I-96 OFF RAMP LEFT-TURN AT NOVI ROAD
2. SOUTHBOUND NOVI ROAD LEFT-TURN AT GRAND RIVER AVENUE
3. WESTBOUND GRAND RIVER AVENUE LEFT-TURN AT NOVI ROAD
4. NORTHBOUND MEADOWBROOK ROAD LEFT-TURN AT GRAND RIVER AVENUE

TOTAL TRIPS

	Enter	Exit	Total
AM	245	290	535
<PM>	367	335	702
(SAT)	408	397	805

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

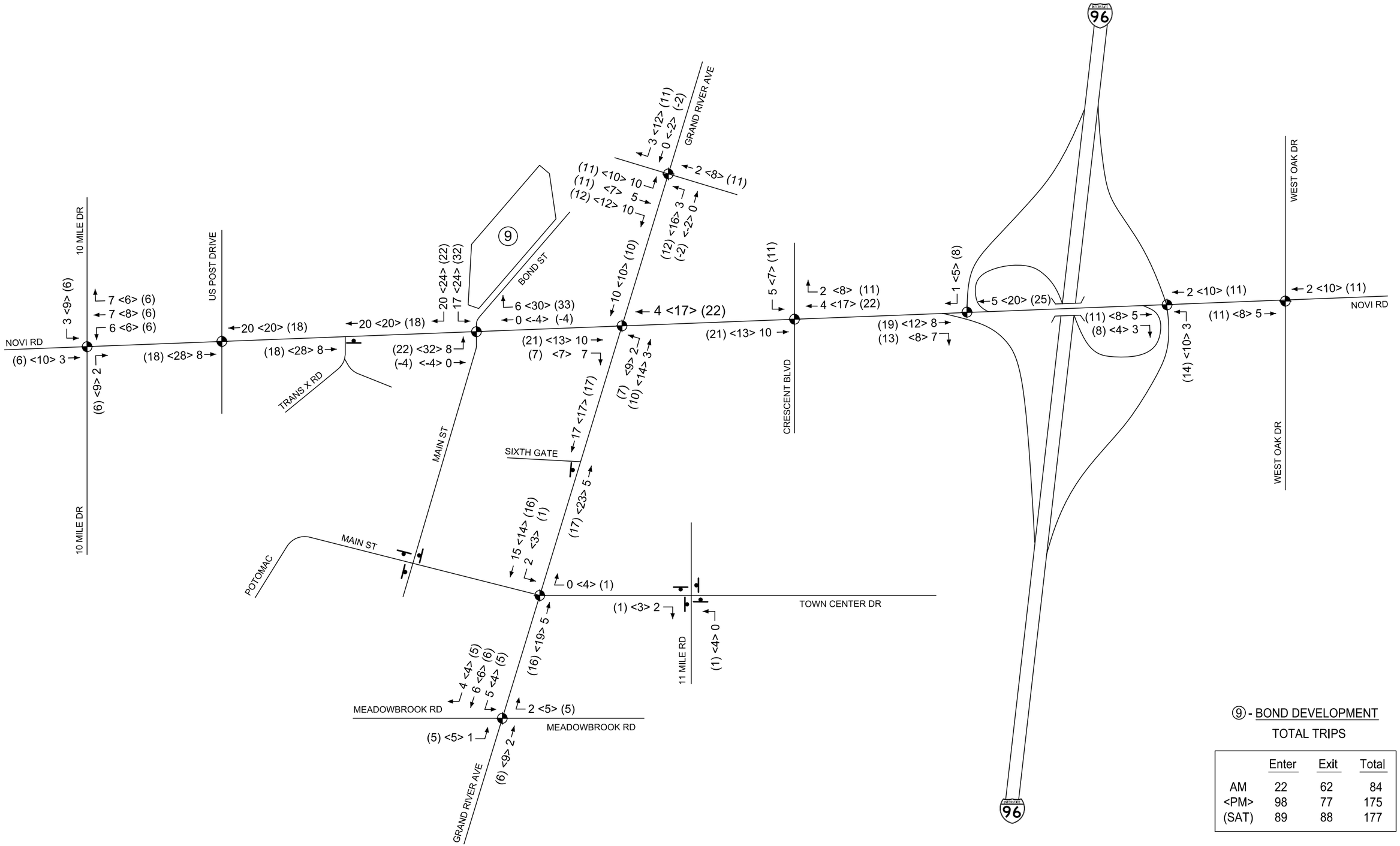
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

2028 BACKGROUND DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

FIGURE 5

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-5_BKGD DEVELOPMENT TOTAL GENERATED VOLUMES



⑨ - BOND DEVELOPMENT

TOTAL TRIPS

	Enter	Exit	Total
AM	22	62	84
<PM>	98	77	175
(SAT)	89	88	177

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME

<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME

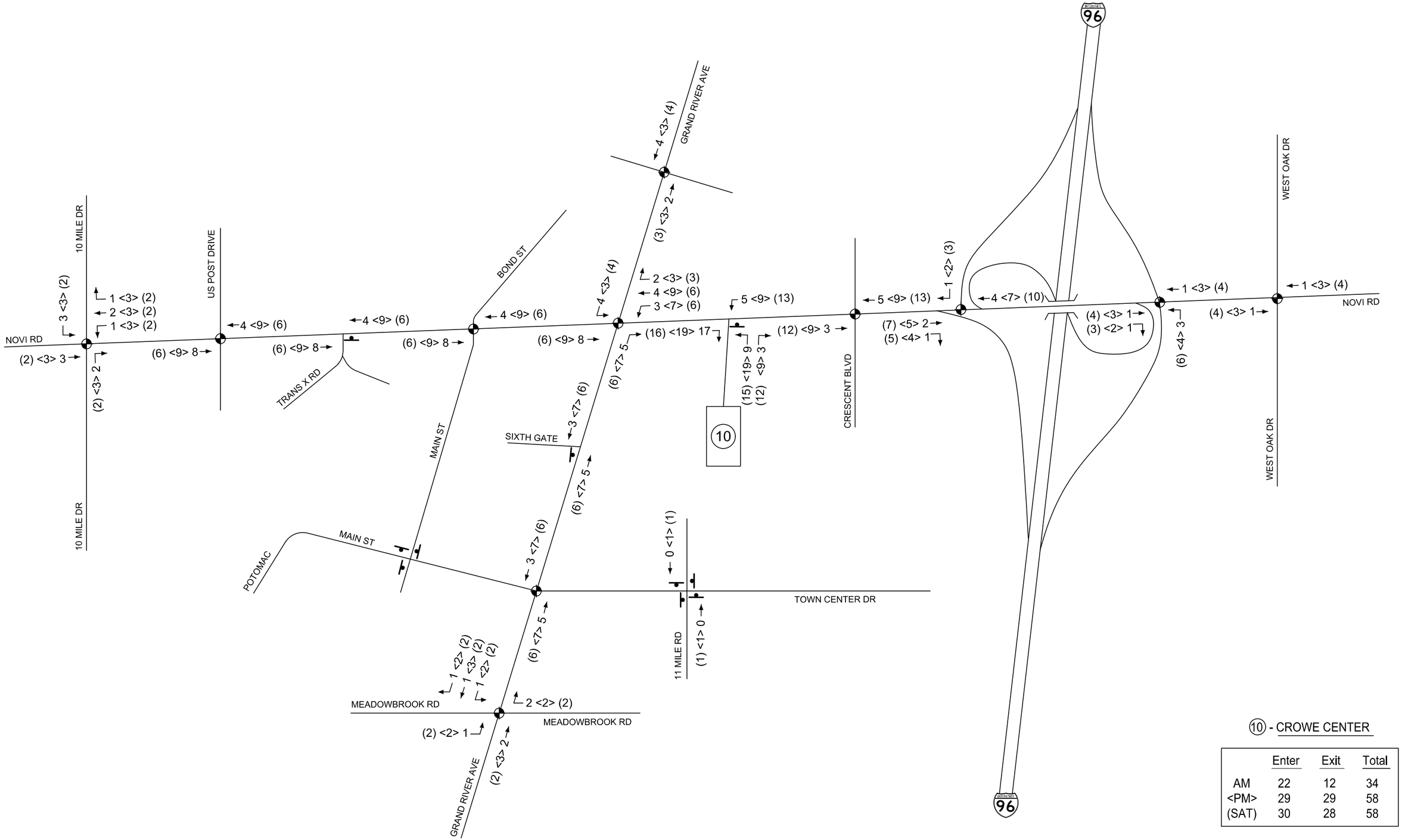
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

BOND DEVELOPMENT GENERATED TRAFFIC VOLUMES

FIGURE 5A



10 - CROWE CENTER

	Enter	Exit	Total
AM	22	12	34
<PM>	29	29	58
(SAT)	30	28	58

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

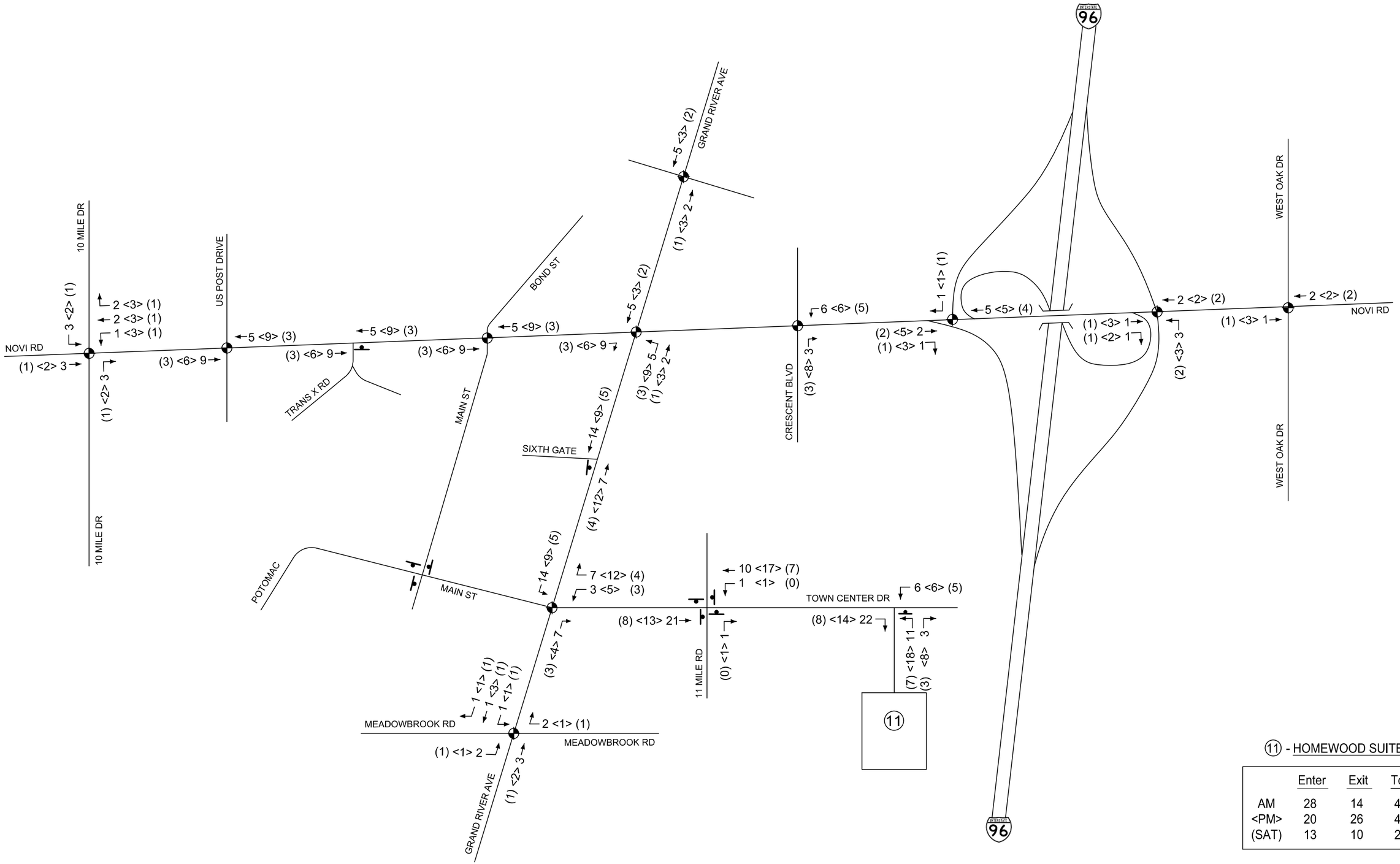
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

CROWE CENTER
GENERATED TRAFFIC VOLUMES

FIGURE 5B



(11) - HOMEWOOD SUITES

	Enter	Exit	Total
AM	28	14	42
<PM>	20	26	46
(SAT)	13	10	23

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

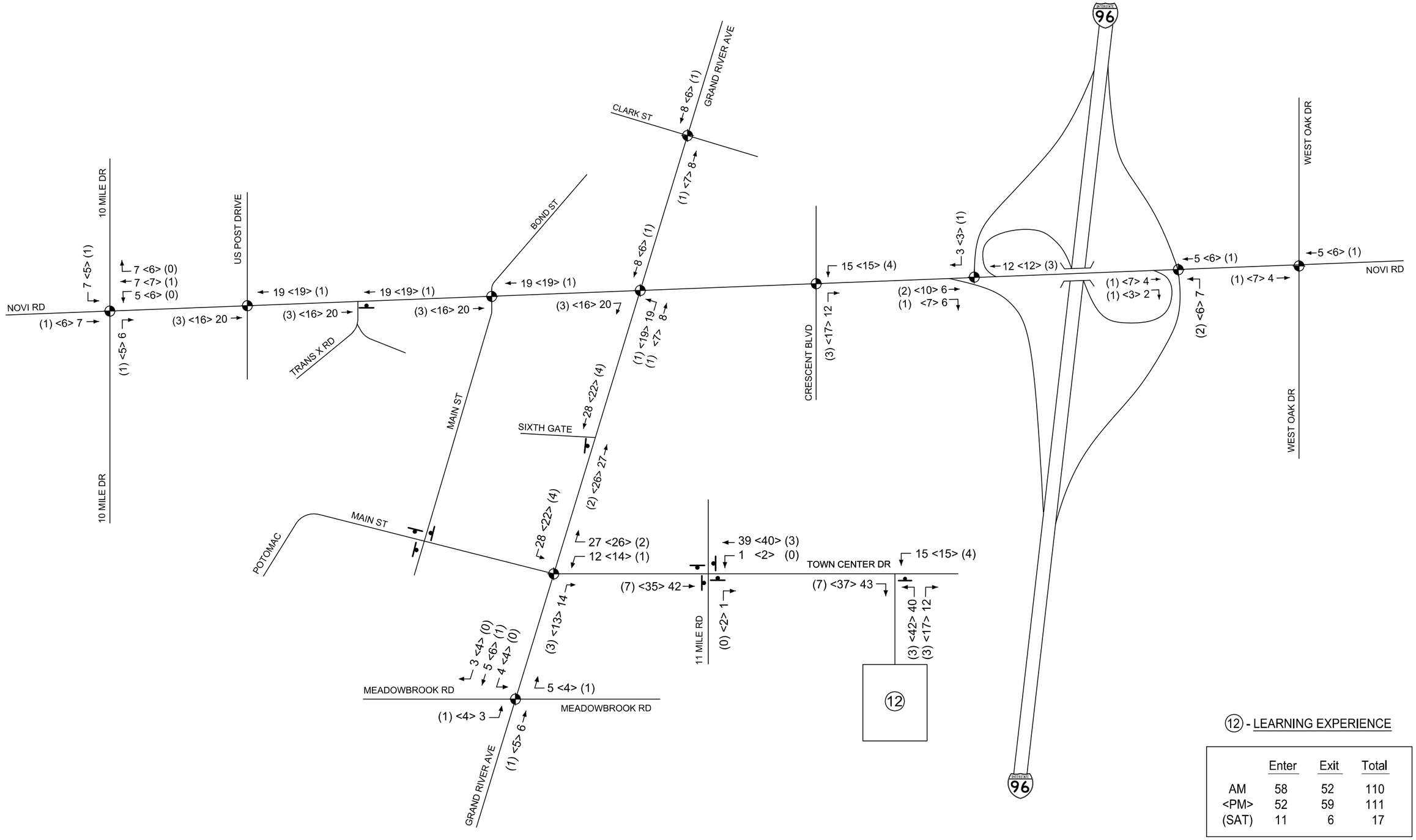
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

HOMEWOOD SUITES
GENERATED TRAFFIC VOLUMES

FIGURE
5C



12 - LEARNING EXPERIENCE

	Enter	Exit	Total
AM	58	52	110
<PM>	52	59	111
(SAT)	11	6	17

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

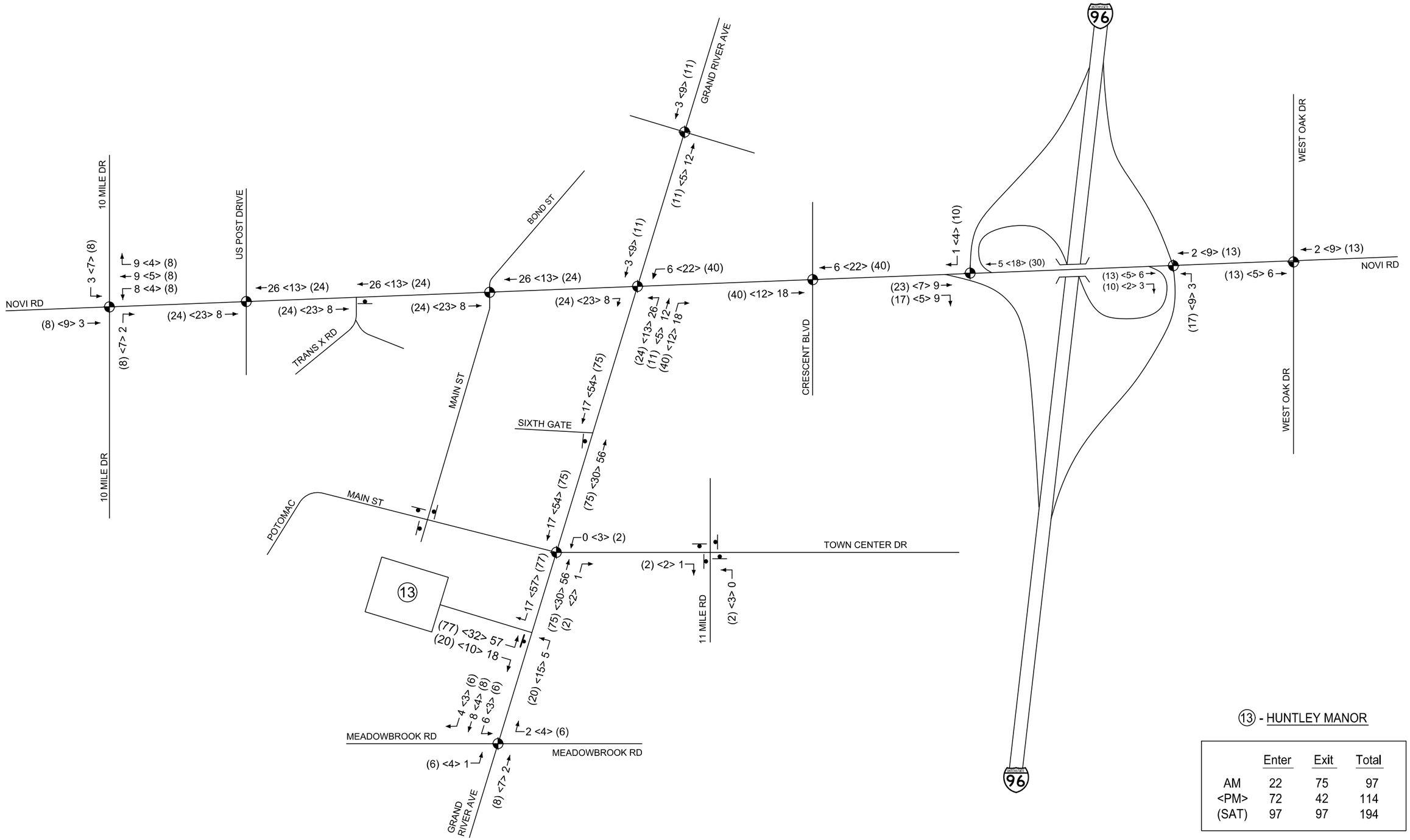
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

LEARNING EXPERIENCE GENERATED TRAFFIC VOLUMES

FIGURE 5D



13 - HUNTLEY MANOR

	Enter	Exit	Total
AM	22	75	97
<PM>	72	42	114
(SAT)	97	97	194

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

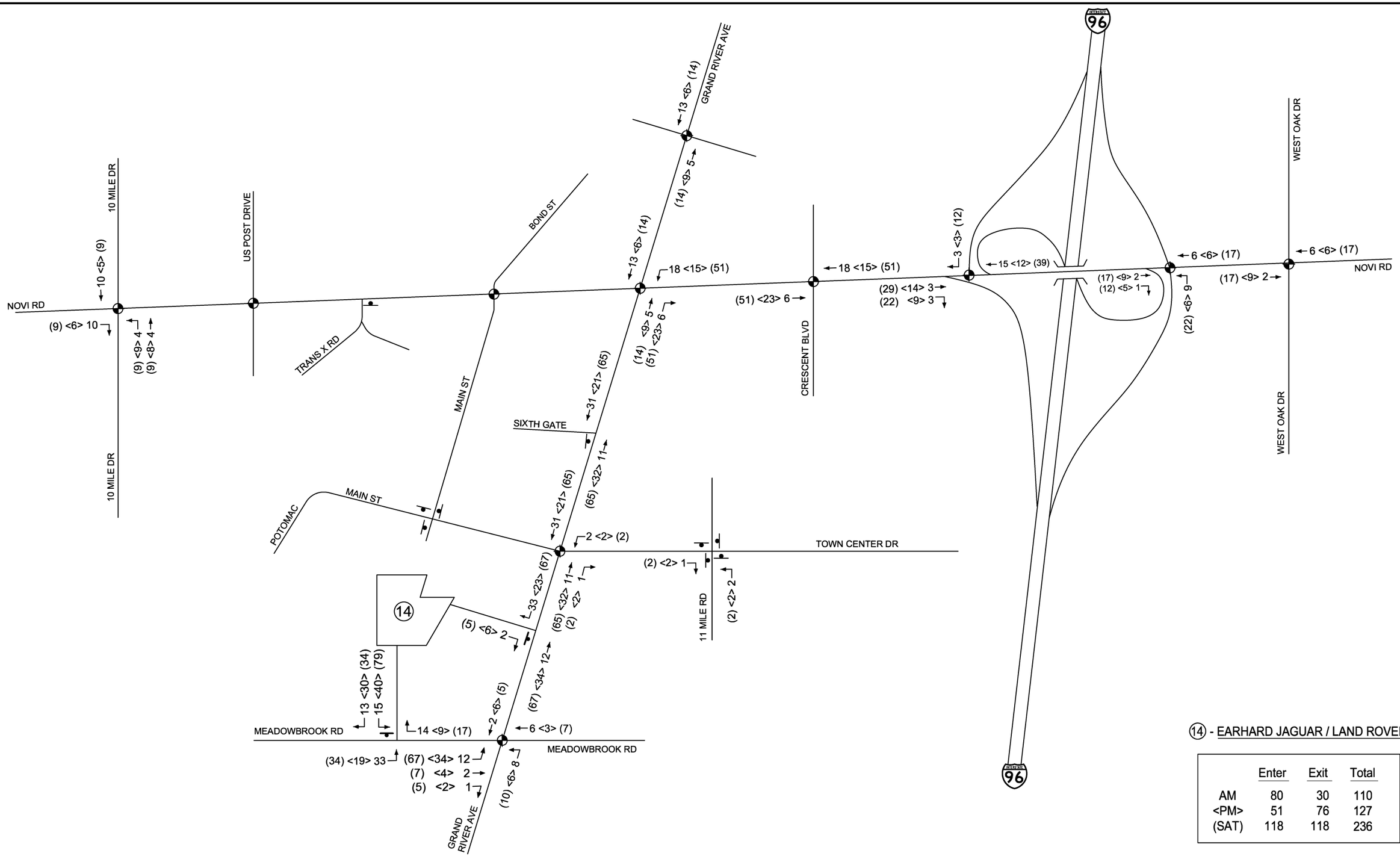
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

HUNTLEY MANOR
GENERATED TRAFFIC VOLUMES

FIGURE 5E



14 - EARHARD JAGUAR / LAND ROVER

	Enter	Exit	Total
AM	80	30	110
<PM>	51	76	127
(SAT)	118	118	236

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

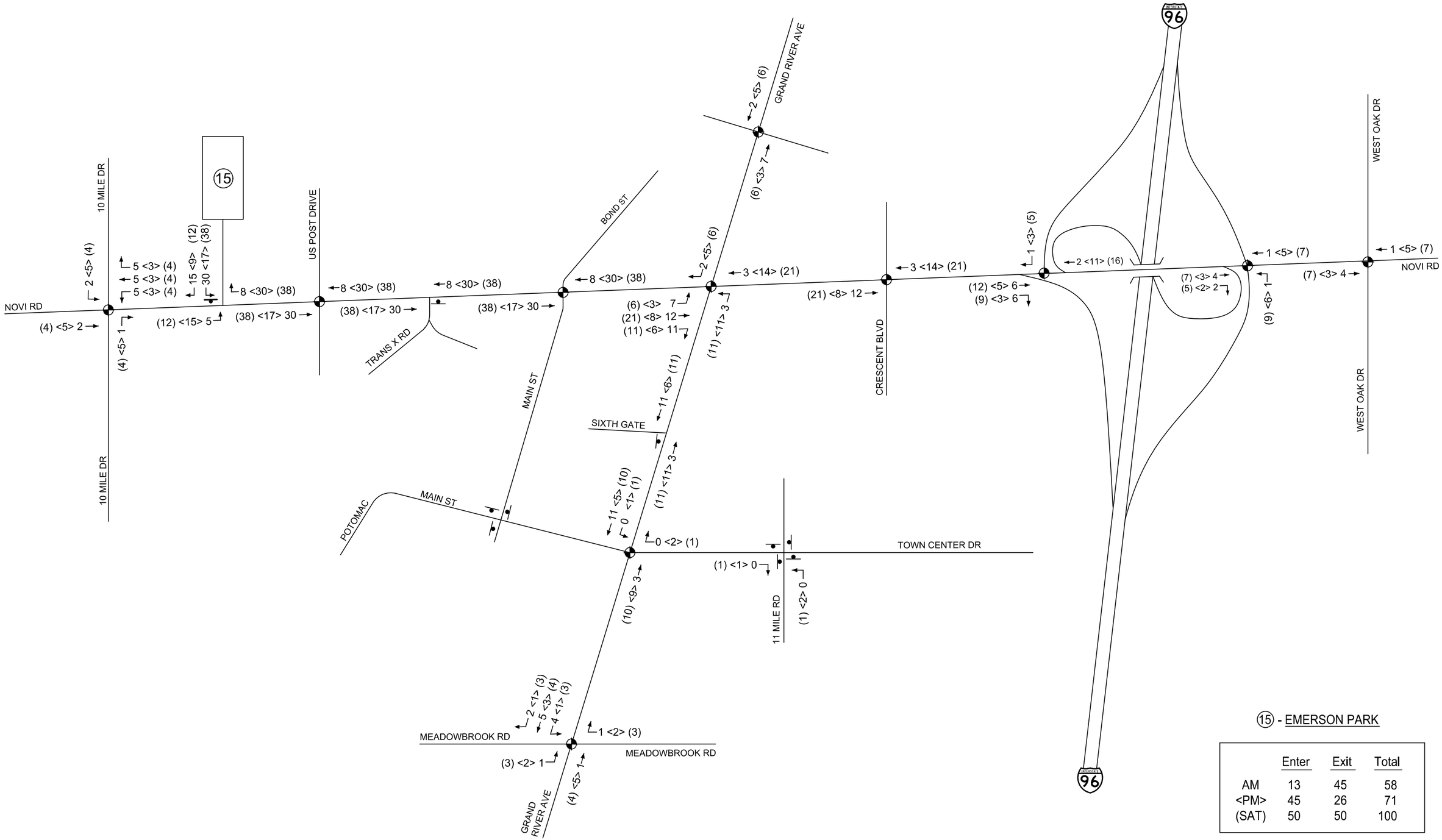
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

ERHARD JAGUAR / LAND ROVER GENERATED TRAFFIC VOLUMES

FIGURE 5F



15 - EMERSON PARK

	Enter	Exit	Total
AM	13	45	58
<PM>	45	26	71
(SAT)	50	50	100

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

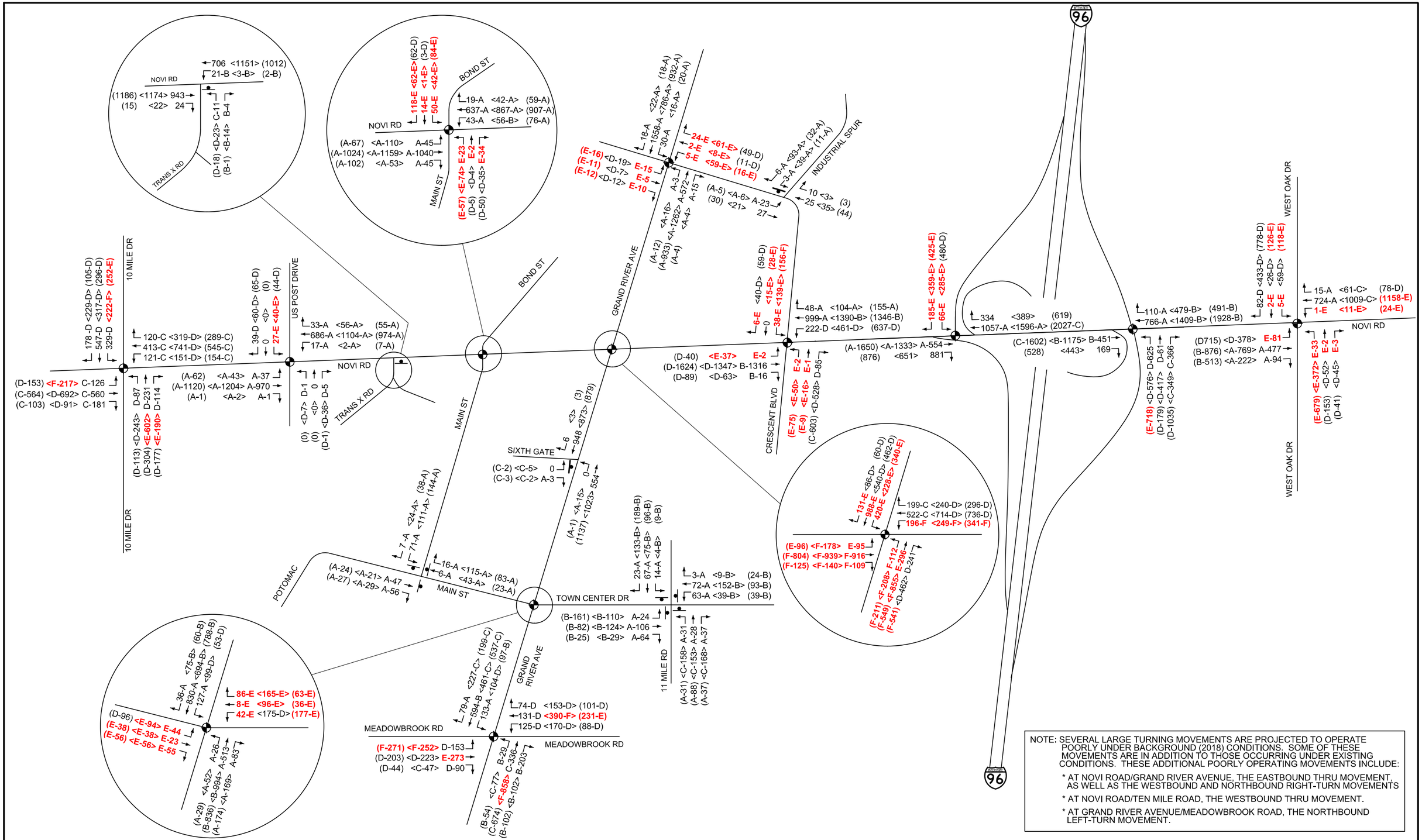
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

EMERSON PARK
GENERATED TRAFFIC VOLUMES

FIGURE 5G



NOTE: SEVERAL LARGE TURNING MOVEMENTS ARE PROJECTED TO OPERATE POORLY UNDER BACKGROUND (2018) CONDITIONS. SOME OF THESE MOVEMENTS ARE IN ADDITION TO THOSE OCCURRING UNDER EXISTING CONDITIONS. THESE ADDITIONAL POORLY OPERATING MOVEMENTS INCLUDE:

* AT NOVI ROAD/GRAND RIVER AVENUE, THE EASTBOUND THRU MOVEMENT, AS WELL AS THE WESTBOUND AND NORTHBOUND RIGHT-TURN MOVEMENTS
* AT NOVI ROAD/TEN MILE ROAD, THE WESTBOUND THRU MOVEMENT.
* AT GRAND RIVER AVENUE/MEADOWBROOK ROAD, THE NORTHBOUND LEFT-TURN MOVEMENT.

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX-X - AM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
<XXX-X> - PM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
(XXX-X) - SATURDAY PEAK TRAFFIC VOLUME & LOS

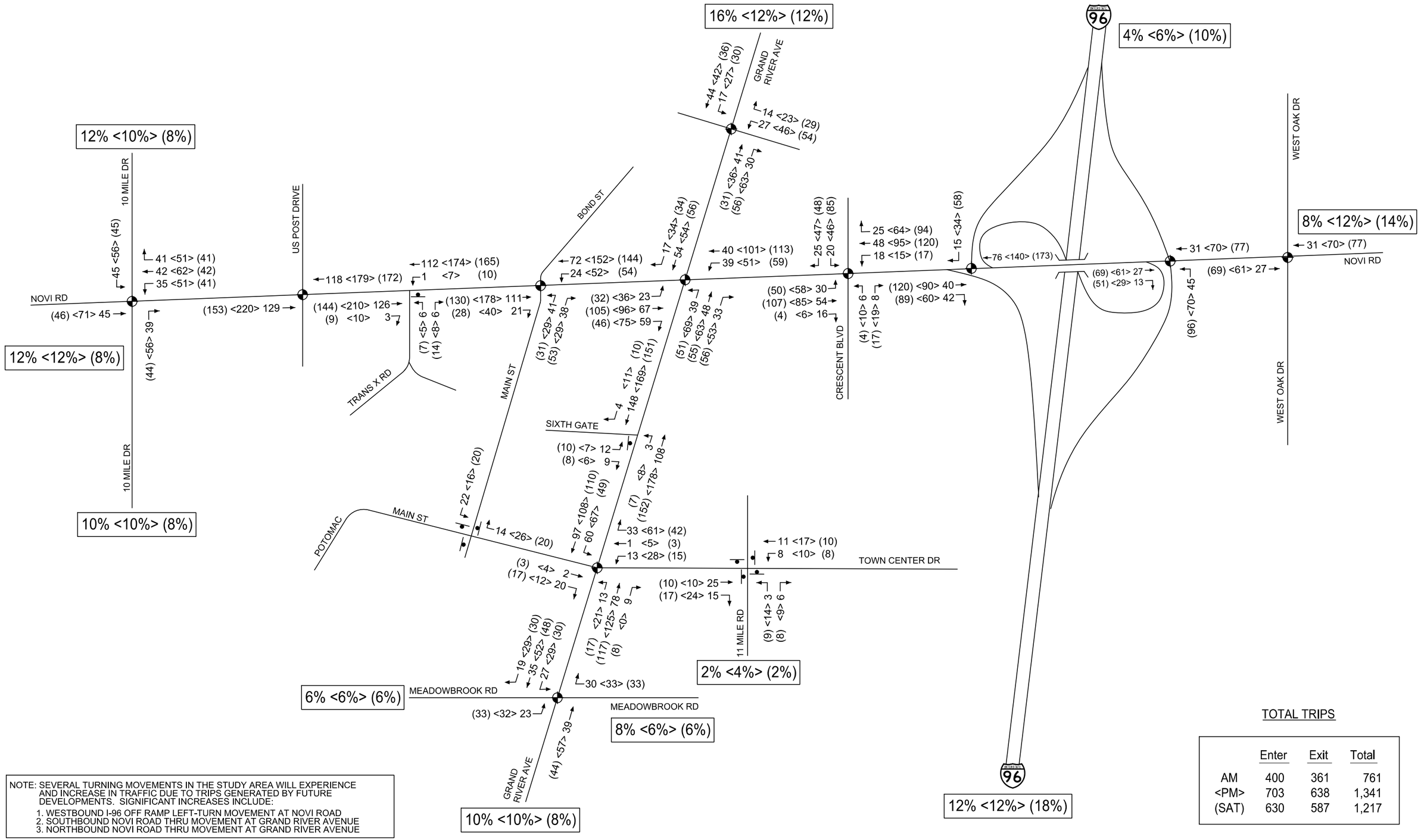
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

BACKGROUND (2028) AM, PM AND SATURDAY PEAK-HOUR VOLUMES AND LEVELS OF SERVICE

FIGURE 6

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-6_BKGD 2028 VOLUMES & LOS



NOTE: SEVERAL TURNING MOVEMENTS IN THE STUDY AREA WILL EXPERIENCE AND INCREASE IN TRAFFIC DUE TO TRIPS GENERATED BY FUTURE DEVELOPMENTS. SIGNIFICANT INCREASES INCLUDE:

1. WESTBOUND I-96 OFF RAMP LEFT-TURN MOVEMENT AT NOVI ROAD
2. SOUTHBOUND NOVI ROAD THRU MOVEMENT AT GRAND RIVER AVENUE
3. NORTHBOUND NOVI ROAD THRU MOVEMENT AT GRAND RIVER AVENUE

TOTAL TRIPS

	Enter	Exit	Total
AM	400	361	761
<PM>	703	638	1,341
(SAT)	630	587	1,217

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

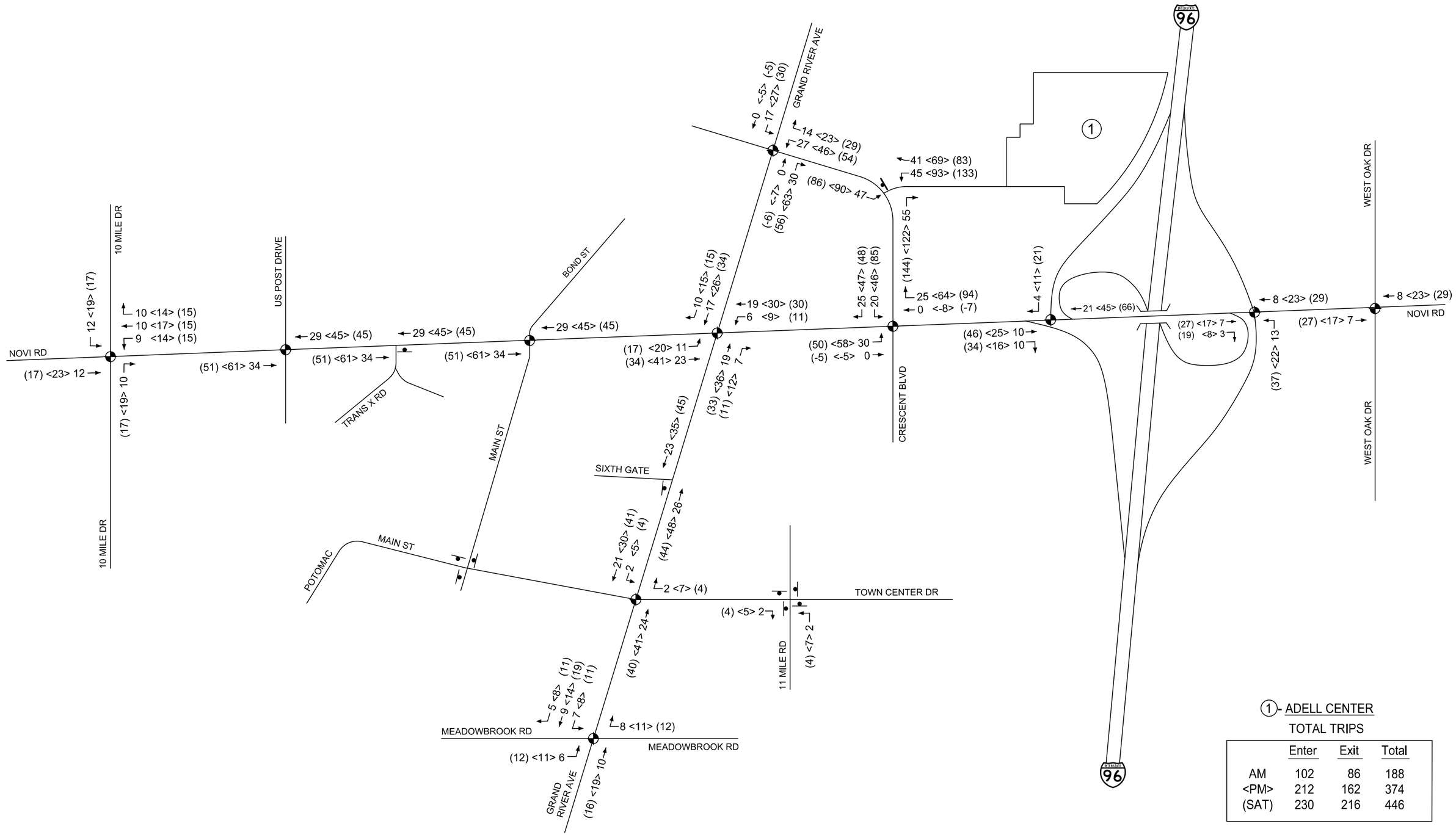
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

2028 FUTURE DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

FIGURE 7

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-7_FUTURE DEVELOPMENT TOTAL GENERATED VOLUMES



1- ADELL CENTER

TOTAL TRIPS

	Enter	Exit	Total
AM	102	86	188
<PM>	212	162	374
(SAT)	230	216	446

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME

<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME

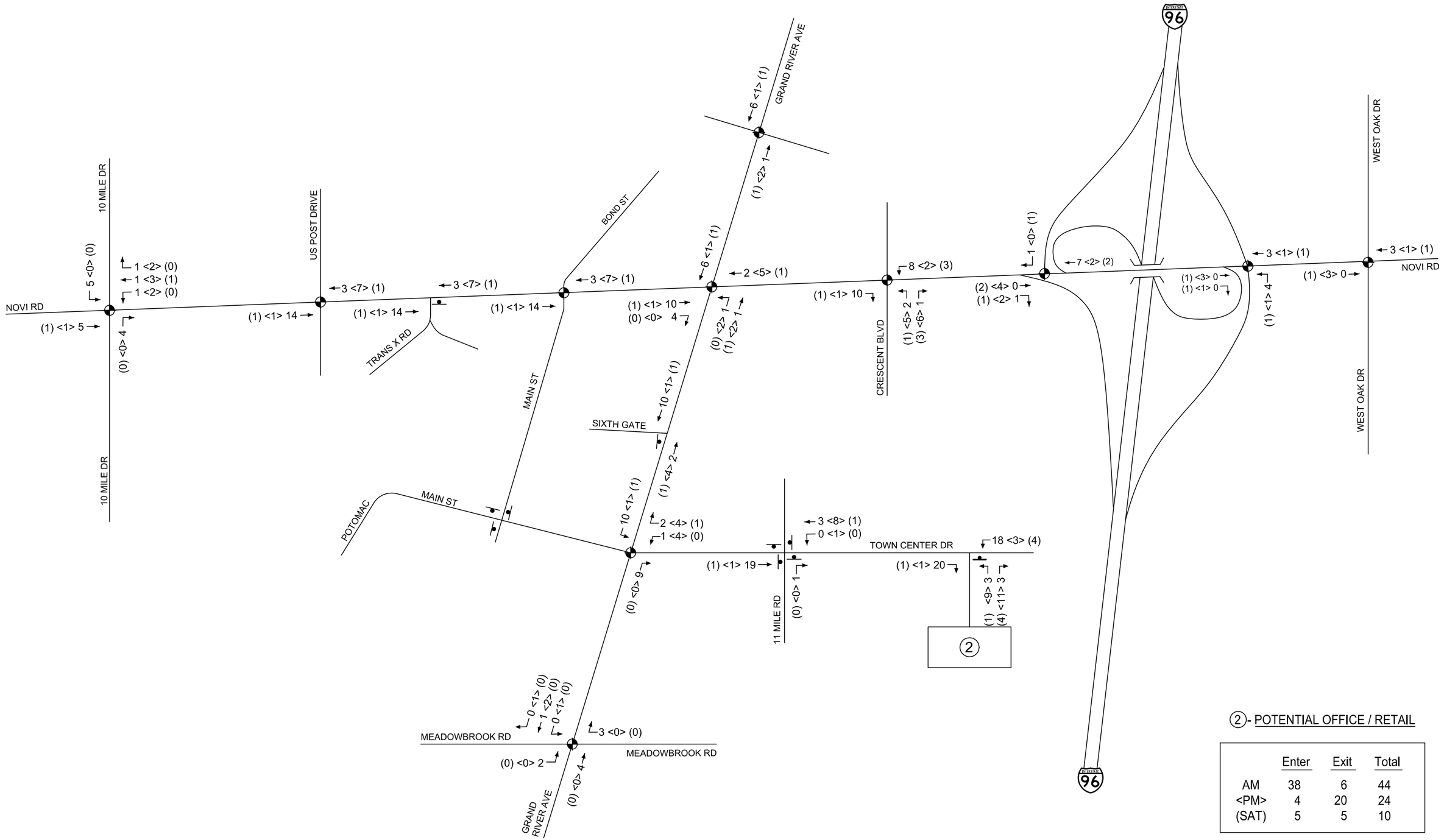
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

ADELL CENTER
GENERATED TRAFFIC VOLUMES

FIGURE 7A



② - POTENTIAL OFFICE / RETAIL

	Enter	Exit	Total
AM	38	6	44
<PM>	4	20	24
(SAT)	5	5	10

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

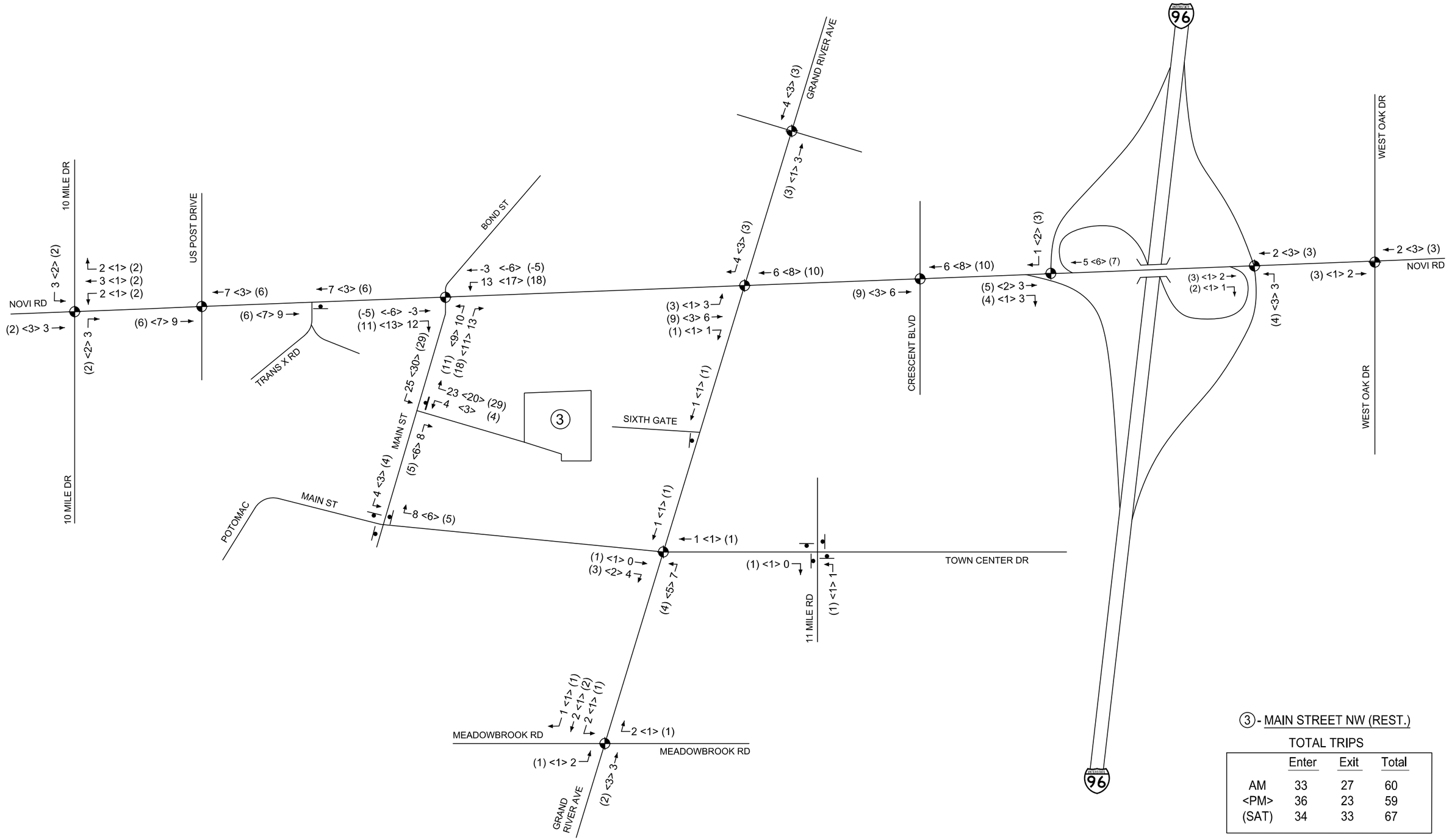
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

POTENTIAL OFFICE / RETAIL GENERATED TRAFFIC VOLUMES

FIGURE 7B



③ - MAIN STREET NW (REST.)

TOTAL TRIPS

	Enter	Exit	Total
AM	33	27	60
<PM>	36	23	59
(SAT)	34	33	67

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

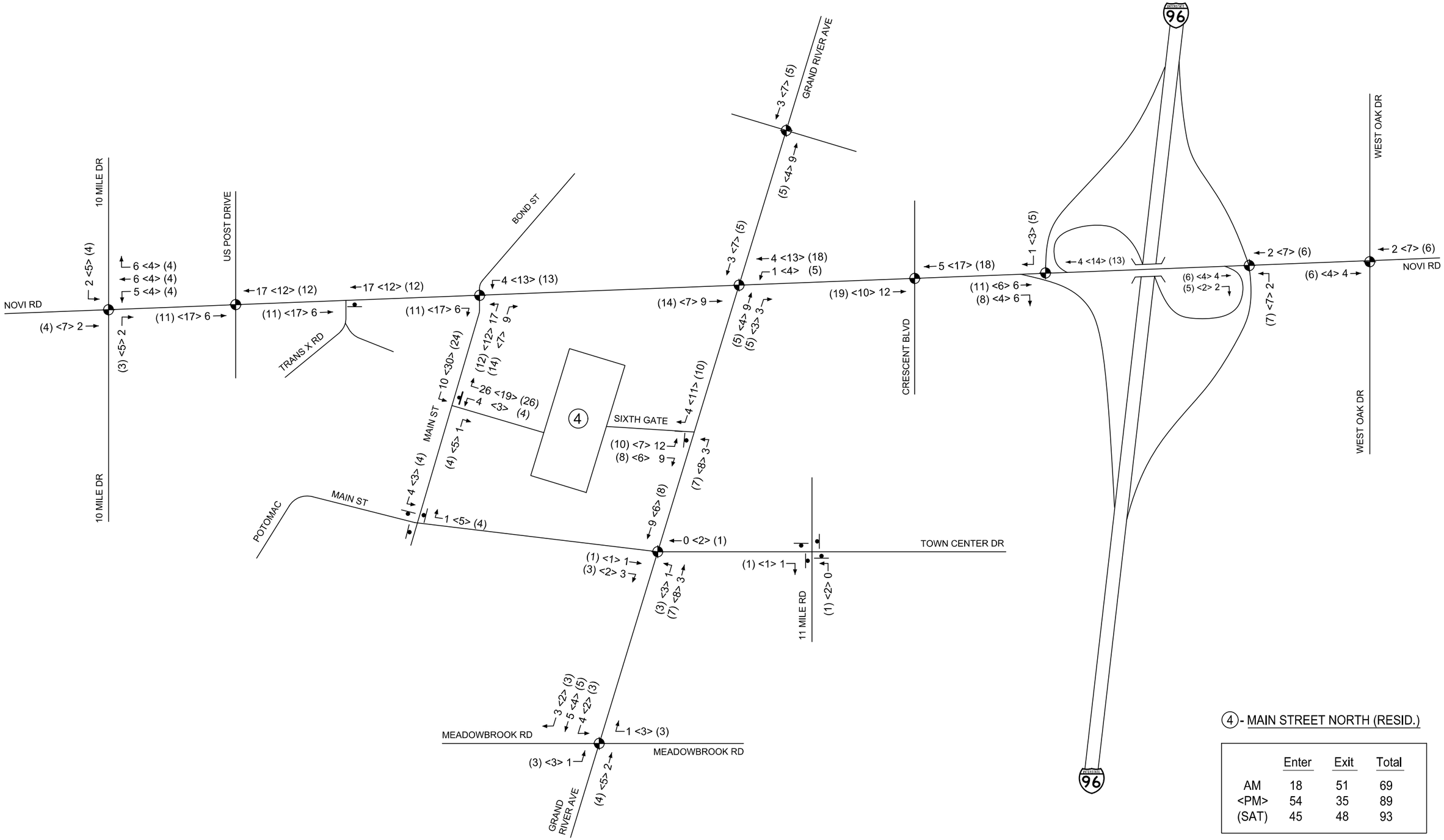
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

MAIN STREET NW (RESTAURANT) GENERATED TRAFFIC VOLUMES

FIGURE 7C

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-7C_MAIN STREET NW RES GENERATED VOLUMES



④- MAIN STREET NORTH (RESID.)

	Enter	Exit	Total
AM	18	51	69
<PM>	54	35	89
(SAT)	45	48	93

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

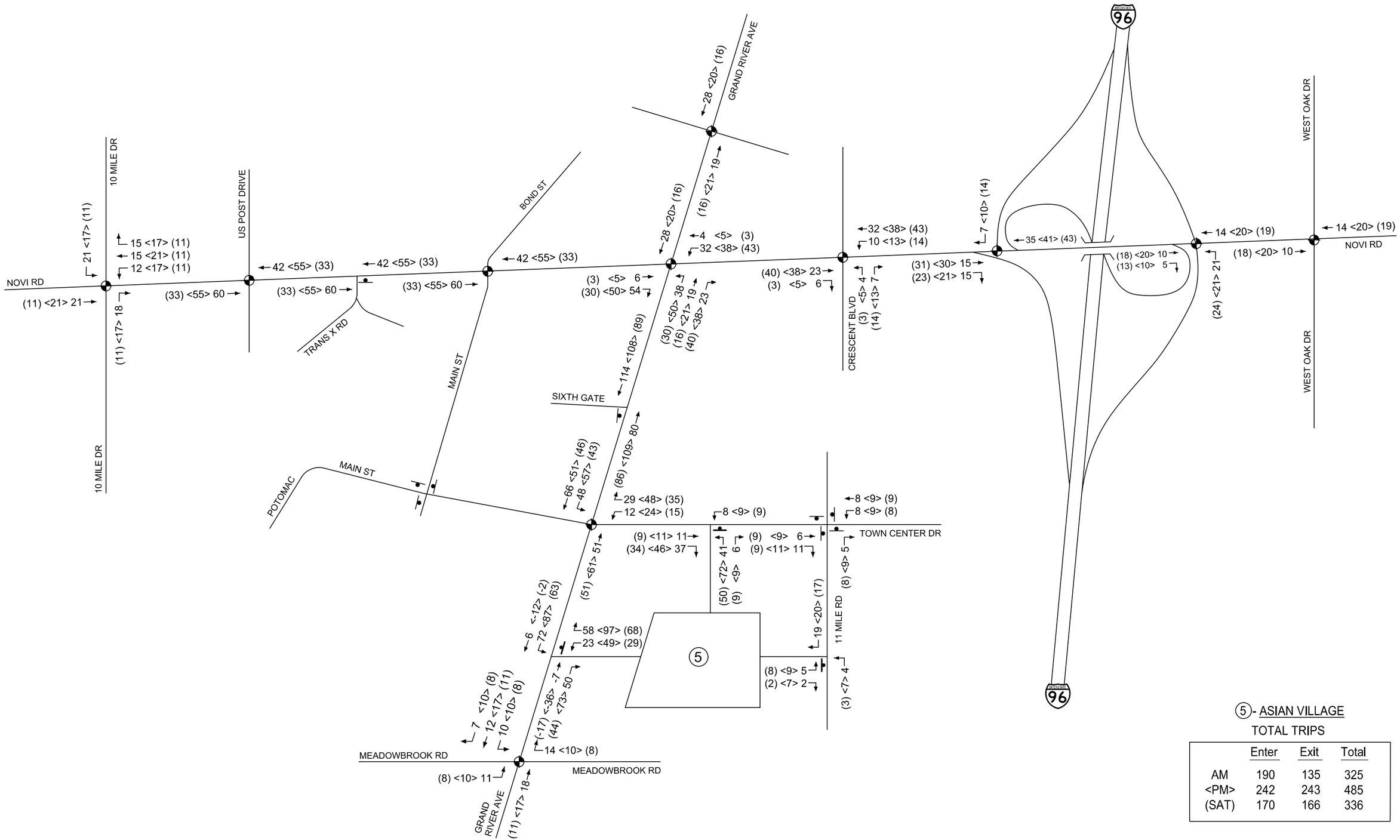
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

MAIN STREET NORTH (RESIDENTIAL) GENERATED TRAFFIC VOLUMES

FIGURE 7D

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-7D_MAIN STREET NORTH RESID GENERATED VOLUMES



5 - ASIAN VILLAGE

TOTAL TRIPS

	Enter	Exit	Total
AM	190	135	325
<PM>	242	243	485
(SAT)	170	166	336

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME

<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME

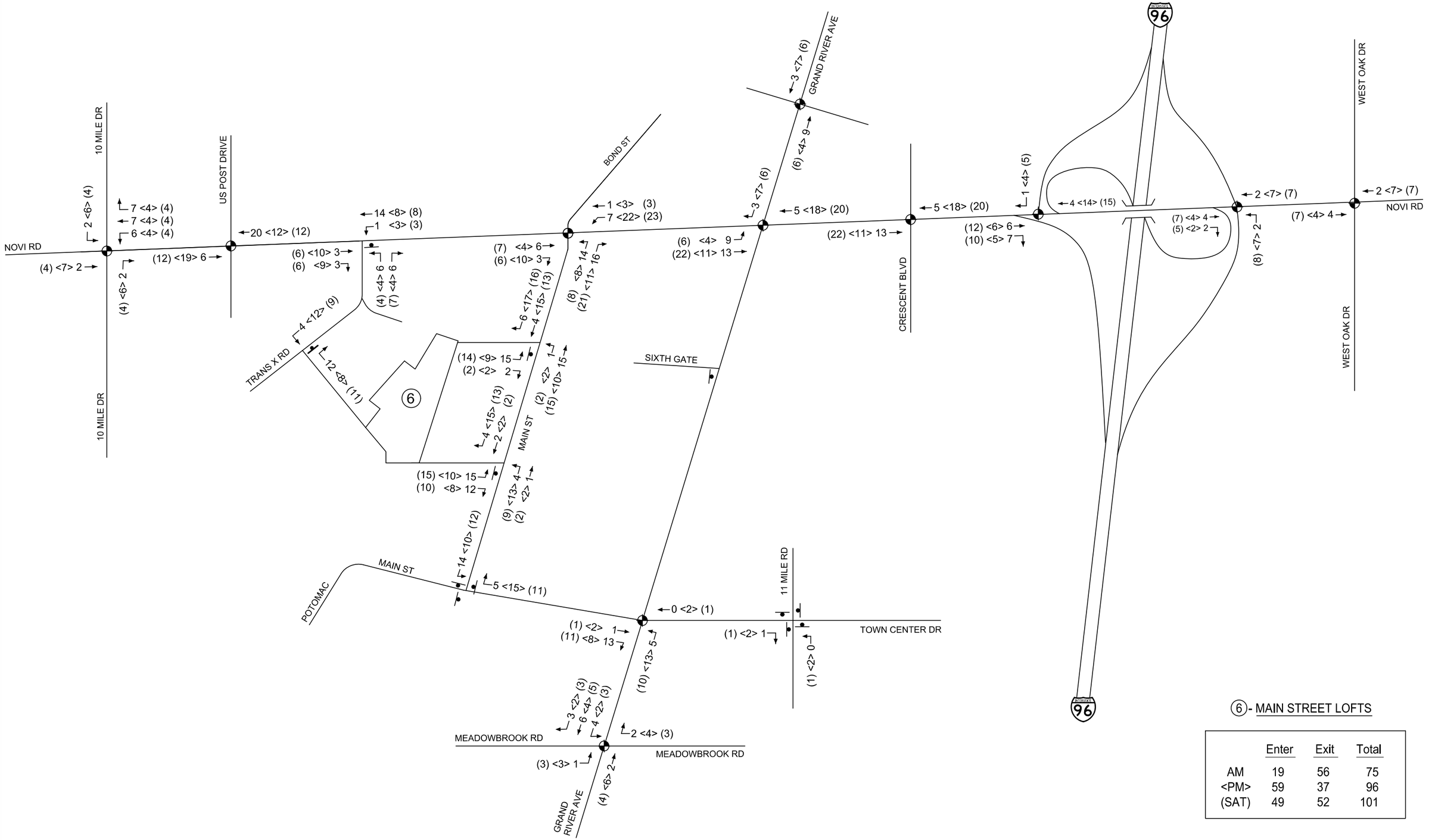
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

ASIAN VILLAGE GENERATED TRAFFIC VOLUMES

FIGURE 7E



⑥- MAIN STREET LOFTS

	Enter	Exit	Total
AM	19	56	75
<PM>	59	37	96
(SAT)	49	52	101

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

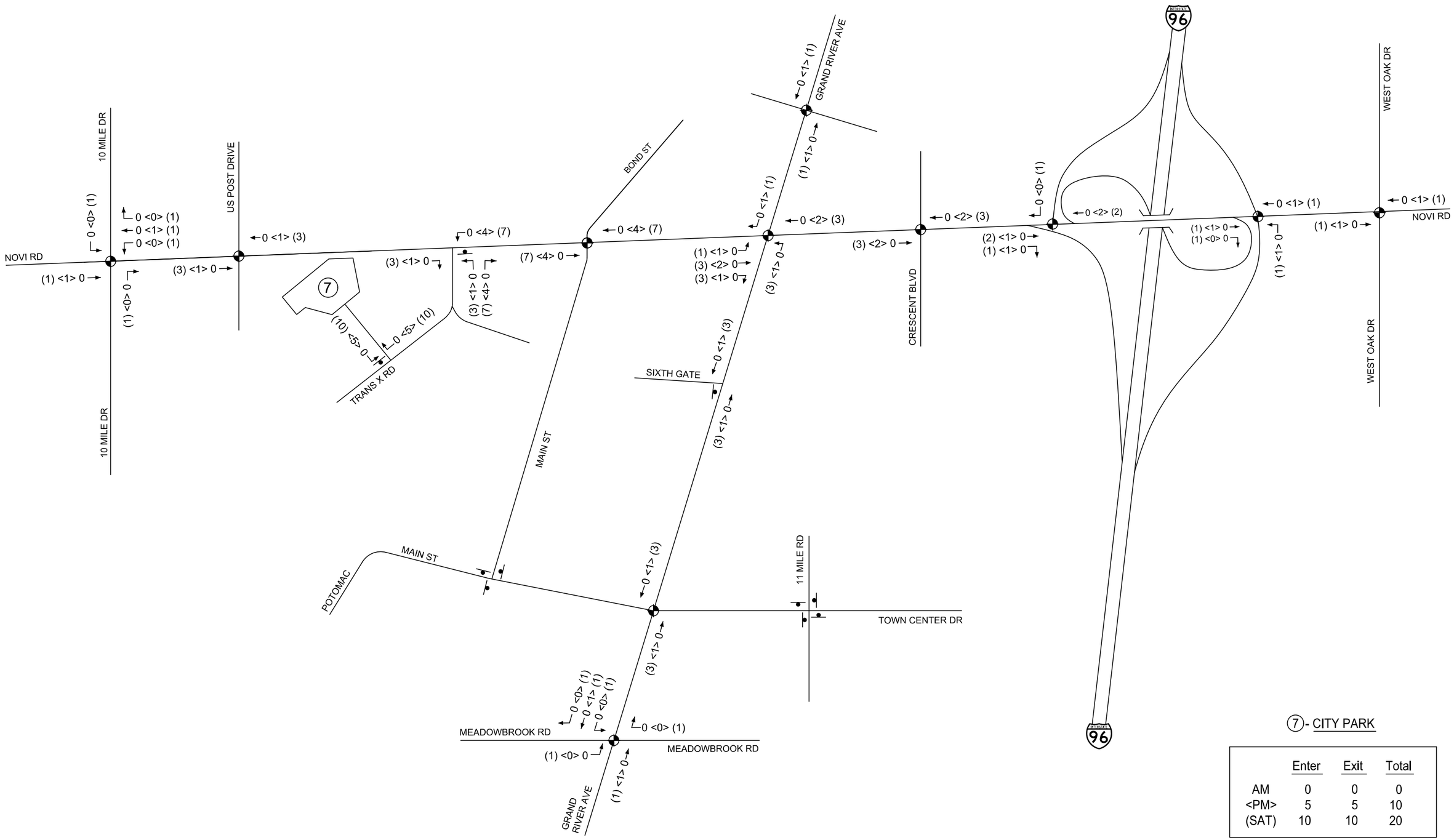
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

MAIN STREET LOFTS
GENERATED TRAFFIC VOLUMES

FIGURE
7F



⑦- CITY PARK

	Enter	Exit	Total
AM	0	0	0
<PM>	5	5	10
(SAT)	10	10	20

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

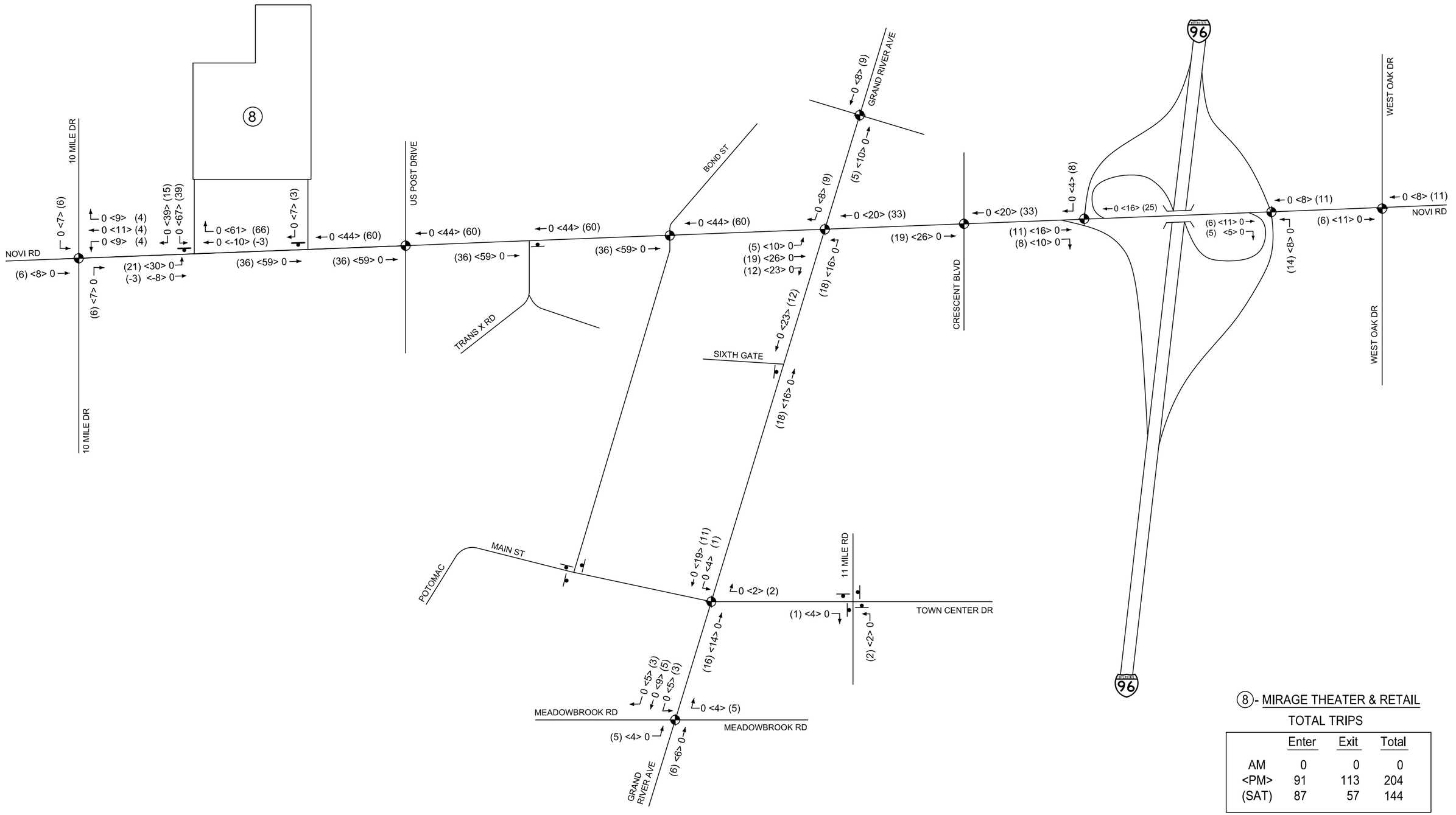
XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME
<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

CITY PARK
GENERATED TRAFFIC VOLUMES

FIGURE 7G



⑧- MIRAGE THEATER & RETAIL

TOTAL TRIPS

	Enter	Exit	Total
AM	0	0	0
<PM>	91	113	204
(SAT)	87	57	144

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX - AM-PEAK WEEKDAY TRAFFIC VOLUME

<XXX> - PM-PEAK WEEKDAY TRAFFIC VOLUME

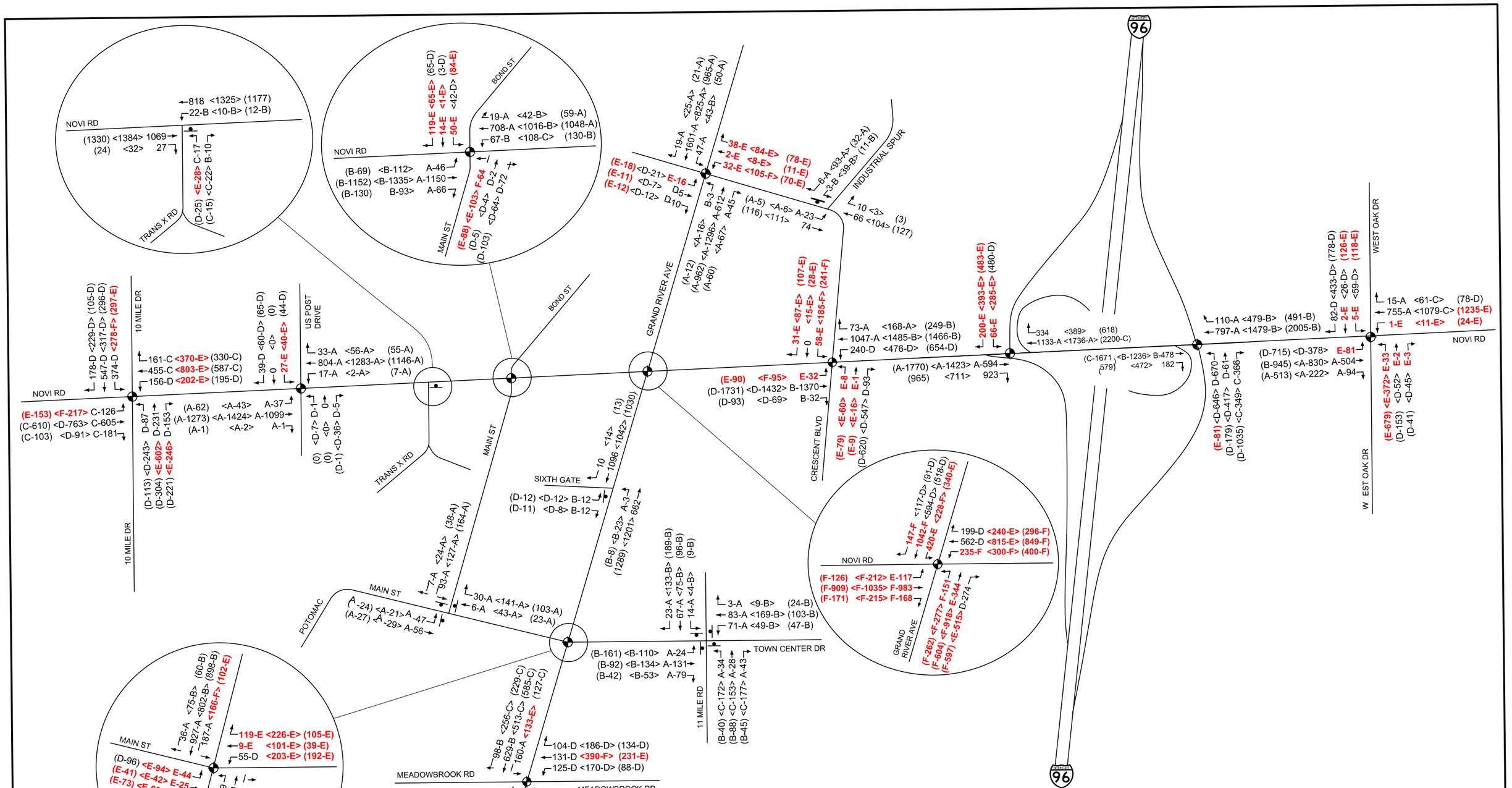
(XXX) - SATURDAY PEAK TRAFFIC VOLUME

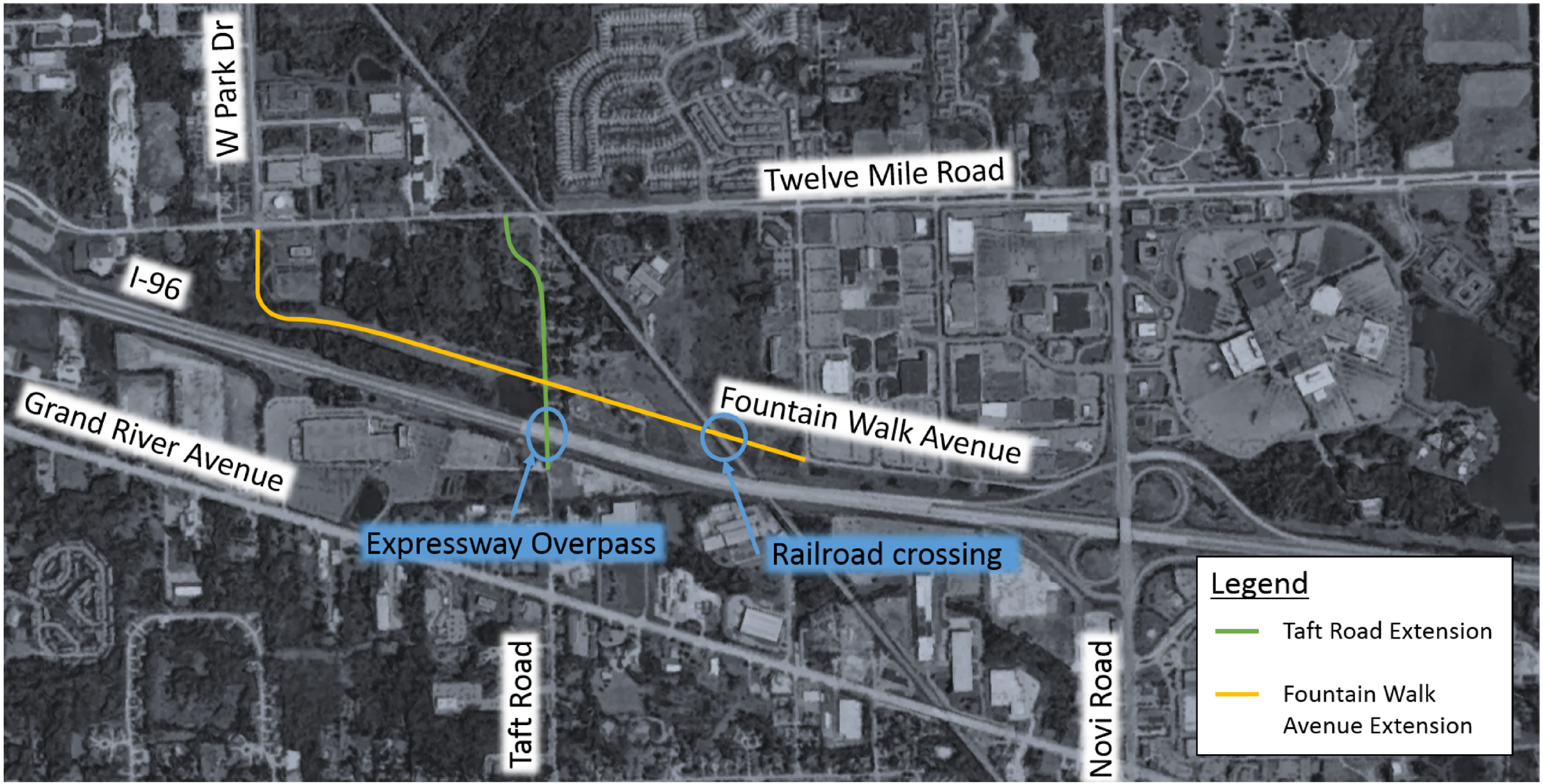
AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

MIRAGE THEATER & RETAIL GENERATED TRAFFIC VOLUMES

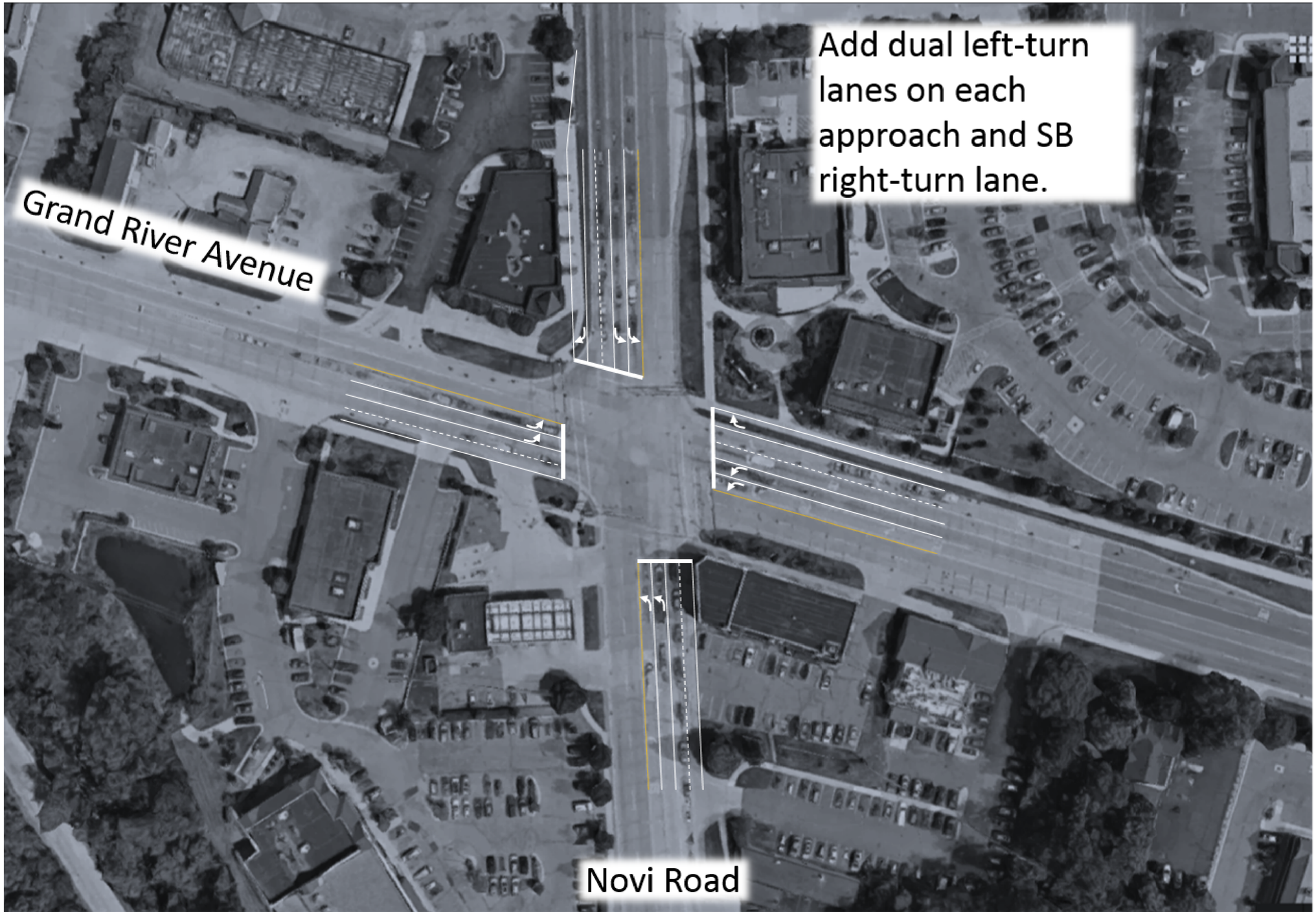
FIGURE 7H


NOVI RD
(1330) <1384> 1069
(24) <32> 27
818 <1325> (1177)
22-B <10-B> (12-B)
TRANS X RD
(D-25) <E-28> C-17
(C-15) <C-22> B-10
BOND ST
119-E <65-E> (65-D)
14-E <1-E> (3-D)
50-E <42-D> (84-E)
19-A <42-B> (59-A)
708-A <1016-B> (1048-A)
67-B <108-C> (130-B)
(B-69) <B-112> A-46
(B-1152) <B-1335> A-1150
(B-130) B-93> A-66
MAIN ST
(E-88) <E-103> F-64
(D-5) <D-4> D-2
(D-103) <D-64> D-72
19-A <25-A> (21-A)
1601-A <825-A> (965-A)
47-A <43-B> (50-A)
38-E <84-E> (78-E)
2-E <8-E> (11-E)
32-E <105-F> (70-E)
6-A <93-A> (32-A)
3-B <39-B> (11-B)
INDUSTRIAL SPUR
10 <3> (3)
66 <104> (127)
(E-18) <D-21> E-16
(E-11) <D-7> D5
(E-12) <D-12> D10
B-3 A-612
A-16> <A-1296> A-45
A-67> <A-60>
(A-12) (A-962)
(A-5) <A-6> A-23
(116) <111> 74
GRAND RIVER AVE
31-E <87-E> (107-E)
15-E (28-E)
0 58-E <185-F> (241-F)
200-E <393-E> (483-E)
66-E <285-E> (480-D)
73-A <168-A> (249-B)
1047-A <1485-B> (1466-B)
240-D <476-D> (654-D)
334 <389> (618)
1133-A <1736-A> (2200-C)
110-A <479-B> (491-B)
797-A <1479-B> (2005-B)
82-D <433-D> (778-D)
2-E <26-D> (126-E)
5-E <59-D> (118-E)
15-A <61-C> (78-D)
755-A <1079-C> (1235-E)
1-E <11-E> (24-E)
WEST OAK DR
NOVI RD
178-D <229-D> (105-D)
547-D <317-D> (296-D)
374-D <278-F> (297-E)
10 MILE DR
161-C <370-E> (330-C)
455-C <803-E> (587-C)
156-D <202-E> (195-D)
39-D <60-D> (65-D)
0 <0> (0)
27-E <40-E> (44-D)
US POST DRIVE
33-A <56-A> (55-A)
804-A <1283-A> (1146-A)
17-A <2-A> (7-A)
BOND ST
(E-153) <F-217> C-126
(C-610) <D-763> C-605
(C-103) <D-91> C-181
(D-113) <D-243> D-87
(D-304) <E-602> D-231
(D-221) <E-246> D-153
(A-62) <A-43> A-37
(A-1273) <A-1424> A-1099
(A-1) <A-2> A-1
(0) <D-7> D-1
(0) <0> 0
(D-1) <D-36> D-5
TRANS X RD
MAIN ST
10 <14> (13)
1096 <1042> (1030)
SIXTH GATE
(D-12) <D-12> B-12
(D-11) <D-8> B-12
(B-8) <B-23> A-3
(1289) <1201> 662
(38-A)
<24-A> (164-A)
<127-A>
7-A 93-A
30-A <141-A> (103-A)
6-A <43-A> (23-A)
POTOMAC
MAIN ST
A-24) <A-21> A-47
(A-27) <A-29> A-56
(E-90) <F-95> E-32
(D-1731) <D-1432> B-1370
(D-93) <D-69> B-32
(E-79) <E-60> E-8
(E-9) <E-16> E-1
(D-620) <D-547> D-93
CRESCENT BLVD
(A-1770) <A-1423> A-594
(965) <711> 923
(C-1671 579) <B-1236> B-478 <472> 182
(E-81) <D-646> D-670
(D-179) <D-417> D-61
(D-1035) <C-349> C-366
(D-715) <D-378> E-81
(B-945) <A-830> A-504
(A-513) <A-222> A-94
(E-679) <E-372> E-33
(D-153) <D-52> E-2
(D-41) <D-45> E-3
W EST OAK DR
147-F <117-D> (91-D)
1042-F <594-D> (518-D)
420-E <228-F> (340-E)
199-D <240-E> (296-F)
562-D <815-E> (849-F)
235-F <300-F> (400-F)
NOVI RD
(F-126) <F-212> E-117
(F-909) <F-1035> F-983
(F-171) <F-215> F-168
(F-262) <F-277> F-151
(F-804) <F-918> E-344
(F-597) <E-515> D-274
GRAND RIVER AVE
(B-161) <B-110> A-24
(B-92) <B-134> A-131
(B-42) <B-53> A-79
TOWN CENTER DR
23-A <133-B> (189-B)
67-A <75-B> (96-B)
14-A <4-B> (9-B)
3-A <9-B> (24-B)
83-A <169-B> (103-B)
71-A <49-B> (47-B)
11 MILE RD
(B-40) <C-172> A-34
(B-88) <C-153> A-28
(B-45) <C-177> A-43
MEADOWBROOK RD
104-D <186-D> (134-D)
131-D <390-F> (231-E)
125-D <170-D> (88-D)
98-B <256-C> (229-C)
629-B <513-C> (685-C)
160-A <133-E> (127-C)
(F-304) <F-284> D-176
(D-203) <D-223> E-273
(D-44) <C-47> D-90
MEADOWBROOK RD
(B-54) <C-77> B-29
(D-718) <F-915> C-375
(B-102) <B-102> B-203
GRAND RIVER AVE
MAIN ST
36-A <75-B> (60-B)
927-A <802-B> (898-B)
187-A <166-F> (102-E)
119-E <226-E> (105-E)
9-E <101-E> (39-E)
55-D <203-E> (192-E)
(D-96) <E-94> E-44
(E-41) <E-42> E-25
(E-73) <E-68> E-75
(A-46) <A-73> A-39
(C-953) <C-1119> B-591
(A-174) <A-169> A-92
GRAND RIVER AVE
10 MILE DR
NOTE: SEVERAL LARGE TURNING MOVEMENTS ARE PROJECTED TO OPERATE POORLY UNDER FUTURE (2028) CONDITIONS. SOME OF THESE MOVEMENTS ARE IN ADDITION TO THOSE OCCURRING UNDER EXISTING AND BACKGROUND CONDITIONS. THESE ADDITIONAL POORLY OPERATING MOVEMENTS INCLUDE:
*AT NOVI ROAD/CRESCENT BOULEVARD, THE EASTBOUND LEFT-TURN MOVEMENT
*AT NOVI ROAD/GRAND RIVER AVENUE, THE SHOUTHBOUND THRU AND RIGHT-TURN MOVEMENTS
*AT NOVI ROAD/TEN MILE ROAD, THE SOUTHBOUND THRU AND RIGHT-TURN MOVEMENTS
LEGEND
- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT
XXX-X - AM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
<XXX-X> - PM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
(XXX-X) - SATURDAY PEAK TRAFFIC VOLUME & LOS
AECOM
NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY
FUTURE (2028) AM, PM AND SATURDAY
PEAK-HOUR VOLUMES AND LEVELS OF SERVICE
FIGURE
8
G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-8_FUTURE 2028 VOLUMES & LOS



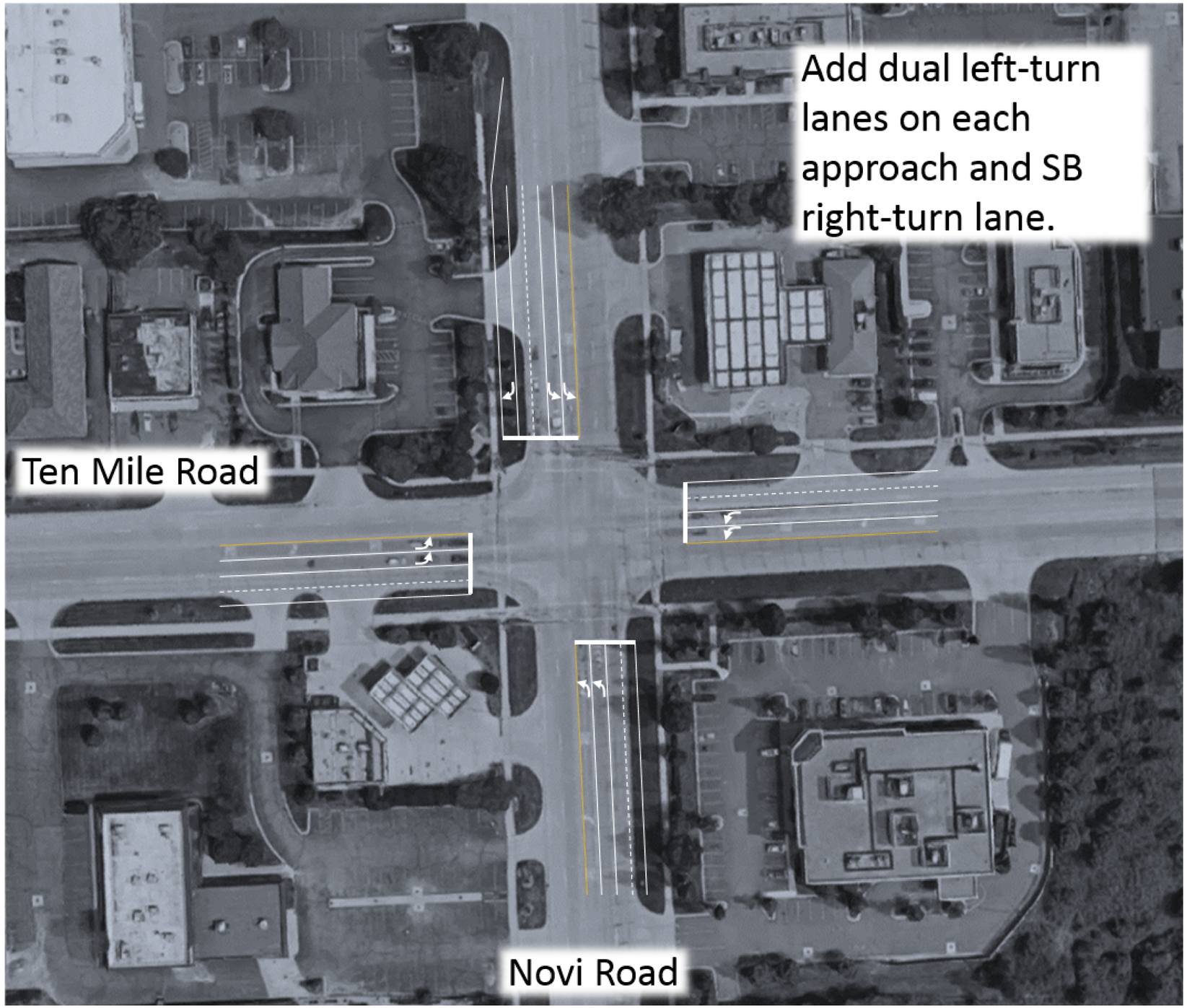
	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM		TAFT ROAD/FOUNTAIN WALK AVENUE CONNECTION CONCEPT	FIGURE 9

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-9_TAFT ROAD FOUNTAIN WALK AVE CONNECTION CONCEPT



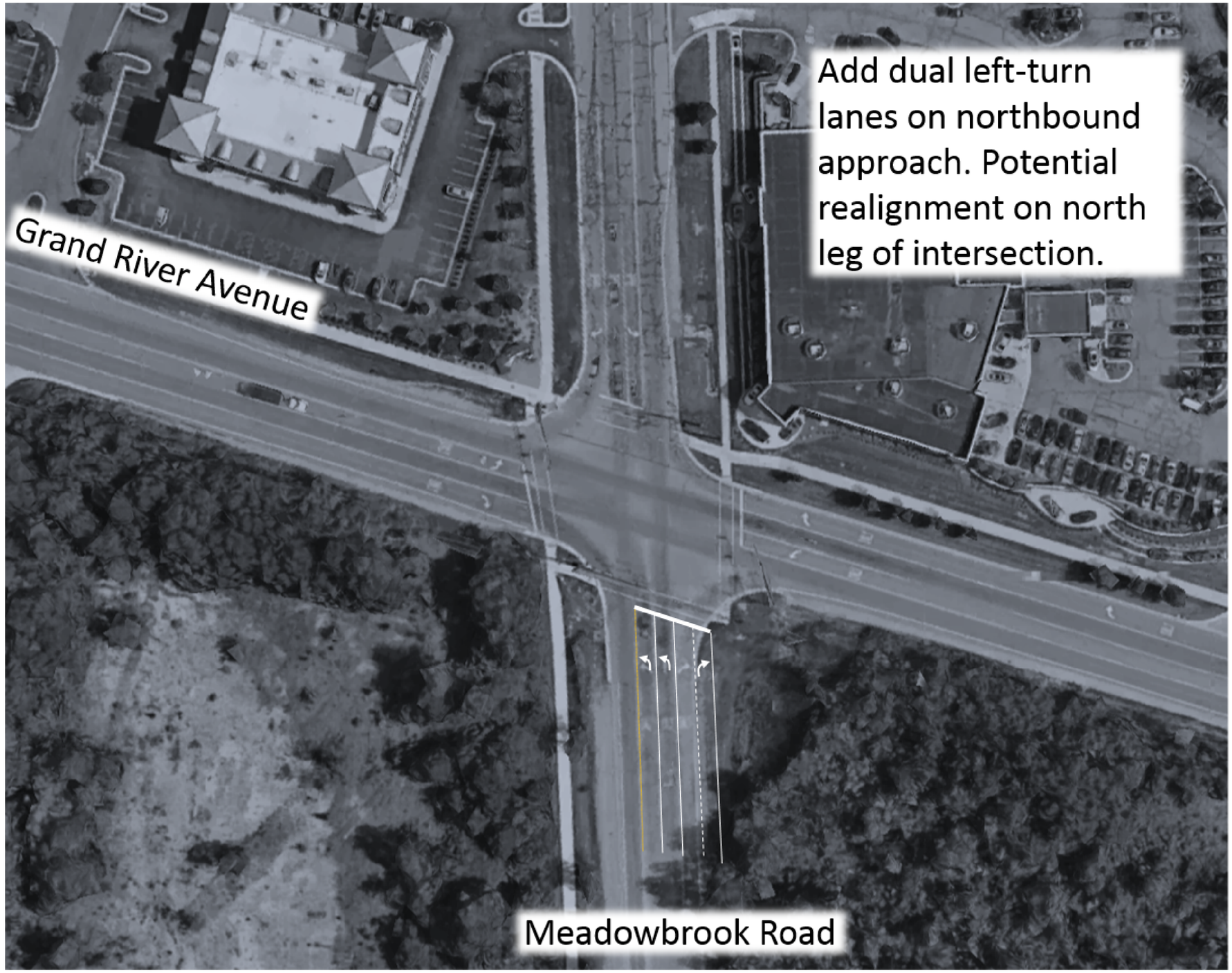
	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM		NOVI ROAD/GRAND RIVER AVENUE INTERSECTION MITIGATION CONCEPT	FIGURE 10A

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-10A_NOVI RD-GRAND RIVER INTERSECTION MIT CONCEPT



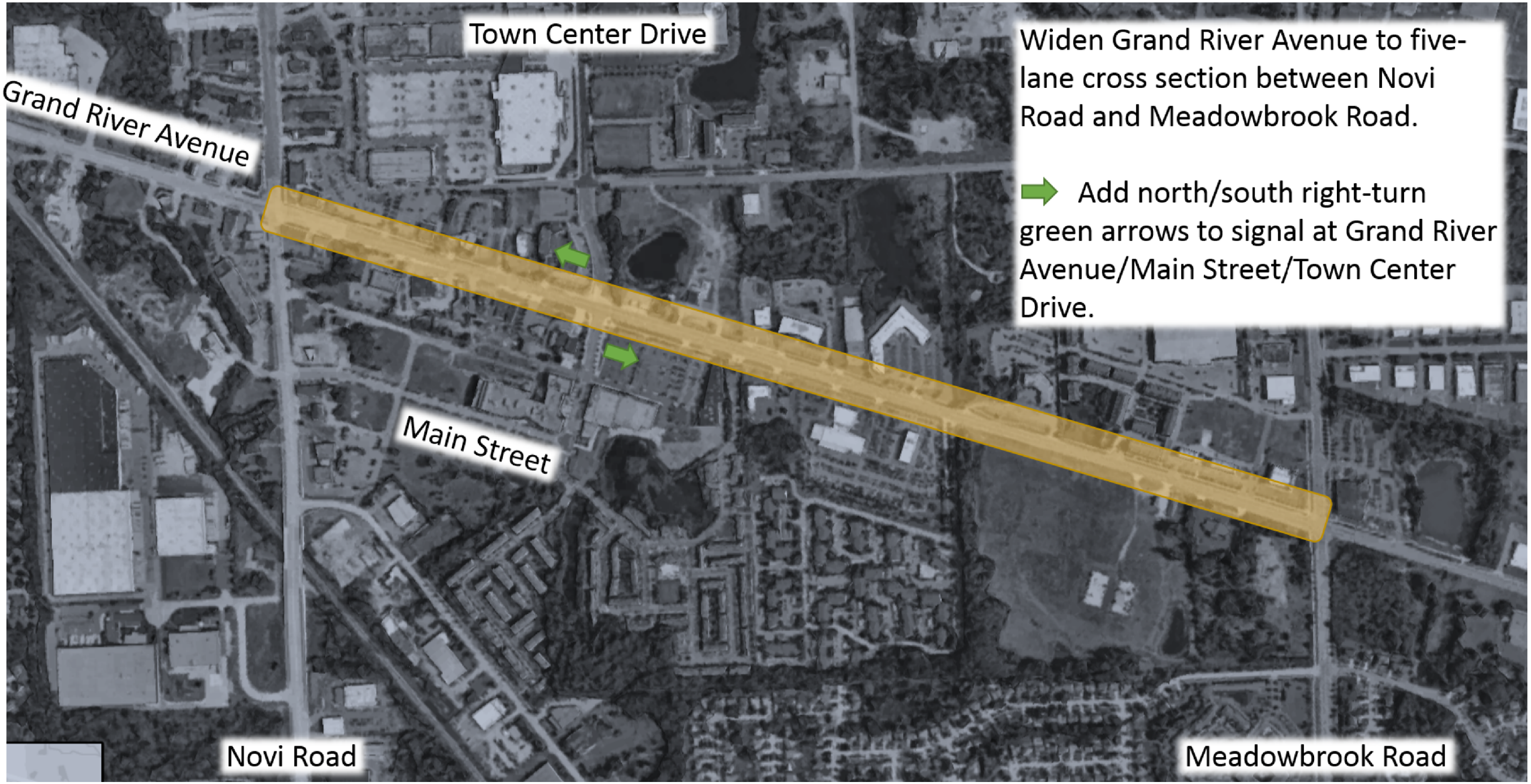
	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM		NOVI ROAD/TEN MILE INTERSECTION MITIGATION CONCEPT	FIGURE 10B

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-10B_NOVI RD-TEN MI INTERSECTION MIT CONCEPT



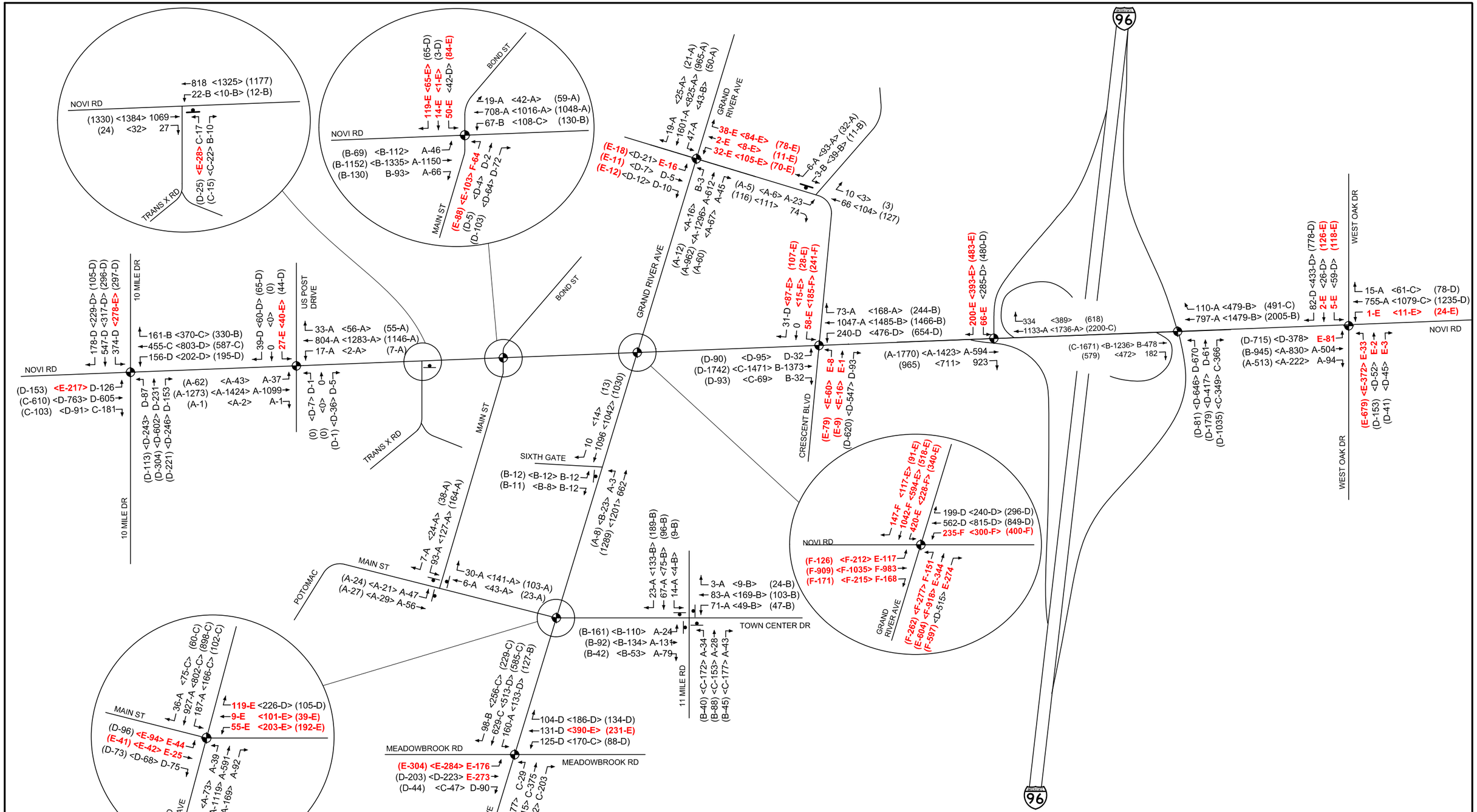
	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM		GRAND RIVER AVENUE/MEADOWBROOK ROAD INTERSECTION MITIGATION CONCEPT	FIGURE 10C

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-10C_GRAND RIVER AVENUE MEADOWBROOK ROAD INTERTSECTION MIT CONCEPT



	LEGEND	NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY	
AECOM		GRAND RIVER AVENUE MITIGATION CONCEPT	FIGURE 10D

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-10D_GRAND RIVER AVENUE MITIGATION CONCEPT



NOTE: MANY POORLY OPERATING TURNING MOVEMENTS ARE PROJECTED TO OPERATE WITH IMPROVED LOS, WITH ROADWAY IMPROVEMENTS ASSUMED TO BE IN PLACE. THIS IS PRIMARILY TRUE AT THE NOVI ROAD/TEN MILE ROAD AND GRAND RIVER AVENUE/MEADOWBROOK ROAD INTERSECTIONS.

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- LANE MOVEMENT

XXX-X - AM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
<XXX-X> - PM-PEAK WEEKDAY TRAFFIC VOLUME & LOS
(XXX-X) - SATURDAY PEAK TRAFFIC VOLUME & LOS

AECOM

NOVI RD / GRAND RIVER AVE AREA TRAFFIC IMPACT STUDY

FUTURE (2028) AM, PM AND SATURDAY PEAK-HOUR VOLUMES AND LEVELS OF SERVICE (W/MITIGATION)

FIGURE 11

G:\GrandRapids\DCS\Projects\12944755\Engineering\Traffic\60528219 - Novi POs\Novi_Grand River TIS\CADD-11_FUTURE (MITIGATION) 2028 VOLUMES & LOS

APPENDIX A. Turning Movement Counts

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ West Oaks / Twelve Oaks Mall
Site Code:
Start Date: 03/15/2018

Turning Movement Data

Start Time	West Oaks Dr Eastbound					Twelve Oaks Mall Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	2	0	18	0	20	8	1	0	0	9	16	77	13	0	106	0	128	2	0	130	265
7:15 AM	1	1	14	0	16	3	0	0	0	3	21	77	10	0	108	1	140	1	0	142	269
7:30 AM	2	0	17	0	19	0	0	1	0	1	5	99	16	0	120	1	171	1	0	173	313
7:45 AM	2	1	14	0	17	5	0	1	0	6	23	138	28	0	189	0	202	5	0	207	419
Hourly Total	7	2	63	0	72	16	1	2	0	19	65	391	67	0	523	2	641	9	0	652	1266
8:00 AM	2	0	27	0	29	5	1	1	0	7	15	91	13	0	119	1	163	2	0	166	321
8:15 AM	0	1	17	0	18	8	1	1	0	10	19	94	24	0	137	0	159	3	0	162	327
8:30 AM	1	0	20	0	21	13	0	0	0	13	20	109	24	0	153	0	147	4	0	151	338
8:45 AM	6	1	18	0	25	6	0	1	0	7	31	95	34	0	160	0	164	6	0	170	362
Hourly Total	9	2	82	0	93	32	2	3	0	37	85	389	95	0	569	1	633	15	0	649	1348
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	16	7	108	0	131	105	16	7	0	128	97	137	57	0	291	4	192	7	0	203	753
4:15 PM	17	2	89	0	108	90	15	7	0	112	101	153	55	0	309	4	184	12	0	200	729
4:30 PM	18	8	87	0	113	96	17	8	0	121	108	163	50	0	321	2	195	12	0	209	764
4:45 PM	14	6	121	0	141	85	10	9	0	104	95	164	45	1	304	2	202	13	0	217	766
Hourly Total	65	23	405	0	493	376	58	31	0	465	401	617	207	1	1225	12	773	44	0	829	3012
5:00 PM	6	6	117	0	129	92	19	10	0	121	103	200	46	0	349	1	246	14	0	261	860
5:15 PM	20	7	100	0	127	90	11	14	0	115	80	166	54	0	300	3	224	15	0	242	784
5:30 PM	15	8	86	0	109	90	14	9	0	113	77	154	55	0	286	5	240	9	0	254	762
5:45 PM	15	4	109	0	128	82	5	10	0	97	100	175	56	0	331	1	211	20	0	232	788
Hourly Total	56	25	412	0	493	354	49	43	0	446	360	695	211	0	1266	10	921	58	0	989	3194
Grand Total	137	52	962	0	1151	778	110	79	0	967	911	2092	580	1	3583	25	2968	126	0	3119	8820
Approach %	11.9	4.5	83.6	-	-	80.5	11.4	8.2	-	-	25.4	58.4	16.2	-	-	0.8	95.2	4.0	-	-	-
Total %	1.6	0.6	10.9	-	13.0	8.8	1.2	0.9	-	11.0	10.3	23.7	6.6	-	40.6	0.3	33.7	1.4	-	35.4	-
Lights	136	51	953	-	1140	774	108	78	-	960	904	2074	575	-	3553	25	2938	125	-	3088	8741
% Lights	99.3	98.1	99.1	-	99.0	99.5	98.2	98.7	-	99.3	99.2	99.1	99.1	-	99.2	100.0	99.0	99.2	-	99.0	99.1
Other Vehicles	1	1	9	-	11	4	2	1	-	7	7	18	5	-	30	0	30	1	-	31	79
% Other Vehicles	0.7	1.9	0.9	-	1.0	0.5	1.8	1.3	-	0.7	0.8	0.9	0.9	-	0.8	0.0	1.0	0.8	-	1.0	0.9
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ West Oaks / Twelve Oaks Mall
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (7:45 AM)

Start Time	West Oaks Dr Eastbound					Twelve Oaks Mall Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:45 AM	2	1	14	0	17	5	0	1	0	6	23	138	28	0	189	0	202	5	0	207	419
8:00 AM	2	0	27	0	29	5	1	1	0	7	15	91	13	0	119	1	163	2	0	166	321
8:15 AM	0	1	17	0	18	8	1	1	0	10	19	94	24	0	137	0	159	3	0	162	327
8:30 AM	1	0	20	0	21	13	0	0	0	13	20	109	24	0	153	0	147	4	0	151	338
Total	5	2	78	0	85	31	2	3	0	36	77	432	89	0	598	1	671	14	0	686	1405
Approach %	5.9	2.4	91.8	-	-	86.1	5.6	8.3	-	-	12.9	72.2	14.9	-	-	0.1	97.8	2.0	-	-	-
Total %	0.4	0.1	5.6	-	6.0	2.2	0.1	0.2	-	2.6	5.5	30.7	6.3	-	42.6	0.1	47.8	1.0	-	48.8	-
PHF	0.625	0.500	0.722	-	0.733	0.596	0.500	0.750	-	0.692	0.837	0.783	0.795	-	0.791	0.250	0.830	0.700	-	0.829	0.838
Lights	5	2	74	-	81	28	1	3	-	32	72	422	87	-	581	1	657	13	-	671	1365
% Lights	100.0	100.0	94.9	-	95.3	90.3	50.0	100.0	-	88.9	93.5	97.7	97.8	-	97.2	100.0	97.9	92.9	-	97.8	97.2
Other Vehicles	0	0	4	-	4	3	1	0	-	4	5	10	2	-	17	0	14	1	-	15	40
% Other Vehicles	0.0	0.0	5.1	-	4.7	9.7	50.0	0.0	-	11.1	6.5	2.3	2.2	-	2.8	0.0	2.1	7.1	-	2.2	2.8
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ West Oaks / Twelve Oaks Mall
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	West Oaks Dr Eastbound					Twelve Oaks Mall Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
5:00 PM	6	6	117	0	129	92	19	10	0	121	103	200	46	0	349	1	246	14	0	261	860
5:15 PM	20	7	100	0	127	90	11	14	0	115	80	166	54	0	300	3	224	15	0	242	784
5:30 PM	15	8	86	0	109	90	14	9	0	113	77	154	55	0	286	5	240	9	0	254	762
5:45 PM	15	4	109	0	128	82	5	10	0	97	100	175	56	0	331	1	211	20	0	232	788
Total	56	25	412	0	493	354	49	43	0	446	360	695	211	0	1266	10	921	58	0	989	3194
Approach %	11.4	5.1	83.6	-	-	79.4	11.0	9.6	-	-	28.4	54.9	16.7	-	-	1.0	93.1	5.9	-	-	-
Total %	1.8	0.8	12.9	-	15.4	11.1	1.5	1.3	-	14.0	11.3	21.8	6.6	-	39.6	0.3	28.8	1.8	-	31.0	-
PHF	0.700	0.781	0.880	-	0.955	0.962	0.645	0.768	-	0.921	0.874	0.869	0.942	-	0.907	0.500	0.936	0.725	-	0.947	0.928
Lights	56	25	411	-	492	353	49	43	-	445	360	695	211	-	1266	10	919	58	-	987	3190
% Lights	100.0	100.0	99.8	-	99.8	99.7	100.0	100.0	-	99.8	100.0	100.0	100.0	-	100.0	100.0	99.8	100.0	-	99.8	99.9
Other Vehicles	0	0	1	-	1	1	0	0	-	1	0	0	0	-	0	0	2	0	-	2	4
% Other Vehicles	0.0	0.0	0.2	-	0.2	0.3	0.0	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ West Oaks Drive / Twelve Oaks Mall (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Data

Start Time	West Oaks Dr Eastbound					Twelve Oaks Mall Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
1:00 PM	20	39	182	2	241	174	29	5	0	208	178	184	126	0	488	4	225	19	2	248	1185
1:15 PM	17	24	145	1	186	150	42	10	0	202	182	228	133	0	543	2	258	24	0	284	1215
1:30 PM	28	34	173	0	235	177	32	13	0	222	173	171	140	0	484	10	238	26	0	274	1215
1:45 PM	28	35	143	0	206	171	36	15	0	222	158	173	142	0	473	4	244	17	0	265	1166
Hourly Total	93	132	643	3	868	672	139	43	0	854	691	756	541	0	1988	20	965	86	2	1071	4781
2:00 PM	35	27	186	0	248	159	36	6	0	201	176	198	115	0	489	4	255	14	0	273	1211
2:15 PM	25	39	194	1	258	170	41	17	0	228	146	211	140	0	497	8	254	22	1	284	1267
2:30 PM	21	36	173	1	230	168	34	12	0	214	182	176	131	0	489	4	275	17	1	296	1229
2:45 PM	31	18	187	0	236	149	35	4	0	188	176	197	102	0	475	7	265	21	0	293	1192
Hourly Total	112	120	740	2	972	646	146	39	0	831	680	782	488	0	1950	23	1049	74	2	1146	4899
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	205	252	1383	5	1840	1318	285	82	0	1685	1371	1538	1029	0	3938	43	2014	160	4	2217	9680
Approach %	11.1	13.7	75.2	-	-	78.2	16.9	4.9	-	-	34.8	39.1	26.1	-	-	1.9	90.8	7.2	-	-	-
Total %	2.1	2.6	14.3	-	19.0	13.6	2.9	0.8	-	17.4	14.2	15.9	10.6	-	40.7	0.4	20.8	1.7	-	22.9	-
Lights	204	252	1380	-	1836	1317	284	81	-	1682	1370	1529	1027	-	3926	43	2006	160	-	2209	9653
% Lights	99.5	100.0	99.8	-	99.8	99.9	99.6	98.8	-	99.8	99.9	99.4	99.8	-	99.7	100.0	99.6	100.0	-	99.6	99.7
Other Vehicles	1	0	3	-	4	1	1	1	-	3	1	9	2	-	12	0	8	0	-	8	27
% Other Vehicles	0.5	0.0	0.2	-	0.2	0.1	0.4	1.2	-	0.2	0.1	0.6	0.2	-	0.3	0.0	0.4	0.0	-	0.4	0.3
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ West Oaks Drive / Twelve Oaks Mall (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Peak Hour Data (2:00 PM)

Start Time	West Oaks Dr Eastbound					Twelve Oaks Mall Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
2:00 PM	35	27	186	0	248	159	36	6	0	201	176	198	115	0	489	4	255	14	0	273	1211
2:15 PM	25	39	194	1	258	170	41	17	0	228	146	211	140	0	497	8	254	22	1	284	1267
2:30 PM	21	36	173	1	230	168	34	12	0	214	182	176	131	0	489	4	275	17	1	296	1229
2:45 PM	31	18	187	0	236	149	35	4	0	188	176	197	102	0	475	7	265	21	0	293	1192
Total	112	120	740	2	972	646	146	39	0	831	680	782	488	0	1950	23	1049	74	2	1146	4899
Approach %	11.5	12.3	76.1	-	-	77.7	17.6	4.7	-	-	34.9	40.1	25.0	-	-	2.0	91.5	6.5	-	-	-
Total %	2.3	2.4	15.1	-	19.8	13.2	3.0	0.8	-	17.0	13.9	16.0	10.0	-	39.8	0.5	21.4	1.5	-	23.4	-
PHF	0.800	0.769	0.954	-	0.942	0.950	0.890	0.574	-	0.911	0.934	0.927	0.871	-	0.981	0.719	0.954	0.841	-	0.968	0.967
Lights	111	120	739	-	970	646	146	38	-	830	679	777	487	-	1943	23	1044	74	-	1141	4884
% Lights	99.1	100.0	99.9	-	99.8	100.0	100.0	97.4	-	99.9	99.9	99.4	99.8	-	99.6	100.0	99.5	100.0	-	99.6	99.7
Other Vehicles	1	0	1	-	2	0	0	1	-	1	1	5	1	-	7	0	5	0	-	5	15
% Other Vehicles	0.9	0.0	0.1	-	0.2	0.0	0.0	2.6	-	0.1	0.1	0.6	0.2	-	0.4	0.0	0.5	0.0	-	0.4	0.3
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: WB I-96 Off-Ramp @ Novi Rd
Site Code:
Start Date: 04/19/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	133	6	47	0	186	0	50	0	0	50	0	153	29	0	182	418
7:15 AM	0	0	0	0	0	106	11	54	0	171	0	55	0	0	55	0	163	22	0	185	411
7:30 AM	0	0	0	0	0	118	12	61	1	191	0	73	0	0	73	0	162	29	0	191	455
7:45 AM	0	0	0	0	0	186	17	102	0	305	0	95	0	0	95	0	163	29	0	192	592
Hourly Total	0	0	0	0	0	543	46	264	1	853	0	273	0	0	273	0	641	109	0	750	1876
8:00 AM	0	0	0	0	0	129	4	63	0	196	0	80	0	0	80	0	171	31	0	202	478
8:15 AM	0	0	0	0	0	137	13	78	0	228	0	100	0	0	100	0	182	25	0	207	535
8:30 AM	0	0	0	0	0	122	22	95	0	239	0	101	0	0	101	0	173	28	0	201	541
8:45 AM	0	0	0	0	0	179	19	112	0	310	0	126	0	0	126	0	185	21	0	206	642
Hourly Total	0	0	0	0	0	567	58	348	0	973	0	407	0	0	407	0	711	105	0	816	2196
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	105	73	74	0	252	0	250	0	0	250	0	311	104	0	415	917
4:15 PM	0	0	0	0	0	113	64	74	0	251	0	233	0	0	233	0	279	120	0	399	883
4:30 PM	0	0	0	0	0	118	76	79	0	273	0	256	0	0	256	0	269	83	0	352	881
4:45 PM	0	0	0	0	0	123	79	91	0	293	0	272	0	0	272	0	267	113	0	380	945
Hourly Total	0	0	0	0	0	459	292	318	0	1069	0	1011	0	0	1011	0	1126	420	0	1546	3626
5:00 PM	0	0	0	0	0	112	100	85	0	297	0	291	0	0	291	0	301	120	0	421	1009
5:15 PM	0	0	0	0	0	132	91	95	0	318	0	269	0	0	269	0	327	138	0	465	1052
5:30 PM	0	0	0	0	0	126	111	63	0	300	0	251	0	0	251	0	349	110	0	459	1010
5:45 PM	0	0	0	0	0	136	95	89	0	320	0	271	0	0	271	0	324	88	0	412	1003
Hourly Total	0	0	0	0	0	506	397	332	0	1235	0	1082	0	0	1082	0	1301	456	0	1757	4074
6:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	2076	793	1262	1	4131	0	2773	0	0	2773	0	3779	1090	0	4869	11773
Approach %	0.0	0.0	0.0	-	-	50.3	19.2	30.5	-	-	0.0	100.0	0.0	-	-	0.0	77.6	22.4	-	-	-
Total %	0.0	0.0	0.0	-	0.0	17.6	6.7	10.7	-	35.1	0.0	23.6	0.0	-	23.6	0.0	32.1	9.3	-	41.4	-
Lights	0	0	0	-	0	2001	785	1231	-	4017	0	2747	0	-	2747	0	3723	1078	-	4801	11565
% Lights	-	-	-	-	-	96.4	99.0	97.5	-	97.2	-	99.1	-	-	99.1	-	98.5	98.9	-	98.6	98.2
Other Vehicles	0	0	0	-	0	75	8	31	-	114	0	26	0	-	26	0	56	12	-	68	208
% Other Vehicles	-	-	-	-	-	3.6	1.0	2.5	-	2.8	-	0.9	-	-	0.9	-	1.5	1.1	-	1.4	1.8
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: WB I-96 Off-Ramp @ Novi Rd
Site Code:
Start Date: 04/19/2018

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	0	0	0	0	0	129	4	63	0	196	0	80	0	0	80	0	171	31	0	202	478
8:15 AM	0	0	0	0	0	137	13	78	0	228	0	100	0	0	100	0	182	25	0	207	535
8:30 AM	0	0	0	0	0	122	22	95	0	239	0	101	0	0	101	0	173	28	0	201	541
8:45 AM	0	0	0	0	0	179	19	112	0	310	0	126	0	0	126	0	185	21	0	206	642
Total	0	0	0	0	0	567	58	348	0	973	0	407	0	0	407	0	711	105	0	816	2196
Approach %	0.0	0.0	0.0	-	-	58.3	6.0	35.8	-	-	0.0	100.0	0.0	-	-	0.0	87.1	12.9	-	-	-
Total %	0.0	0.0	0.0	-	0.0	25.8	2.6	15.8	-	44.3	0.0	18.5	0.0	-	18.5	0.0	32.4	4.8	-	37.2	-
PHF	0.000	0.000	0.000	-	0.000	0.792	0.659	0.777	-	0.785	0.000	0.808	0.000	-	0.808	0.000	0.961	0.847	-	0.986	0.855
Lights	0	0	0	-	0	540	56	340	-	936	0	398	0	-	398	0	693	102	-	795	2129
% Lights	-	-	-	-	-	95.2	96.6	97.7	-	96.2	-	97.8	-	-	97.8	-	97.5	97.1	-	97.4	96.9
Other Vehicles	0	0	0	-	0	27	2	8	-	37	0	9	0	-	9	0	18	3	-	21	67
% Other Vehicles	-	-	-	-	-	4.8	3.4	2.3	-	3.8	-	2.2	-	-	2.2	-	2.5	2.9	-	2.6	3.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
5:00 PM	0	0	0	0	0	112	100	85	0	297	0	291	0	0	291	0	301	120	0	421	1009
5:15 PM	0	0	0	0	0	132	91	95	0	318	0	269	0	0	269	0	327	138	0	465	1052
5:30 PM	0	0	0	0	0	126	111	63	0	300	0	251	0	0	251	0	349	110	0	459	1010
5:45 PM	0	0	0	0	0	136	95	89	0	320	0	271	0	0	271	0	324	88	0	412	1003
Total	0	0	0	0	0	506	397	332	0	1235	0	1082	0	0	1082	0	1301	456	0	1757	4074
Approach %	0.0	0.0	0.0	-	-	41.0	32.1	26.9	-	-	0.0	100.0	0.0	-	-	0.0	74.0	26.0	-	-	-
Total %	0.0	0.0	0.0	-	0.0	12.4	9.7	8.1	-	30.3	0.0	26.6	0.0	-	26.6	0.0	31.9	11.2	-	43.1	-
PHF	0.000	0.000	0.000	-	0.000	0.930	0.894	0.874	-	0.965	0.000	0.930	0.000	-	0.930	0.000	0.932	0.826	-	0.945	0.968
Lights	0	0	0	-	0	492	392	327	-	1211	0	1078	0	-	1078	0	1292	453	-	1745	4034
% Lights	-	-	-	-	-	97.2	98.7	98.5	-	98.1	-	99.6	-	-	99.6	-	99.3	99.3	-	99.3	99.0
Other Vehicles	0	0	0	-	0	14	5	5	-	24	0	4	0	-	4	0	9	3	-	12	40
% Other Vehicles	-	-	-	-	-	2.8	1.3	1.5	-	1.9	-	0.4	-	-	0.4	-	0.7	0.7	-	0.7	1.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: WB I-96 Off-Ramp @ Novi Rd (Sat)
Site Code:
Start Date: 04/21/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	0	0	0	0	0	169	34	235	0	438	1	338	0	0	339	0	381	98	0	479	1256
1:15 PM	0	0	0	0	0	134	35	236	0	405	1	355	0	0	356	0	438	117	0	555	1316
1:30 PM	0	0	0	0	0	160	31	236	0	427	0	380	0	0	380	0	418	110	0	528	1335
1:45 PM	0	0	0	0	0	154	43	243	0	440	0	369	0	0	369	0	414	103	0	517	1326
Hourly Total	0	0	0	0	0	617	143	950	0	1710	2	1442	0	0	1444	0	1651	428	0	2079	5233
2:00 PM	0	0	0	0	0	146	38	227	0	411	0	384	0	0	384	0	434	119	0	553	1348
2:15 PM	0	0	0	0	0	148	35	219	0	402	0	366	0	0	366	0	459	107	0	566	1334
2:30 PM	0	0	0	0	0	157	35	259	0	451	0	369	0	0	369	0	410	100	0	510	1330
2:45 PM	0	0	0	0	0	164	62	280	0	506	0	354	0	0	354	0	479	141	0	620	1480
Hourly Total	0	0	0	0	0	615	170	985	0	1770	0	1473	0	0	1473	0	1782	467	0	2249	5492
Grand Total	0	0	0	0	0	1232	313	1935	0	3480	2	2915	0	0	2917	0	3433	895	0	4328	10725
Approach %	0.0	0.0	0.0	-	-	35.4	9.0	55.6	-	-	0.1	99.9	0.0	-	-	0.0	79.3	20.7	-	-	-
Total %	0.0	0.0	0.0	-	0.0	11.5	2.9	18.0	-	32.4	0.0	27.2	0.0	-	27.2	0.0	32.0	8.3	-	40.4	-
Lights	0	0	0	-	0	1223	313	1933	-	3469	2	2906	0	-	2908	0	3427	893	-	4320	10697
% Lights	-	-	-	-	-	99.3	100.0	99.9	-	99.7	100.0	99.7	-	-	99.7	-	99.8	99.8	-	99.8	99.7
Other Vehicles	0	0	0	-	0	9	0	2	-	11	0	9	0	-	9	0	6	2	-	8	28
% Other Vehicles	-	-	-	-	-	0.7	0.0	0.1	-	0.3	0.0	0.3	-	-	0.3	-	0.2	0.2	-	0.2	0.3
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Turning Movement Peak Hour Data (2:00 PM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
2:00 PM	0	0	0	0	0	146	38	227	0	411	0	384	0	0	384	0	434	119	0	553	1348
2:15 PM	0	0	0	0	0	148	35	219	0	402	0	366	0	0	366	0	459	107	0	566	1334
2:30 PM	0	0	0	0	0	157	35	259	0	451	0	369	0	0	369	0	410	100	0	510	1330
2:45 PM	0	0	0	0	0	164	62	280	0	506	0	354	0	0	354	0	479	141	0	620	1480
Total	0	0	0	0	0	615	170	985	0	1770	0	1473	0	0	1473	0	1782	467	0	2249	5492
Approach %	0.0	0.0	0.0	-	-	34.7	9.6	55.6	-	-	0.0	100.0	0.0	-	-	0.0	79.2	20.8	-	-	-
Total %	0.0	0.0	0.0	-	0.0	11.2	3.1	17.9	-	32.2	0.0	26.8	0.0	-	26.8	0.0	32.4	8.5	-	41.0	-
PHF	0.000	0.000	0.000	-	0.000	0.938	0.685	0.879	-	0.875	0.000	0.959	0.000	-	0.959	0.000	0.930	0.828	-	0.907	0.928
Lights	0	0	0	-	0	610	170	985	-	1765	0	1471	0	-	1471	0	1780	465	-	2245	5481
% Lights	-	-	-	-	-	99.2	100.0	100.0	-	99.7	-	99.9	-	-	99.9	-	99.9	99.6	-	99.8	99.8
Other Vehicles	0	0	0	-	0	5	0	0	-	5	0	2	0	-	2	0	2	2	-	4	11
% Other Vehicles	-	-	-	-	-	0.8	0.0	0.0	-	0.3	-	0.1	-	-	0.1	-	0.1	0.4	-	0.2	0.2
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ I-96
EB Off Ramp
Site Code:
Start Date: 03/15/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	17	0	33	0	50	0	0	0	0	0	0	84	200	0	284	0	162	0	0	162	496
7:15 AM	13	0	29	0	42	0	0	0	0	0	0	104	214	0	318	0	220	0	0	220	580
7:30 AM	13	0	48	0	61	0	0	0	0	0	0	95	187	0	282	0	269	0	0	269	612
7:45 AM	18	0	45	0	63	0	0	0	0	0	0	147	178	0	325	0	279	0	0	279	667
Hourly Total	61	0	155	0	216	0	0	0	0	0	0	430	779	0	1209	0	930	0	0	930	2355
8:00 AM	13	0	30	0	43	0	0	0	0	0	0	112	215	0	327	0	217	0	0	217	587
8:15 AM	19	0	43	0	62	0	0	0	0	0	0	138	227	0	365	0	195	0	0	195	622
8:30 AM	18	0	45	0	63	0	0	0	0	0	1	148	200	0	349	0	199	0	0	199	611
8:45 AM	27	0	46	0	73	0	0	0	0	0	0	106	171	0	277	0	241	0	0	241	591
Hourly Total	77	0	164	0	241	0	0	0	0	0	1	504	813	0	1318	0	852	0	0	852	2411
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	41	0	64	0	105	0	0	0	1	0	0	293	210	0	503	0	318	0	0	318	926
4:15 PM	56	0	68	0	124	0	0	0	0	0	0	287	209	0	496	0	299	0	0	299	919
4:30 PM	60	0	67	0	127	0	0	0	0	0	0	318	214	0	532	0	315	0	0	315	974
4:45 PM	56	0	92	0	148	0	0	0	0	0	0	288	142	0	430	0	305	0	0	305	883
Hourly Total	213	0	291	0	504	0	0	0	1	0	0	1186	775	0	1961	0	1237	0	0	1237	3702
5:00 PM	77	0	80	0	157	0	0	0	0	0	0	350	175	0	525	0	366	0	0	366	1048
5:15 PM	65	0	83	0	148	0	0	0	0	0	0	268	136	0	404	0	341	0	0	341	893
5:30 PM	63	0	92	0	155	0	0	0	0	0	0	292	129	0	421	0	348	0	0	348	924
5:45 PM	66	0	67	0	133	0	0	0	0	0	0	303	142	0	445	0	382	0	0	382	960
Hourly Total	271	0	322	0	593	0	0	0	0	0	0	1213	582	0	1795	0	1437	0	0	1437	3825
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	622	0	932	0	1554	0	0	0	1	0	1	3333	2949	0	6283	0	4456	0	0	4456	12293
Approach %	40.0	0.0	60.0	-	-	0.0	0.0	0.0	-	-	0.0	53.0	46.9	-	-	0.0	100.0	0.0	-	-	-
Total %	5.1	0.0	7.6	-	12.6	0.0	0.0	0.0	-	0.0	0.0	27.1	24.0	-	51.1	0.0	36.2	0.0	-	36.2	-
Lights	616	0	914	-	1530	0	0	0	-	0	1	3286	2881	-	6168	0	4370	0	-	4370	12068
% Lights	99.0	-	98.1	-	98.5	-	-	-	-	-	100.0	98.6	97.7	-	98.2	-	98.1	-	-	98.1	98.2
Other Vehicles	6	0	18	-	24	0	0	0	-	0	0	47	68	-	115	0	86	0	-	86	225
% Other Vehicles	1.0	-	1.9	-	1.5	-	-	-	-	-	0.0	1.4	2.3	-	1.8	-	1.9	-	-	1.9	1.8
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ I-96
EB Off Ramp
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	13	0	48	0	61	0	0	0	0	0	0	95	187	0	282	0	269	0	0	269	612
7:45 AM	18	0	45	0	63	0	0	0	0	0	0	147	178	0	325	0	279	0	0	279	667
8:00 AM	13	0	30	0	43	0	0	0	0	0	0	112	215	0	327	0	217	0	0	217	587
8:15 AM	19	0	43	0	62	0	0	0	0	0	0	138	227	0	365	0	195	0	0	195	622
Total	63	0	166	0	229	0	0	0	0	0	0	492	807	0	1299	0	960	0	0	960	2488
Approach %	27.5	0.0	72.5	-	-	0.0	0.0	0.0	-	-	0.0	37.9	62.1	-	-	0.0	100.0	0.0	-	-	-
Total %	2.5	0.0	6.7	-	9.2	0.0	0.0	0.0	-	0.0	0.0	19.8	32.4	-	52.2	0.0	38.6	0.0	-	38.6	-
PHF	0.829	0.000	0.865	-	0.909	0.000	0.000	0.000	-	0.000	0.000	0.837	0.889	-	0.890	0.000	0.860	0.000	-	0.860	0.933
Lights	61	0	162	-	223	0	0	0	-	0	0	476	792	-	1268	0	930	0	-	930	2421
% Lights	96.8	-	97.6	-	97.4	-	-	-	-	-	-	96.7	98.1	-	97.6	-	96.9	-	-	96.9	97.3
Other Vehicles	2	0	4	-	6	0	0	0	-	0	0	16	15	-	31	0	30	0	-	30	67
% Other Vehicles	3.2	-	2.4	-	2.6	-	-	-	-	-	-	3.3	1.9	-	2.4	-	3.1	-	-	3.1	2.7
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ I-96
EB Off Ramp
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Eastbound Approach					Westbound Approach					Northbound Approach					Southbound Approach					
	Eastbound					Westbound					Northbound					Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
5:00 PM	77	0	80	0	157	0	0	0	0	0	0	350	175	0	525	0	366	0	0	366	1048
5:15 PM	65	0	83	0	148	0	0	0	0	0	0	268	136	0	404	0	341	0	0	341	893
5:30 PM	63	0	92	0	155	0	0	0	0	0	0	292	129	0	421	0	348	0	0	348	924
5:45 PM	66	0	67	0	133	0	0	0	0	0	0	303	142	0	445	0	382	0	0	382	960
Total	271	0	322	0	593	0	0	0	0	0	0	1213	582	0	1795	0	1437	0	0	1437	3825
Approach %	45.7	0.0	54.3	-	-	0.0	0.0	0.0	-	-	0.0	67.6	32.4	-	-	0.0	100.0	0.0	-	-	-
Total %	7.1	0.0	8.4	-	15.5	0.0	0.0	0.0	-	0.0	0.0	31.7	15.2	-	46.9	0.0	37.6	0.0	-	37.6	-
PHF	0.880	0.000	0.875	-	0.944	0.000	0.000	0.000	-	0.000	0.000	0.866	0.831	-	0.855	0.000	0.940	0.000	-	0.940	0.912
Lights	271	0	316	-	587	0	0	0	-	0	0	1211	578	-	1789	0	1424	0	-	1424	3800
% Lights	100.0	-	98.1	-	99.0	-	-	-	-	-	-	99.8	99.3	-	99.7	-	99.1	-	-	99.1	99.3
Other Vehicles	0	0	6	-	6	0	0	0	-	0	0	2	4	-	6	0	13	0	-	13	25
% Other Vehicles	0.0	-	1.9	-	1.0	-	-	-	-	-	-	0.2	0.7	-	0.3	-	0.9	-	-	0.9	0.7
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ I-96
EB Off-ramp (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	119	0	100	0	219	0	0	0	0	0	0	377	174	0	551	0	461	0	0	461	1231
1:15 PM	108	0	88	0	196	0	0	0	0	0	0	360	198	0	558	0	398	0	0	398	1152
1:30 PM	112	0	103	0	215	0	0	0	0	0	0	359	195	0	554	0	480	0	0	480	1249
1:45 PM	110	0	88	0	198	0	0	0	0	0	0	351	198	0	549	0	430	0	0	430	1177
Hourly Total	449	0	379	0	828	0	0	0	0	0	0	1447	765	0	2212	0	1769	0	0	1769	4809
2:00 PM	116	0	81	0	197	0	0	0	0	0	0	367	183	0	550	0	450	0	0	450	1197
2:15 PM	119	0	94	0	213	0	0	0	0	0	0	403	193	0	596	0	448	0	0	448	1257
2:30 PM	126	0	82	0	208	0	0	0	0	0	0	361	207	0	568	0	437	0	0	437	1213
2:45 PM	123	0	81	0	204	0	0	0	0	0	0	364	175	0	539	0	451	0	0	451	1194
Hourly Total	484	0	338	0	822	0	0	0	0	0	0	1495	758	0	2253	0	1786	0	0	1786	4861
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Grand Total	933	0	717	0	1650	0	0	0	0	0	0	2942	1524	0	4466	0	3555	0	0	3555	9671
Approach %	56.5	0.0	43.5	-	-	0.0	0.0	0.0	-	-	0.0	65.9	34.1	-	-	0.0	100.0	0.0	-	-	-
Total %	9.6	0.0	7.4	-	17.1	0.0	0.0	0.0	-	0.0	0.0	30.4	15.8	-	46.2	0.0	36.8	0.0	-	36.8	-
Lights	930	0	707	-	1637	0	0	0	-	0	0	2935	1514	-	4449	0	3544	0	-	3544	9630
% Lights	99.7	-	98.6	-	99.2	-	-	-	-	-	-	99.8	99.3	-	99.6	-	99.7	-	-	99.7	99.6
Other Vehicles	3	0	10	-	13	0	0	0	-	0	0	7	10	-	17	0	11	0	-	11	41
% Other Vehicles	0.3	-	1.4	-	0.8	-	-	-	-	-	-	0.2	0.7	-	0.4	-	0.3	-	-	0.3	0.4
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ I-96
EB Off-ramp (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Peak Hour Data (1:30 PM)

Start Time	Eastbound Approach					Westbound Approach					Northbound Approach					Southbound Approach					
	Eastbound					Westbound					Northbound					Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:30 PM	112	0	103	0	215	0	0	0	0	0	0	359	195	0	554	0	480	0	0	480	1249
1:45 PM	110	0	88	0	198	0	0	0	0	0	0	351	198	0	549	0	430	0	0	430	1177
2:00 PM	116	0	81	0	197	0	0	0	0	0	0	367	183	0	550	0	450	0	0	450	1197
2:15 PM	119	0	94	0	213	0	0	0	0	0	0	403	193	0	596	0	448	0	0	448	1257
Total	457	0	366	0	823	0	0	0	0	0	0	1480	769	0	2249	0	1808	0	0	1808	4880
Approach %	55.5	0.0	44.5	-	-	0.0	0.0	0.0	-	-	0.0	65.8	34.2	-	-	0.0	100.0	0.0	-	-	-
Total %	9.4	0.0	7.5	-	16.9	0.0	0.0	0.0	-	0.0	0.0	30.3	15.8	-	46.1	0.0	37.0	0.0	-	37.0	-
PHF	0.960	0.000	0.888	-	0.957	0.000	0.000	0.000	-	0.000	0.000	0.918	0.971	-	0.943	0.000	0.942	0.000	-	0.942	0.971
Lights	455	0	361	-	816	0	0	0	-	0	0	1475	763	-	2238	0	1804	0	-	1804	4858
% Lights	99.6	-	98.6	-	99.1	-	-	-	-	-	-	99.7	99.2	-	99.5	-	99.8	-	-	99.8	99.5
Other Vehicles	2	0	5	-	7	0	0	0	-	0	0	5	6	-	11	0	4	0	-	4	22
% Other Vehicles	0.4	-	1.4	-	0.9	-	-	-	-	-	-	0.3	0.8	-	0.5	-	0.2	-	-	0.2	0.5
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ Crescent Boulevard
Site Code:
Start Date: 03/15/2018

Turning Movement Data

Start Time	Crescent Blvd Eastbound					Crescent Blvd Westbound					Novi Rd Northbound					Novi Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	2	0	1	0	3	1	0	9	0	10	1	269	1	0	271	29	175	1	0	205	489
7:15 AM	0	0	3	0	3	0	0	23	0	23	1	280	1	0	282	27	209	3	0	239	547
7:30 AM	2	0	2	0	4	0	0	12	0	12	2	286	2	0	290	39	277	4	0	320	626
7:45 AM	0	0	1	0	1	0	0	18	0	18	0	306	0	0	306	48	279	1	0	328	653
Hourly Total	4	0	7	0	11	1	0	62	0	63	4	1141	4	0	1149	143	940	9	0	1092	2315
8:00 AM	5	0	2	0	7	2	1	21	0	24	0	282	7	0	289	48	192	6	0	246	566
8:15 AM	1	0	1	0	2	0	0	16	0	16	0	355	6	0	361	56	200	1	0	257	636
8:30 AM	0	0	0	0	0	1	1	18	0	20	0	330	2	0	332	52	185	0	0	237	589
8:45 AM	1	0	6	0	7	1	0	12	0	13	1	258	1	0	260	57	225	8	0	290	570
Hourly Total	7	0	9	0	16	4	2	67	0	73	1	1225	16	0	1242	213	802	15	0	1030	2361
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	17	5	16	0	38	18	1	155	0	174	7	339	11	0	357	85	284	13	0	382	951
4:15 PM	4	4	9	0	17	11	2	108	0	121	7	381	14	0	402	86	264	14	0	364	904
4:30 PM	12	2	6	0	20	7	2	133	0	142	7	401	16	0	424	100	273	16	0	389	975
4:45 PM	19	4	12	0	35	11	0	100	0	111	10	327	19	0	356	88	266	26	0	380	882
Hourly Total	52	15	43	0	110	47	5	496	0	548	31	1448	60	0	1539	359	1087	69	0	1515	3712
5:00 PM	15	3	9	0	27	13	2	142	0	157	7	363	13	0	383	100	334	15	0	449	1016
5:15 PM	20	3	16	0	39	11	6	119	0	136	14	286	18	0	318	96	307	18	0	421	914
5:30 PM	16	5	8	0	29	17	4	94	0	115	7	314	14	0	335	110	317	15	0	442	921
5:45 PM	24	3	5	0	32	7	3	124	0	134	7	307	15	0	329	113	320	15	0	448	943
Hourly Total	75	14	38	0	127	48	15	479	0	542	35	1270	60	0	1365	419	1278	63	0	1760	3794
Grand Total	138	29	97	0	264	100	22	1104	0	1226	71	5084	140	0	5295	1134	4107	156	0	5397	12182
Approach %	52.3	11.0	36.7	-	-	8.2	1.8	90.0	-	-	1.3	96.0	2.6	-	-	21.0	76.1	2.9	-	-	-
Total %	1.1	0.2	0.8	-	2.2	0.8	0.2	9.1	-	10.1	0.6	41.7	1.1	-	43.5	9.3	33.7	1.3	-	44.3	-
Lights	138	29	93	-	260	100	22	1097	-	1219	70	4966	137	-	5173	1129	4004	154	-	5287	11939
% Lights	100.0	100.0	95.9	-	98.5	100.0	100.0	99.4	-	99.4	98.6	97.7	97.9	-	97.7	99.6	97.5	98.7	-	98.0	98.0
Other Vehicles	0	0	4	-	4	0	0	7	-	7	1	118	3	-	122	5	103	2	-	110	243
% Other Vehicles	0.0	0.0	4.1	-	1.5	0.0	0.0	0.6	-	0.6	1.4	2.3	2.1	-	2.3	0.4	2.5	1.3	-	2.0	2.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ Crescent Boulevard
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Crescent Blvd Eastbound					Crescent Blvd Westbound					Novi Rd Northbound					Novi Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	2	0	2	0	4	0	0	12	0	12	2	286	2	0	290	39	277	4	0	320	626
7:45 AM	0	0	1	0	1	0	0	18	0	18	0	306	0	0	306	48	279	1	0	328	653
8:00 AM	5	0	2	0	7	2	1	21	0	24	0	282	7	0	289	48	192	6	0	246	566
8:15 AM	1	0	1	0	2	0	0	16	0	16	0	355	6	0	361	56	200	1	0	257	636
Total	8	0	6	0	14	2	1	67	0	70	2	1229	15	0	1246	191	948	12	0	1151	2481
Approach %	57.1	0.0	42.9	-	-	2.9	1.4	95.7	-	-	0.2	98.6	1.2	-	-	16.6	82.4	1.0	-	-	-
Total %	0.3	0.0	0.2	-	0.6	0.1	0.0	2.7	-	2.8	0.1	49.5	0.6	-	50.2	7.7	38.2	0.5	-	46.4	-
PHF	0.400	0.000	0.750	-	0.500	0.250	0.250	0.798	-	0.729	0.250	0.865	0.536	-	0.863	0.853	0.849	0.500	-	0.877	0.950
Lights	8	0	6	-	14	2	1	66	-	69	2	1197	13	-	1212	188	917	12	-	1117	2412
% Lights	100.0	-	100.0	-	100.0	100.0	100.0	98.5	-	98.6	100.0	97.4	86.7	-	97.3	98.4	96.7	100.0	-	97.0	97.2
Other Vehicles	0	0	0	-	0	0	0	1	-	1	0	32	2	-	34	3	31	0	-	34	69
% Other Vehicles	0.0	-	0.0	-	0.0	0.0	0.0	1.5	-	1.4	0.0	2.6	13.3	-	2.7	1.6	3.3	0.0	-	3.0	2.8
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Road @ Crescent Boulevard
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Crescent Blvd Eastbound					Crescent Blvd Westbound					Novi Rd Northbound					Novi Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
5:00 PM	15	3	9	0	27	13	2	142	0	157	7	363	13	0	383	100	334	15	0	449	1016
5:15 PM	20	3	16	0	39	11	6	119	0	136	14	286	18	0	318	96	307	18	0	421	914
5:30 PM	16	5	8	0	29	17	4	94	0	115	7	314	14	0	335	110	317	15	0	442	921
5:45 PM	24	3	5	0	32	7	3	124	0	134	7	307	15	0	329	113	320	15	0	448	943
Total	75	14	38	0	127	48	15	479	0	542	35	1270	60	0	1365	419	1278	63	0	1760	3794
Approach %	59.1	11.0	29.9	-	-	8.9	2.8	88.4	-	-	2.6	93.0	4.4	-	-	23.8	72.6	3.6	-	-	-
Total %	2.0	0.4	1.0	-	3.3	1.3	0.4	12.6	-	14.3	0.9	33.5	1.6	-	36.0	11.0	33.7	1.7	-	46.4	-
PHF	0.781	0.700	0.594	-	0.814	0.706	0.625	0.843	-	0.863	0.625	0.875	0.833	-	0.891	0.927	0.957	0.875	-	0.980	0.934
Lights	75	14	38	-	127	48	15	477	-	540	35	1262	60	-	1357	419	1256	63	-	1738	3762
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	99.6	-	99.6	100.0	99.4	100.0	-	99.4	100.0	98.3	100.0	-	98.8	99.2
Other Vehicles	0	0	0	-	0	0	0	2	-	2	0	8	0	-	8	0	22	0	-	22	32
% Other Vehicles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.4	-	0.4	0.0	0.6	0.0	-	0.6	0.0	1.7	0.0	-	1.3	0.8
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ Crescent Blvd (Sat)
Site Code:
Start Date: 04/21/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	32	4	13	0	49	19	4	143	0	166	11	325	24	0	360	165	272	20	0	457	1032
1:15 PM	34	14	12	0	60	20	3	126	0	149	13	315	28	0	356	155	285	30	0	470	1035
1:30 PM	23	7	16	0	46	29	4	138	0	171	9	350	26	0	385	171	315	24	2	510	1112
1:45 PM	30	3	13	0	46	21	2	132	0	155	12	307	23	0	342	158	298	19	0	475	1018
Hourly Total	119	28	54	0	201	89	13	539	0	641	45	1297	101	0	1443	649	1170	93	2	1912	4197
2:00 PM	30	4	12	0	46	9	2	145	0	156	16	355	29	0	400	116	289	27	0	432	1034
2:15 PM	31	13	14	0	58	16	2	154	0	172	10	348	20	0	378	171	285	28	0	484	1092
2:30 PM	25	2	15	0	42	24	1	138	0	163	8	356	18	0	382	154	286	23	0	463	1050
2:45 PM	23	8	15	0	46	22	4	131	0	157	4	377	18	0	399	156	315	25	0	496	1098
Hourly Total	109	27	56	0	192	71	9	568	0	648	38	1436	85	0	1559	597	1175	103	0	1875	4274
Grand Total	228	55	110	0	393	160	22	1107	0	1289	83	2733	186	0	3002	1246	2345	196	2	3787	8471
Approach %	58.0	14.0	28.0	-	-	12.4	1.7	85.9	-	-	2.8	91.0	6.2	-	-	32.9	61.9	5.2	-	-	-
Total %	2.7	0.6	1.3	-	4.6	1.9	0.3	13.1	-	15.2	1.0	32.3	2.2	-	35.4	14.7	27.7	2.3	-	44.7	-
Lights	227	55	110	-	392	160	22	1104	-	1286	83	2714	185	-	2982	1241	2338	195	-	3774	8434
% Lights	99.6	100.0	100.0	-	99.7	100.0	100.0	99.7	-	99.8	100.0	99.3	99.5	-	99.3	99.6	99.7	99.5	-	99.7	99.6
Other Vehicles	1	0	0	-	1	0	0	3	-	3	0	19	1	-	20	5	7	1	-	13	37
% Other Vehicles	0.4	0.0	0.0	-	0.3	0.0	0.0	0.3	-	0.2	0.0	0.7	0.5	-	0.7	0.4	0.3	0.5	-	0.3	0.4
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (2:00 PM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
2:00 PM	30	4	12	0	46	9	2	145	0	156	16	355	29	0	400	116	289	27	0	432	1034
2:15 PM	31	13	14	0	58	16	2	154	0	172	10	348	20	0	378	171	285	28	0	484	1092
2:30 PM	25	2	15	0	42	24	1	138	0	163	8	356	18	0	382	154	286	23	0	463	1050
2:45 PM	23	8	15	0	46	22	4	131	0	157	4	377	18	0	399	156	315	25	0	496	1098
Total	109	27	56	0	192	71	9	568	0	648	38	1436	85	0	1559	597	1175	103	0	1875	4274
Approach %	56.8	14.1	29.2	-	-	11.0	1.4	87.7	-	-	2.4	92.1	5.5	-	-	31.8	62.7	5.5	-	-	-
Total %	2.6	0.6	1.3	-	4.5	1.7	0.2	13.3	-	15.2	0.9	33.6	2.0	-	36.5	14.0	27.5	2.4	-	43.9	-
PHF	0.879	0.519	0.933	-	0.828	0.740	0.563	0.922	-	0.942	0.594	0.952	0.733	-	0.974	0.873	0.933	0.920	-	0.945	0.973
Lights	109	27	56	-	192	71	9	565	-	645	38	1424	85	-	1547	596	1172	103	-	1871	4255
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	99.5	-	99.5	100.0	99.2	100.0	-	99.2	99.8	99.7	100.0	-	99.8	99.6
Other Vehicles	0	0	0	-	0	0	0	3	-	3	0	12	0	-	12	1	3	0	-	4	19
% Other Vehicles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.5	-	0.5	0.0	0.8	0.0	-	0.8	0.2	0.3	0.0	-	0.2	0.4
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ Grand River Ave (Sat)
Site Code:
Start Date: 04/21/2018

Turning Movement Data

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	71	73	28	0	172	45	96	94	0	235	37	219	22	0	278	70	177	57	0	304	989
1:15 PM	59	82	19	0	160	40	98	86	0	224	15	192	18	0	225	79	169	62	0	310	919
1:30 PM	74	80	14	0	168	32	107	106	0	245	24	207	19	0	250	76	205	63	0	344	1007
1:45 PM	54	71	16	0	141	47	112	106	0	265	23	196	25	0	244	79	177	74	0	330	980
Hourly Total	258	306	77	0	641	164	413	392	0	969	99	814	84	0	997	304	728	256	0	1288	3895
2:00 PM	72	78	13	0	163	45	123	119	0	287	21	177	14	0	212	47	146	73	0	266	928
2:15 PM	78	87	19	0	184	32	133	100	0	265	23	207	19	0	249	58	172	102	0	332	1030
2:30 PM	84	105	14	0	203	41	121	106	0	268	21	154	14	0	189	67	165	70	0	302	962
2:45 PM	114	133	12	0	259	39	110	97	0	246	25	181	26	0	232	60	171	68	0	299	1036
Hourly Total	348	403	58	0	809	157	487	422	0	1066	90	719	73	0	882	232	654	313	0	1199	3956
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	606	709	135	0	1450	321	900	814	0	2035	189	1533	157	0	1879	536	1382	569	0	2487	7851
Approach %	41.8	48.9	9.3	-	-	15.8	44.2	40.0	-	-	10.1	81.6	8.4	-	-	21.6	55.6	22.9	-	-	-
Total %	7.7	9.0	1.7	-	18.5	4.1	11.5	10.4	-	25.9	2.4	19.5	2.0	-	23.9	6.8	17.6	7.2	-	31.7	-
Lights	604	701	134	-	1439	321	895	810	-	2026	188	1523	157	-	1868	535	1375	565	-	2475	7808
% Lights	99.7	98.9	99.3	-	99.2	100.0	99.4	99.5	-	99.6	99.5	99.3	100.0	-	99.4	99.8	99.5	99.3	-	99.5	99.5
Other Vehicles	2	8	1	-	11	0	5	4	-	9	1	10	0	-	11	1	7	4	-	12	43
% Other Vehicles	0.3	1.1	0.7	-	0.8	0.0	0.6	0.5	-	0.4	0.5	0.7	0.0	-	0.6	0.2	0.5	0.7	-	0.5	0.5
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Turning Movement Peak Hour Data (2:00 PM)

Start Time	Eastbound Approach Eastbound					Westbound Approach Westbound					Northbound Approach Northbound					Southbound Approach Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
2:00 PM	72	78	13	0	163	45	123	119	0	287	21	177	14	0	212	47	146	73	0	266	928
2:15 PM	78	87	19	0	184	32	133	100	0	265	23	207	19	0	249	58	172	102	0	332	1030
2:30 PM	84	105	14	0	203	41	121	106	0	268	21	154	14	0	189	67	165	70	0	302	962
2:45 PM	114	133	12	0	259	39	110	97	0	246	25	181	26	0	232	60	171	68	0	299	1036
Total	348	403	58	0	809	157	487	422	0	1066	90	719	73	0	882	232	654	313	0	1199	3956
Approach %	43.0	49.8	7.2	-	-	14.7	45.7	39.6	-	-	10.2	81.5	8.3	-	-	19.3	54.5	26.1	-	-	-
Total %	8.8	10.2	1.5	-	20.4	4.0	12.3	10.7	-	26.9	2.3	18.2	1.8	-	22.3	5.9	16.5	7.9	-	30.3	-
PHF	0.763	0.758	0.763	-	0.781	0.872	0.915	0.887	-	0.929	0.900	0.868	0.702	-	0.886	0.866	0.951	0.767	-	0.903	0.955
Lights	348	401	57	-	806	157	484	419	-	1060	89	713	73	-	875	231	650	312	-	1193	3934
% Lights	100.0	99.5	98.3	-	99.6	100.0	99.4	99.3	-	99.4	98.9	99.2	100.0	-	99.2	99.6	99.4	99.7	-	99.5	99.4
Other Vehicles	0	2	1	-	3	0	3	3	-	6	1	6	0	-	7	1	4	1	-	6	22
% Other Vehicles	0.0	0.5	1.7	-	0.4	0.0	0.6	0.7	-	0.6	1.1	0.8	0.0	-	0.8	0.4	0.6	0.3	-	0.5	0.6
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- Main St 1-3 PM Weekend Count
Site Code : 00000000
Start Date : 3/24/2018
Page No : 1

Groups Printed- Cars - Trucks - Peds

	NOVI From North					MAIN From East					NOVI From South					MAIN From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	11	192	22	0	225	15	4	18	0	37	30	245	6	0	281	9	1	18	0	28	571
01:15 PM	5	204	13	0	222	9	0	11	0	20	24	222	17	0	263	11	1	10	0	22	527
01:30 PM	4	202	17	0	223	13	0	15	0	28	19	241	9	0	269	7	0	11	0	18	538
01:45 PM	5	207	20	1	233	11	1	10	0	22	24	204	6	0	234	4	1	10	0	15	504
Total	25	805	72	1	903	48	5	54	0	107	97	912	38	0	1047	31	3	49	0	83	2140
02:00 PM	5	200	16	0	221	13	0	10	0	23	17	198	10	0	225	7	1	11	0	19	488
02:15 PM	2	194	14	3	213	7	0	15	0	22	14	211	7	0	232	11	0	13	0	24	491
02:30 PM	5	205	13	0	223	4	2	14	0	20	19	204	13	0	236	10	1	10	0	21	500
02:45 PM	6	225	14	0	245	10	0	13	0	23	12	198	8	2	220	12	4	9	1	26	514
Total	18	824	57	3	902	34	2	52	0	88	62	811	38	2	913	40	6	43	1	90	1993
Grand Total	43	1629	129	4	1805	82	7	106	0	195	159	1723	76	2	1960	71	9	92	1	173	4133
Apprch %	2.4	90.2	7.1	0.2		42.1	3.6	54.4	0		8.1	87.9	3.9	0.1		41	5.2	53.2	0.6		
Total %	1	39.4	3.1	0.1	43.7	2	0.2	2.6	0	4.7	3.8	41.7	1.8	0	47.4	1.7	0.2	2.2	0	4.2	
Cars	43	1628	129	4	1804	80	7	106	0	193	159	1716	76	2	1953	71	9	92	1	173	4123
% Cars	100	99.9	100	100	99.9	97.6	100	100	0	99	100	99.6	100	100	99.6	100	100	100	100	100	99.8
Trucks	0	0	0	0	0	2	0	0	0	2	0	2	0	0	2	0	0	0	0	0	4
% Trucks	0	0	0	0	0	2.4	0	0	0	1	0	0.1	0	0	0.1	0	0	0	0	0	0.1
Peds	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
% Peds	0	0.1	0	0	0.1	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.1

File Name : Novi Rd- Main St 1-3 PM Weekend Count
Site Code : 00000000
Start Date : 3/24/2018
Page No : 2

	NOVI From North					MAIN From East					NOVI From South					MAIN From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	**11**	192	**22**	0	225	**15**	**4**	**18**	0	**37**	**30**	**245**	6	0	**281**	9	**1**	**18**	0	**28**	**571**
01:15 PM	5	204	13	0	222	9	0	11	0	20	24	222	**17**	0	263	**11**	1	10	0	22	527
01:30 PM	4	202	17	0	223	13	0	15	0	28	19	241	9	0	269	7	0	11	0	18	538
01:45 PM	5	**207**	20	**1**	**233**	11	1	10	0	22	24	204	6	0	234	4	1	10	0	15	504
Total Volume	25	805	72	1	903	48	5	54	0	107	97	912	38	0	1047	31	3	49	0	83	2140
% App. Total	2.8	89.1	8	0.1		44.9	4.7	50.5	0		9.3	87.1	3.6	0		37.3	3.6	59	0		
PHF	.568	.972	.818	.250	.969	.800	.313	.750	.000	.723	.808	.931	.559	.000	.931	.705	.750	.681	.000	.741	.937
Cars	25	804	72	1	902	47	5	54	0	106	97	907	38	0	1042	31	3	49	0	83	2133
% Cars	100	99.9	100	100	99.9	97.9	100	100	0	99.1	100	99.5	100	0	99.5	100	100	100	0	100	99.7
Trucks	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	3
% Trucks	0	0	0	0	0	2.1	0	0	0	0.9	0	0.2	0	0	0.2	0	0	0	0	0	0.1
Peds	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
% Peds	0	0.1	0	0	0.1	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.2

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27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- Trans X 7-9 AM
Site Code : 00000000
Start Date : 3/1/2018
Page No : 1

Groups Printed- Cars - Trucks - Peds

	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	133	4	1	138	0	0	2	0	2	4	177	0	0	181	0	0	0	0	0	321
07:15 AM	0	145	6	0	151	2	0	1	0	3	4	214	0	0	218	0	0	0	0	0	372
07:30 AM	0	159	2	0	161	0	0	2	0	2	2	189	0	0	191	0	0	0	0	0	354
07:45 AM	0	159	10	0	169	1	0	2	0	3	8	204	0	0	212	0	0	0	0	0	384
Total	0	596	22	1	619	3	0	7	0	10	18	784	0	0	802	0	0	0	0	0	1431
08:00 AM	0	131	2	0	133	1	0	5	0	6	9	211	0	0	220	0	0	0	0	0	359
08:15 AM	0	122	2	0	124	2	0	1	0	3	5	210	0	0	215	0	0	0	0	0	342
08:30 AM	0	131	6	0	137	2	0	3	0	5	6	193	0	0	199	0	0	0	0	0	341
08:45 AM	0	129	2	0	131	4	0	4	0	8	10	195	0	0	205	0	0	0	0	0	344
Total	0	513	12	0	525	9	0	13	0	22	30	809	0	0	839	0	0	0	0	0	1386
Grand Total	0	1109	34	1	1144	12	0	20	0	32	48	1593	0	0	1641	0	0	0	0	0	2817
Apprch %	0	96.9	3	0.1		37.5	0	62.5	0		2.9	97.1	0	0		0	0	0	0		
Total %	0	39.4	1.2	0	40.6	0.4	0	0.7	0	1.1	1.7	56.5	0	0	58.3	0	0	0	0	0	
Cars	0	1084	32	1	1117	12	0	20	0	32	48	1537	0	0	1585	0	0	0	0	0	2734
% Cars	0	97.7	94.1	100	97.6	100	0	100	0	100	100	96.5	0	0	96.6	0	0	0	0	0	97.1
Trucks	0	14	0	0	14	0	0	0	0	0	0	27	0	0	27	0	0	0	0	0	41
% Trucks	0	1.3	0	0	1.2	0	0	0	0	0	0	1.7	0	0	1.6	0	0	0	0	0	1.5
Peds	0	11	2	0	13	0	0	0	0	0	0	29	0	0	29	0	0	0	0	0	42
% Peds	0	1	5.9	0	1.1	0	0	0	0	0	0	1.8	0	0	1.8	0	0	0	0	0	1.5

File Name : Novi Rd- Trans X 7-9 AM
Site Code : 00000000
Start Date : 3/1/2018
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	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	145	6	0	151	**2**	0	1	0	3	4	**214**	0	0	218	0	0	0	0	0	372
07:30 AM	0	**159**	2	0	161	0	0	2	0	2	2	189	0	0	191	0	0	0	0	0	354
07:45 AM	0	159	**10**	0	**169**	1	0	2	0	3	8	204	0	0	212	0	0	0	0	0	**384**
08:00 AM	0	131	2	0	133	1	0	**5**	0	**6**	**9**	211	0	0	**220**	0	0	0	0	0	359
Total Volume	0	594	20	0	614	4	0	10	0	14	23	818	0	0	841	0	0	0	0	0	1469
% App. Total	0	96.7	3.3	0		28.6	0	71.4	0		2.7	97.3	0	0		0	0	0	0		
PHF	.000	.934	.500	.000	.908	.500	.000	.500	.000	.583	.639	.956	.000	.000	.956	.000	.000	.000	.000	.000	.956
Cars	0	581	20	0	601	4	0	10	0	14	23	783	0	0	806	0	0	0	0	0	1421
% Cars	0	97.8	100	0	97.9	100	0	100	0	100	100	95.7	0	0	95.8	0	0	0	0	0	96.7
Trucks	0	8	0	0	8	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	25
% Trucks	0	1.3	0	0	1.3	0	0	0	0	0	0	2.1	0	0	2.0	0	0	0	0	0	1.7
Peds	0	5	0	0	5	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	23
% Peds	0	0.8	0	0	0.8	0	0	0	0	0	0	2.2	0	0	2.1	0	0	0	0	0	1.6

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27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- Tran X 4-6 PM
Site Code : 00000000
Start Date : 2/28/2018
Page No : 1

Groups Printed- Cars - Trucks - Peds

	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	198	3	1	202	13	0	5	0	18	5	247	0	0	252	0	0	0	0	0	472
04:15 PM	0	232	0	0	232	5	0	3	0	8	5	224	0	1	230	0	0	0	0	0	470
04:30 PM	0	206	1	0	207	3	0	2	0	5	7	222	0	0	229	0	0	0	0	0	441
04:45 PM	0	250	1	1	252	3	0	6	0	9	5	256	0	0	261	0	0	0	0	0	522
Total	0	886	5	2	893	24	0	16	0	40	22	949	0	1	972	0	0	0	0	0	1905
05:00 PM	0	247	1	0	248	6	0	4	0	10	6	281	0	0	287	0	0	0	0	0	545
05:15 PM	0	247	0	0	247	2	0	4	0	6	3	233	0	0	236	0	0	0	0	0	489
05:30 PM	0	256	1	0	257	2	0	8	0	10	7	253	0	0	260	0	0	0	0	0	527
05:45 PM	0	239	1	0	240	2	0	3	0	5	4	231	0	0	235	0	0	0	0	0	480
Total	0	989	3	0	992	12	0	19	0	31	20	998	0	0	1018	0	0	0	0	0	2041
Grand Total	0	1875	8	2	1885	36	0	35	0	71	42	1947	0	1	1990	0	0	0	0	0	3946
Apprch %	0	99.5	0.4	0.1		50.7	0	49.3	0		2.1	97.8	0	0.1		0	0	0	0		
Total %	0	47.5	0.2	0.1	47.8	0.9	0	0.9	0	1.8	1.1	49.3	0	0	50.4	0	0	0	0	0	
Cars	0	1844	7	2	1853	34	0	33	0	67	40	1918	0	1	1959	0	0	0	0	0	3879
% Cars	0	98.3	87.5	100	98.3	94.4	0	94.3	0	94.4	95.2	98.5	0	100	98.4	0	0	0	0	0	98.3
Trucks	0	15	0	0	15	2	0	1	0	3	2	13	0	0	15	0	0	0	0	0	33
% Trucks	0	0.8	0	0	0.8	5.6	0	2.9	0	4.2	4.8	0.7	0	0	0.8	0	0	0	0	0	0.8
Peds	0	16	1	0	17	0	0	1	0	1	0	16	0	0	16	0	0	0	0	0	34
% Peds	0	0.9	12.5	0	0.9	0	0	2.9	0	1.4	0	0.8	0	0	0.8	0	0	0	0	0	0.9

File Name : Novi Rd- Tran X 4-6 PM
Site Code : 00000000
Start Date : 2/28/2018
Page No : 2

	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	250	**1**	**1**	252	3	0	6	0	9	5	256	0	0	261	0	0	0	0	0	522
05:00 PM	0	247	1	0	248	**6**	0	4	0	**10**	6	**281**	0	0	**287**	0	0	0	0	0	**545**
05:15 PM	0	247	0	0	247	2	0	4	0	6	3	233	0	0	236	0	0	0	0	0	489
05:30 PM	0	**256**	1	0	**257**	2	0	**8**	0	10	**7**	253	0	0	260	0	0	0	0	0	527
Total Volume	0	1000	3	1	1004	13	0	22	0	35	21	1023	0	0	1044	0	0	0	0	0	2083
% App. Total	0	99.6	0.3	0.1		37.1	0	62.9	0		2	98	0	0		0	0	0	0		
PHF	.000	.977	.750	.250	.977	.542	.000	.688	.000	.875	.750	.910	.000	.000	.909	.000	.000	.000	.000	.000	.956
Cars	0	986	3	1	990	13	0	20	0	33	21	1013	0	0	1034	0	0	0	0	0	2057
% Cars	0	98.6	100	100	98.6	100	0	90.9	0	94.3	100	99.0	0	0	99.0	0	0	0	0	0	98.8
Trucks	0	8	0	0	8	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	12
% Trucks	0	0.8	0	0	0.8	0	0	4.5	0	2.9	0	0.3	0	0	0.3	0	0	0	0	0	0.6
Peds	0	6	0	0	6	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	14
% Peds	0	0.6	0	0	0.6	0	0	4.5	0	2.9	0	0.7	0	0	0.7	0	0	0	0	0	0.7

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- Trans X 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	0	213	1	0	214	0	0	4	1	5	6	285	0	0	291	0	0	0	0	0	510
01:15 PM	0	225	1	0	226	0	0	2	0	2	1	260	0	0	261	0	0	0	0	0	489
01:30 PM	0	227	0	0	227	1	0	7	0	8	1	272	0	0	273	0	0	0	0	0	508
01:45 PM	0	212	0	0	212	0	0	4	0	4	6	224	0	0	230	0	0	0	0	0	446
Total	0	877	2	0	879	1	0	17	1	19	14	1041	0	0	1055	0	0	0	0	0	1953
02:00 PM	0	229	2	0	231	0	0	3	0	3	3	229	0	0	232	0	0	0	0	0	466
02:15 PM	0	211	1	1	213	2	0	6	0	8	4	218	1	0	223	0	0	0	0	0	444
02:30 PM	0	250	0	1	251	1	0	2	0	3	2	239	0	1	242	0	0	0	0	0	496
02:45 PM	0	221	3	0	224	0	0	2	0	2	2	212	0	3	217	0	0	0	0	0	443
Total	0	911	6	2	919	3	0	13	0	16	11	898	1	4	914	0	0	0	0	0	1849
Grand Total	0	1788	8	2	1798	4	0	30	1	35	25	1939	1	4	1969	0	0	0	0	0	3802
Apprch %	0	99.4	0.4	0.1		11.4	0	85.7	2.9		1.3	98.5	0.1	0.2		0	0	0	0		
Total %	0	47	0.2	0.1	47.3	0.1	0	0.8	0	0.9	0.7	51	0	0.1	51.8	0	0	0	0	0	
Cars	0	1781	7	2	1790	4	0	30	1	35	25	1927	1	4	1957	0	0	0	0	0	3782
% Cars	0	99.6	87.5	100	99.6	100	0	100	100	100	100	99.4	100	100	99.4	0	0	0	0	0	99.5
Trucks	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
% Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.2
Pedestrians	0	6	1	0	7	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	14
% Pedestrians	0	0.3	12.5	0	0.4	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.4

File Name : Novi Rd- Trans X 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 2

	NOVI From North					TRANS X From East					NOVI From South					TRANS X From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	0	213	**1**	0	214	0	0	4	**1**	5	**6**	**285**	0	0	**291**	0	0	0	0	0	**510**
01:15 PM	0	225	1	0	226	0	0	2	0	2	1	260	0	0	261	0	0	0	0	0	489
01:30 PM	0	**227**	0	0	**227**	**1**	0	**7**	0	**8**	1	272	0	0	273	0	0	0	0	0	508
01:45 PM	0	212	0	0	212	0	0	4	0	4	6	224	0	0	230	0	0	0	0	0	446
Total Volume	0	877	2	0	879	1	0	17	1	19	14	1041	0	0	1055	0	0	0	0	0	1953
% App. Total	0	99.8	0.2	0		5.3	0	89.5	5.3		1.3	98.7	0	0		0	0	0	0		
PHF	.000	.966	.500	.000	.968	.250	.000	.607	.250	.594	.583	.913	.000	.000	.906	.000	.000	.000	.000	.000	.957
Cars	0	874	2	0	876	1	0	17	1	19	14	1032	0	0	1046	0	0	0	0	0	1941
% Cars	0	99.7	100	0	99.7	100	0	100	100	100	100	99.1	0	0	99.1	0	0	0	0	0	99.4
Trucks	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
% Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	0.3
Pedestrians	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
% Pedestrians	0	0.2	0	0	0.2	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0.3

AECOM
2777 Franklin Road, Suite 2000
Southfield, MI 48034

File Name : Novi Rd- Post Office 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	NOVI From North				POST OFFICE From East				NOVI From South				POST OFFICE From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:00 PM	19	205	4	0	0	0	0	1	1	262	17	0	19	0	8	0	536
01:15 PM	10	214	0	0	0	0	0	0	0	246	9	0	11	0	10	0	500
01:30 PM	11	213	2	0	1	0	0	0	0	240	22	0	13	0	14	0	516
01:45 PM	12	209	1	0	0	0	0	0	0	230	11	0	19	0	10	0	492
Total	52	841	7	0	1	0	0	1	1	978	59	0	62	0	42	0	2044
02:00 PM	11	197	0	0	0	0	0	0	0	214	10	0	7	0	8	0	447
02:15 PM	10	184	1	0	1	9	4	0	1	192	18	0	13	30	20	0	483
02:30 PM	10	220	1	0	1	0	1	0	0	219	9	0	14	0	13	0	488
02:45 PM	11	235	1	0	1	0	0	0	0	207	11	2	18	0	8	0	494
Total	42	836	3	0	3	9	5	0	1	832	48	2	52	30	49	0	1912
Grand Total	94	1677	10	0	4	9	5	1	2	1810	107	2	114	30	91	0	3956
Apprch %	5.3	94.2	0.6	0	21.1	47.4	26.3	5.3	0.1	94.2	5.6	0.1	48.5	12.8	38.7	0	
Total %	2.4	42.4	0.3	0	0.1	0.2	0.1	0	0.1	45.8	2.7	0.1	2.9	0.8	2.3	0	
Cars	94	1670	10	0	4	9	4	1	1	1806	106	2	113	30	91	0	3941
% Cars	100	99.6	100	0	100	100	80	100	50	99.8	99.1	100	99.1	100	100	0	99.6
Trucks	0	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	5
% Trucks	0	0.2	0	0	0	0	0	0	0	0	0.9	0	0.9	0	0	0	0.1
Pedestrians	0	4	0	0	0	0	1	0	1	4	0	0	0	0	0	0	10
% Pedestrians	0	0.2	0	0	0	0	20	0	50	0.2	0	0	0	0	0	0	0.3

File Name : Novi Rd- Post Office 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 2

	NOVI From North					POST OFFICE From East					NOVI From South					POST OFFICE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	**19**	205	**4**	0	**228**	0	0	0	**1**	**1**	**1**	**262**	17	0	**280**	**19**	0	8	0	27	**536**
01:15 PM	10	**214**	0	0	224	0	0	0	0	0	0	246	9	0	255	11	0	10	0	21	500
01:30 PM	11	213	2	0	226	**1**	0	0	0	1	0	240	**22**	0	262	13	0	**14**	0	27	516
01:45 PM	12	209	1	0	222	0	0	0	0	0	0	230	11	0	241	19	0	10	0	**29**	492
Total Volume	52	841	7	0	900	1	0	0	1	2	1	978	59	0	1038	62	0	42	0	104	2044
% App. Total	5.8	93.4	0.8	0		50	0	0	50		0.1	94.2	5.7	0		59.6	0	40.4	0		
PHF	.684	.982	.438	.000	.987	.250	.000	.000	.250	.500	.250	.933	.670	.000	.927	.816	.000	.750	.000	.897	.953
Cars	52	835	7	0	894	1	0	0	1	2	1	975	58	0	1034	61	0	42	0	103	2033
% Cars	100	99.3	100	0	99.3	100	0	0	100	100	100	99.7	98.3	0	99.6	98.4	0	100	0	99.0	99.5
Trucks	0	3	0	0	3	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	5
% Trucks	0	0.4	0	0	0.3	0	0	0	0	0	0	0	1.7	0	0.1	1.6	0	0	0	1.0	0.2
Pedestrians	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
% Pedestrians	0	0.4	0	0	0.3	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.3

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- 10 Mile Rd 7-9 AM & 4-6 PM
Site Code : 00000000
Start Date : 3/7/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	NOVI RD From North					10 MILE RD From East					NOVI RD From South					10 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	61	111	34	1	207	40	143	35	0	218	19	142	39	0	200	43	75	42	0	160	785
04:15 PM	72	160	27	0	259	37	146	37	0	220	20	117	43	0	180	50	80	40	0	170	829
04:30 PM	67	150	33	0	250	43	142	49	0	234	16	160	51	0	227	39	82	48	0	169	880
04:45 PM	64	157	25	0	246	42	138	39	0	219	18	144	47	0	209	29	90	53	0	172	846
Total	264	578	119	1	962	162	569	160	0	891	73	563	180	0	816	161	327	183	0	671	3340
05:00 PM	72	178	34	0	284	42	143	44	0	229	23	169	43	0	235	64	88	43	0	195	943
05:15 PM	56	170	25	1	252	30	145	51	3	229	23	173	54	0	250	58	70	41	0	169	900
05:30 PM	75	169	33	0	277	40	147	66	0	253	16	148	62	0	226	49	71	51	0	171	927
05:45 PM	77	160	28	0	265	39	130	62	0	231	19	135	47	0	201	47	68	47	0	162	859
Total	280	677	120	1	1078	151	565	223	3	942	81	625	206	0	912	218	297	182	0	697	3629
*** BREAK ***																					
07:00 AM	45	58	15	0	118	11	81	10	1	103	17	110	42	0	169	40	122	81	0	243	633
07:15 AM	11	102	15	0	128	17	50	14	0	81	30	98	28	0	156	42	129	90	0	261	626
07:30 AM	23	104	23	0	150	14	53	16	0	83	36	138	29	0	203	37	112	62	0	211	647
07:45 AM	22	94	25	0	141	30	61	17	0	108	39	145	33	0	217	45	148	84	0	277	743
Total	101	358	78	0	537	72	245	57	1	375	122	491	132	0	745	164	511	317	0	992	2649
08:00 AM	18	89	24	0	131	22	57	18	0	97	40	110	22	0	172	49	148	70	0	267	667
08:15 AM	22	75	18	0	115	27	45	28	0	100	48	120	36	1	205	38	103	77	2	220	640
08:30 AM	34	77	17	0	128	18	55	10	0	83	23	126	29	0	178	49	91	66	0	206	595
08:45 AM	13	85	28	0	126	14	52	23	0	89	27	115	30	0	172	49	124	67	0	240	627
Total	87	326	87	0	500	81	209	79	0	369	138	471	117	1	727	185	466	280	2	933	2529
Grand Total	732	1939	404	2	3077	466	1588	519	4	2577	414	2150	635	1	3200	728	1601	962	2	3293	12147
Apprch %	23.8	63	13.1	0.1		18.1	61.6	20.1	0.2		12.9	67.2	19.8	0		22.1	48.6	29.2	0.1		
Total %	6	16	3.3	0	25.3	3.8	13.1	4.3	0	21.2	3.4	17.7	5.2	0	26.3	6	13.2	7.9	0	27.1	
Cars	721	1900	398	2	3021	448	1564	514	4	2530	410	2109	628	1	3148	711	1575	955	2	3243	11942
% Cars	98.5	98	98.5	100	98.2	96.1	98.5	99	100	98.2	99	98.1	98.9	100	98.4	97.7	98.4	99.3	100	98.5	98.3
Trucks	10	23	5	0	38	12	21	5	0	38	3	30	7	0	40	16	21	6	0	43	159
% Trucks	1.4	1.2	1.2	0	1.2	2.6	1.3	1	0	1.5	0.7	1.4	1.1	0	1.2	2.2	1.3	0.6	0	1.3	1.3
Pedestrians	1	16	1	0	18	6	3	0	0	9	1	11	0	0	12	1	5	1	0	7	46
% Pedestrians	0.1	0.8	0.2	0	0.6	1.3	0.2	0	0	0.3	0.2	0.5	0	0	0.4	0.1	0.3	0.1	0	0.2	0.4

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Novi Rd- 10 Mile Rd 7-9 AM & 4-6 PM
Site Code : 00000000
Start Date : 3/7/2018
Page No : 2

	NOVI RD From North					10 MILE RD From East					NOVI RD From South					10 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	72	**178**	**34**	0	**284**	**42**	143	44	0	229	**23**	169	43	0	235	**64**	**88**	43	0	**195**	**943**
05:15 PM	56	170	25	**1**	252	30	145	51	**3**	229	23	**173**	54	0	**250**	58	70	41	0	169	900
05:30 PM	75	169	33	0	277	40	**147**	**66**	0	**253**	16	148	**62**	0	226	49	71	**51**	0	171	927
05:45 PM	**77**	160	28	0	265	39	130	62	0	231	19	135	47	0	201	47	68	47	0	162	859
Total Volume	280	677	120	1	1078	151	565	223	3	942	81	625	206	0	912	218	297	182	0	697	3629
% App. Total	26	62.8	11.1	0.1		16	60	23.7	0.3		8.9	68.5	22.6	0		31.3	42.6	26.1	0		
PHF	.909	.951	.882	.250	.949	.899	.961	.845	.250	.931	.880	.903	.831	.000	.912	.852	.844	.892	.000	.894	.962
Cars	279	671	119	1	1070	151	563	222	3	939	79	620	206	0	905	216	295	180	0	691	3605
% Cars	99.6	99.1	99.2	100	99.3	100	99.6	99.6	100	99.7	97.5	99.2	100	0	99.2	99.1	99.3	98.9	0	99.1	99.3
Trucks	1	2	1	0	4	0	1	1	0	2	2	5	0	0	7	2	1	1	0	4	17
% Trucks	0.4	0.3	0.8	0	0.4	0	0.2	0.4	0	0.2	2.5	0.8	0	0	0.8	0.9	0.3	0.5	0	0.6	0.5
Pedestrians	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	7
% Pedestrians	0	0.6	0	0	0.4	0	0.2	0	0	0.1	0	0	0	0	0	0	0.3	0.5	0	0.3	0.2

File Name : Novi Rd- 10 Mile Rd 7-9 AM & 4-6 PM
Site Code : 00000000
Start Date : 3/7/2018
Page No : 3

	NOVI RD From North					10 MILE RD From East					NOVI RD From South					10 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**23**	**104**	23	0	**150**	14	53	16	0	83	36	138	29	0	203	37	112	62	0	211	647
07:45 AM	22	94	**25**	0	141	**30**	**61**	17	0	**108**	39	**145**	33	0	**217**	45	**148**	**84**	0	**277**	**743**
08:00 AM	18	89	24	0	131	22	57	18	0	97	40	110	22	0	172	**49**	148	70	0	267	667
08:15 AM	22	75	18	0	115	27	45	**28**	0	100	**48**	120	**36**	**1**	205	38	103	77	**2**	220	640
Total Volume	85	362	90	0	537	93	216	79	0	388	163	513	120	1	797	169	511	293	2	975	2697
% App. Total	15.8	67.4	16.8	0		24	55.7	20.4	0		20.5	64.4	15.1	0.1		17.3	52.4	30.1	0.2		
PHF	.924	.870	.900	.000	.895	.775	.885	.705	.000	.898	.849	.884	.833	.250	.918	.862	.863	.872	.250	.880	.907
Cars	83	353	88	0	524	81	206	75	0	362	162	497	116	1	776	163	499	291	2	955	2617
% Cars	97.6	97.5	97.8	0	97.6	87.1	95.4	94.9	0	93.3	99.4	96.9	96.7	100	97.4	96.4	97.7	99.3	100	97.9	97.0
Trucks	1	7	1	0	9	6	9	4	0	19	0	12	4	0	16	6	10	2	0	18	62
% Trucks	1.2	1.9	1.1	0	1.7	6.5	4.2	5.1	0	4.9	0	2.3	3.3	0	2.0	3.6	2.0	0.7	0	1.8	2.3
Pedestrians	1	2	1	0	4	6	1	0	0	7	1	4	0	0	5	0	2	0	0	2	18
% Pedestrians	1.2	0.6	1.1	0	0.7	6.5	0.5	0	0	1.8	0.6	0.8	0	0	0.6	0	0.4	0	0	0.2	0.7

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ 10 Mile Rd (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Data

Start Time	10 Mile Rd Eastbound					10 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	60	69	25	0	154	27	75	38	0	140	50	137	22	0	209	27	124	68	0	219	722
1:15 PM	55	77	36	0	168	17	59	45	0	121	30	138	26	0	194	28	110	58	0	196	679
1:30 PM	51	69	15	0	135	34	67	31	0	132	41	123	23	0	187	38	134	74	0	246	700
1:45 PM	53	58	24	0	135	21	80	33	0	134	25	118	18	0	161	34	130	55	0	219	649
Hourly Total	219	273	100	0	592	99	281	147	0	527	146	516	89	0	751	127	498	255	0	880	2750
2:00 PM	55	67	15	0	137	11	77	30	0	118	26	132	16	0	174	29	89	57	0	175	604
2:15 PM	65	63	24	0	152	20	80	20	1	120	38	98	24	0	160	29	101	50	0	180	612
2:30 PM	56	74	26	0	156	20	64	29	0	113	27	112	18	0	157	18	128	58	0	204	630
2:45 PM	51	59	44	0	154	29	90	21	0	140	23	113	19	0	155	41	122	55	0	218	667
Hourly Total	227	263	109	0	599	80	311	100	1	491	114	455	77	0	646	117	440	220	0	777	2513
Grand Total	446	536	209	0	1191	179	592	247	1	1018	260	971	166	0	1397	244	938	475	0	1657	5263
Approach %	37.4	45.0	17.5	-	-	17.6	58.2	24.3	-	-	18.6	69.5	11.9	-	-	14.7	56.6	28.7	-	-	-
Total %	8.5	10.2	4.0	-	22.6	3.4	11.2	4.7	-	19.3	4.9	18.4	3.2	-	26.5	4.6	17.8	9.0	-	31.5	-
Lights	443	535	207	-	1185	179	589	247	-	1015	258	965	166	-	1389	242	937	474	-	1653	5242
% Lights	99.3	99.8	99.0	-	99.5	100.0	99.5	100.0	-	99.7	99.2	99.4	100.0	-	99.4	99.2	99.9	99.8	-	99.8	99.6
Other Vehicles	3	1	2	-	6	0	3	0	-	3	2	6	0	-	8	2	1	1	-	4	21
% Other Vehicles	0.7	0.2	1.0	-	0.5	0.0	0.5	0.0	-	0.3	0.8	0.6	0.0	-	0.6	0.8	0.1	0.2	-	0.2	0.4
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Novi Rd @ 10 Mile Rd (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Peak Hour Data (1:00 PM)

Start Time	10 Mile Rd Eastbound					10 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	60	69	25	0	154	27	75	38	0	140	50	137	22	0	209	27	124	68	0	219	722
1:15 PM	55	77	36	0	168	17	59	45	0	121	30	138	26	0	194	28	110	58	0	196	679
1:30 PM	51	69	15	0	135	34	67	31	0	132	41	123	23	0	187	38	134	74	0	246	700
1:45 PM	53	58	24	0	135	21	80	33	0	134	25	118	18	0	161	34	130	55	0	219	649
Total	219	273	100	0	592	99	281	147	0	527	146	516	89	0	751	127	498	255	0	880	2750
Approach %	37.0	46.1	16.9	-	-	18.8	53.3	27.9	-	-	19.4	68.7	11.9	-	-	14.4	56.6	29.0	-	-	-
Total %	8.0	9.9	3.6	-	21.5	3.6	10.2	5.3	-	19.2	5.3	18.8	3.2	-	27.3	4.6	18.1	9.3	-	32.0	-
PHF	0.913	0.886	0.694	-	0.881	0.728	0.878	0.817	-	0.941	0.730	0.935	0.856	-	0.898	0.836	0.929	0.861	-	0.894	0.952
Lights	218	272	100	-	590	99	280	147	-	526	144	514	89	-	747	126	497	254	-	877	2740
% Lights	99.5	99.6	100.0	-	99.7	100.0	99.6	100.0	-	99.8	98.6	99.6	100.0	-	99.5	99.2	99.8	99.6	-	99.7	99.6
Other Vehicles	1	1	0	-	2	0	1	0	-	1	2	2	0	-	4	1	1	1	-	3	10
% Other Vehicles	0.5	0.4	0.0	-	0.3	0.0	0.4	0.0	-	0.2	1.4	0.4	0.0	-	0.5	0.8	0.2	0.4	-	0.3	0.4
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM
3950 Sparks Dr SE
Grand Rapids, MI 49546
616-574-8500

File Name : Grand River @ Comau AM
Site Code : 00000001
Start Date : 10/4/2018
Page No : 1

Groups Printed- Unshifted - Bank 1

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	1	0	1	0	105	11	0	116	0	0	0	0	0	2	226	0	0	228	345
07:15 AM	1	0	1	0	2	0	137	9	0	146	1	0	1	0	2	0	279	1	0	280	430
07:30 AM	0	0	1	0	1	0	150	4	1	155	0	0	1	0	1	2	293	0	0	295	452
07:45 AM	1	0	0	0	1	1	157	4	0	162	0	0	0	0	0	0	355	0	0	355	518
Total	2	0	3	0	5	1	549	28	1	579	1	0	2	0	3	4	1153	1	0	1158	1745
08:00 AM	4	0	0	0	4	0	149	6	0	155	0	0	0	0	0	1	291	0	0	292	451
08:15 AM	2	0	0	0	2	0	140	0	0	140	0	0	2	0	2	2	296	0	0	298	442
08:30 AM	0	0	0	0	0	1	138	4	0	143	0	0	2	0	2	1	249	2	0	252	397
08:45 AM	0	0	1	0	1	2	170	4	0	176	0	0	3	0	3	0	268	1	2	271	451
Total	6	0	1	0	7	3	597	14	0	614	0	0	7	0	7	4	1104	3	2	1113	1741
Grand Total	8	0	4	0	12	4	1146	42	1	1193	1	0	9	0	10	8	2257	4	2	2271	3486
Apprch %	66.7	0	33.3	0		0.3	96.1	3.5	0.1		10	0	90	0		0.4	99.4	0.2	0.1		
Total %	0.2	0	0.1	0	0.3	0.1	32.9	1.2	0	34.2	0	0	0.3	0	0.3	0.2	64.7	0.1	0.1	65.1	
Unshifted	4	0	3	0	7	4	1105										2179				
% Unshifted	50	0	75	0	58.3	100	96.4	92.9	100	96.3	100	0	100	0	100	100	96.5	100	100	96.6	96.4
Bank 1	4	0	1	0	5	0	41	3	0	44	0	0	0	0	0	0	78	0	0	78	127
% Bank 1	50	0	25	0	41.7	0	3.6	7.1	0	3.7	0	0	0	0	0	0	3.5	0	0	3.4	3.6

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	**1**	0	1	0	150	4	**1**	155	0	0	1	0	1	**2**	293	0	0	295	452
07:45 AM	1	0	0	0	1	**1**	**157**	4	0	**162**	0	0	0	0	0	0	**355**	0	0	**355**	**518**
08:00 AM	**4**	0	0	0	**4**	0	149	**6**	0	155	0	0	0	0	0	1	291	0	0	292	451
08:15 AM	2	0	0	0	2	0	140	0	0	140	0	0	**2**	0	**2**	2	296	0	0	298	442
Total Volume	7	0	1	0	8	1	596	14	1	612	0	0	3	0	3	5	1235	0	0	1240	1863
% App. Total	87.5	0	12.5	0		0.2	97.4	2.3	0.2		0	0	100	0		0.4	99.6	0	0		
PHF	.438	.000	.250	.000	.500	.250	.949	.583	.250	.944	.000	.000	.375	.000	.375	.625	.870	.000	.000	.873	.899
Unshifted	4	0	1	0	5	1	580	14	1	596	0	0	3	0	3	5	1188				
% Unshifted	57.1	0	100	0	62.5	100	97.3	100	100	97.4	0	0	100	0	100	100	96.2	0	0	96.2	96.5
Bank 1	3	0	0	0	3	0	16	0	0	16	0	0	0	0	0	0	47	0	0	47	66
% Bank 1	42.9	0	0	0	37.5	0	2.7	0	0	2.6	0	0	0	0	0	0	3.8	0	0	3.8	3.5

AECOM
3950 Sparks Dr SE
Grand Rapids, MI 49546
616-574-8500

File Name : Grand River @ Comau PM
Site Code : 00000002
Start Date : 10/4/2018
Page No : 1

Groups Printed- Unshifted - Bank 1

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:45 PM	8	0	8	0	16	1	266	4	0	271	0	0	0	0	0	1	224	0	0	225	512
Total	8	0	8	0	16	1	266	4	0	271	0	0	0	0	0	1	224	0	0	225	512
04:00 PM	25	0	8	0	33	3	313	2	0	318	0	0	0	0	0	1	225	1	0	227	578
04:15 PM	37	0	11	0	48	0	333	2	0	335	0	0	1	0	1	0	195	2	0	197	581
04:30 PM	3	0	4	1	8	4	342	0	0	346	2	0	3	0	5	0	211	0	0	211	570
04:45 PM	3	0	0	0	3	1	384	0	0	385	0	0	1	0	1	0	217	0	0	217	606
Total	68	0	23	1	92	8	1372	4	0	1384	2	0	5	0	7	1	848	3	0	852	2335
05:00 PM	1	0	2	0	3	2	333	0	0	335	1	0	0	0	1	1	238	0	0	239	578
05:15 PM	4	0	1	0	5	1	330	0	0	331	0	0	2	0	2	0	213	1	0	214	552
05:30 PM	1	0	0	0	1	0	359	0	0	359	1	0	3	1	5	0	201	2	0	203	568
Grand Total	82	0	34	1	117	12	2660	8	0	2680	4	0	10	1	15	3	1724	6	0	1733	4545
Apprch %	70.1	0	29.1	0.9		0.4	99.3	0.3	0		26.7	0	66.7	6.7		0.2	99.5	0.3	0		
Total %	1.8	0	0.7	0	2.6	0.3	58.5	0.2	0	59	0.1	0	0.2	0	0.3	0.1	37.9	0.1	0	38.1	
Unshifted	82	0	34	1	117	12	2602										1700				
% Unshifted	100	0	100	100	100	100	97.8	100	0	97.8	100	0	100	100	100	100	98.6	100	0	98.6	98.2
Bank 1	0	0	0	0	0	0	58	0	0	58	0	0	0	0	0	0	24	0	0	24	82
% Bank 1	0	0	0	0	0	0	2.2	0	0	2.2	0	0	0	0	0	0	1.4	0	0	1.4	1.8

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	25	0	8	0	33	3	313	**2**	0	318	0	0	0	0	0	**1**	**225**	1	0	**227**	578
04:15 PM	**37**	0	**11**	0	**48**	0	333	2	0	335	0	0	1	0	1	0	195	**2**	0	197	581
04:30 PM	3	0	4	**1**	8	**4**	342	0	0	346	**2**	0	**3**	0	**5**	0	211	0	0	211	570
04:45 PM	3	0	0	0	3	1	**384**	0	0	**385**	0	0	1	0	1	0	217	0	0	217	**606**
Total Volume	68	0	23	1	92	8	1372	4	0	1384	2	0	5	0	7	1	848	3	0	852	2335
% App. Total	73.9	0	25	1.1		0.6	99.1	0.3	0		28.6	0	71.4	0		0.1	99.5	0.4	0		
PHF	.459	.000	.523	.250	.479	.500	.893	.500	.000	.899	.250	.000	.417	.000	.350	.250	.942	.375	.000	.938	.963
Unshifted	68	0	23	1	92	8	1335														
% Unshifted	100	0	100	100	100	100	97.3	100	0	97.3	100	0	100	0	100	100	98.7	100	0	98.7	97.9
Bank 1	0	0	0	0	0	0	37	0	0	37	0	0	0	0	0	0	11	0	0	11	48
% Bank 1	0	0	0	0	0	0	2.7	0	0	2.7	0	0	0	0	0	0	1.3	0	0	1.3	2.1

AECOM
3950 Sparks Dr SE
Grand Rapids, MI 49546
616-574-8500

File Name : Grand River @ Comau (Sat)
Site Code : 00000011
Start Date : 10/6/2018
Page No : 1

Groups Printed- Unshifted - Bank 1

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
01:00 PM	1	0	1	0	2	0	221	4	0	225	0	0	0	0	0	0	228	0	0	228	455
01:15 PM	0	0	2	0	2	0	215	2	0	217	0	0	0	0	0	1	261	0	0	262	481
01:30 PM	3	0	1	0	4	0	186	1	0	187	0	0	0	0	0	2	265	0	0	267	458
01:45 PM	1	0	0	0	1	0	199	3	0	202	0	0	0	0	0	0	231	0	0	231	434
Total	5	0	4	0	9	0	821	10	0	831	0	0	0	0	0	3	985	0	0	988	1828
02:00 PM	1	0	1	0	2	0	251	2	0	253	0	0	0	0	0	0	224	0	0	224	479
02:15 PM	6	0	3	0	9	0	235	2	0	237	0	0	0	0	0	1	94	92	0	187	433
02:30 PM	12	0	8	0	20	1	202	2	0	205	0	0	0	0	0	0	254	0	0	254	479
02:45 PM	7	0	3	0	10	0	219	1	0	220	0	0	0	0	0	0	292	0	0	292	522
Total	26	0	15	0	41	1	907	7	0	915	0	0	0	0	0	1	864	92	0	957	1913
Grand Total	31	0	19	0	50	1	1728	17	0	1746	0	0	0	0	0	4	1849	92	0	1945	3741
Apprch %	62	0	38	0		0.1	99	1	0		0	0	0	0		0.2	95.1	4.7	0		
Total %	0.8	0	0.5	0	1.3	0	46.2	0.5	0	46.7	0	0	0	0	0	0.1	49.4	2.5	0	52	
Unshifted	30	0	19	0	49	1	1715										1846				
% Unshifted	96.8	0	100	0	98	100	99.2	100	0	99.3	0	0	0	0	0	100	99.8	100	0	99.8	99.5
Bank 1	1	0	0	0	1	0	13	0	0	13	0	0	0	0	0	0	3	0	0	3	17
% Bank 1	3.2	0	0	0	2	0	0.8	0	0	0.7	0	0	0	0	0	0	0.2	0	0	0.2	0.5

	Comau Industrial Dr Southbound					Grand River Ave Westbound					Comau Industrial Dr Northbound					Grand River Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	1	0	1	0	2	0	**251**	**2**	0	**253**	0	0	0	0	0	0	224	0	0	224	479
02:15 PM	6	0	3	0	9	0	235	2	0	237	0	0	0	0	0	**1**	94	**92**	0	187	433
02:30 PM	**12**	0	**8**	0	**20**	**1**	202	2	0	205	0	0	0	0	0	0	254	0	0	254	479
02:45 PM	7	0	3	0	10	0	219	1	0	220	0	0	0	0	0	0	**292**	0	0	**292**	**522**
Total Volume	26	0	15	0	41	1	907	7	0	915	0	0	0	0	0	1	864	92	0	957	1913
% App. Total	63.4	0	36.6	0		0.1	99.1	0.8	0		0	0	0	0		0.1	90.3	9.6	0		
PHF	.542	.000	.469	.000	.513	.250	.903	.875	.000	.904	.000	.000	.000	.000	.000	.250	.740	.250	.000	.819	.916
Unshifted	26	0	15	0	41	1	904	7	0	912	0	0	0	0	0	1	864	92	0	957	1910
% Unshifted							99.7	100	0	99.7	0	0	0	0	0	100	100	100	0	100	99.8
Bank 1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
% Bank 1	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0.2

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Flint St (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Data

Start Time	Grand River Ave Eastbound				Grand River Ave Westbound				Flint St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
1:00 PM	254	3	0	257	4	220	0	224	3	1	0	4	485
1:15 PM	202	6	0	208	3	212	0	215	5	2	0	7	430
1:30 PM	214	3	0	217	1	220	0	221	4	1	0	5	443
1:45 PM	208	3	0	211	3	211	0	214	2	1	0	3	428
Hourly Total	878	15	0	893	11	863	0	874	14	5	0	19	1786
2:00 PM	201	2	0	203	3	209	0	212	3	1	0	4	419
2:15 PM	223	2	0	225	1	204	0	205	3	3	0	6	436
2:30 PM	242	5	0	247	3	218	0	221	4	2	0	6	474
2:45 PM	225	2	0	227	7	251	0	258	6	1	0	7	492
Hourly Total	891	11	0	902	14	882	0	896	16	7	0	23	1821
Grand Total	1769	26	0	1795	25	1745	0	1770	30	12	0	42	3607
Approach %	98.6	1.4	-	-	1.4	98.6	-	-	71.4	28.6	-	-	-
Total %	49.0	0.7	-	49.8	0.7	48.4	-	49.1	0.8	0.3	-	1.2	-
Lights	1760	26	-	1786	23	1734	-	1757	29	11	-	40	3583
% Lights	99.5	100.0	-	99.5	92.0	99.4	-	99.3	96.7	91.7	-	95.2	99.3
Other Vehicles	9	0	-	9	2	11	-	13	1	1	-	2	24
% Other Vehicles	0.5	0.0	-	0.5	8.0	0.6	-	0.7	3.3	8.3	-	4.8	0.7
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Flint St (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Peak Hour Data (2:00 PM)

Start Time	Grand River Ave Eastbound				Grand River Ave Westbound				Flint St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
2:00 PM	201	2	0	203	3	209	0	212	3	1	0	4	419
2:15 PM	223	2	0	225	1	204	0	205	3	3	0	6	436
2:30 PM	242	5	0	247	3	218	0	221	4	2	0	6	474
2:45 PM	225	2	0	227	7	251	0	258	6	1	0	7	492
Total	891	11	0	902	14	882	0	896	16	7	0	23	1821
Approach %	98.8	1.2	-	-	1.6	98.4	-	-	69.6	30.4	-	-	-
Total %	48.9	0.6	-	49.5	0.8	48.4	-	49.2	0.9	0.4	-	1.3	-
PHF	0.920	0.550	-	0.913	0.500	0.878	-	0.868	0.667	0.583	-	0.821	0.925
Lights	888	11	-	899	13	876	-	889	16	7	-	23	1811
% Lights	99.7	100.0	-	99.7	92.9	99.3	-	99.2	100.0	100.0	-	100.0	99.5
Other Vehicles	3	0	-	3	1	6	-	7	0	0	-	0	10
% Other Vehicles	0.3	0.0	-	0.3	7.1	0.7	-	0.8	0.0	0.0	-	0.0	0.5
Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Grand River Ave- Sixth Gate 7-9 AM & 4-6 PM Combo
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Groups Printed- Cars - Trucks - Pedestrians

	SIXTH GATE From North					GRAND8 RIVER AVE From East					SIXTH GATE From South					GRAND8 RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	89	0	0	89	0	0	0	0	0	0	139	0	0	139	228
07:15 AM	0	0	0	0	0	0	103	0	0	103	0	0	0	0	0	1	132	0	0	133	236
07:30 AM	0	0	0	0	0	0	103	0	0	103	0	0	0	0	0	2	200	0	0	202	305
07:45 AM	0	0	0	0	0	0	114	0	0	114	1	0	0	0	1	1	225	0	0	226	341
Total	0	0	0	0	0	0	409	0	0	409	1	0	0	0	1	4	696	0	0	700	1110
08:00 AM	0	0	0	0	0	0	99	0	0	99	1	0	0	0	1	2	182	0	0	184	284
08:15 AM	0	0	0	0	0	0	103	0	0	103	1	0	0	0	1	1	180	0	0	181	285
08:30 AM	0	0	0	0	0	0	110	0	0	110	0	0	0	0	0	5	178	0	0	183	293
08:45 AM	0	0	0	0	0	0	110	0	0	110	0	0	0	0	0	4	195	0	0	199	309
Total	0	0	0	0	0	0	422	0	0	422	2	0	0	0	2	12	735	0	0	747	1171
*** BREAK ***																					
04:00 PM	0	0	0	0	0	0	189	1	0	190	0	0	1	0	1	0	184	0	0	184	375
04:15 PM	0	0	0	0	0	0	210	13	0	223	1	0	1	0	2	0	173	0	0	173	398
04:30 PM	0	0	0	0	0	0	212	0	0	212	0	0	2	0	2	1	181	0	0	182	396
04:45 PM	0	0	0	0	0	0	208	0	0	208	0	0	1	0	1	1	182	0	0	183	392
Total	0	0	0	0	0	0	819	14	0	833	1	0	5	0	6	2	720	0	0	722	1561
05:00 PM	0	0	0	0	0	0	209	1	0	210	1	0	1	0	2	1	165	0	0	166	378
05:15 PM	0	0	0	0	0	0	208	0	0	208	1	0	3	0	4	0	143	0	0	143	355
05:30 PM	0	0	0	0	0	0	192	0	0	192	0	0	1	0	1	1	141	0	0	142	335
05:45 PM	0	0	0	0	0	0	178	0	0	178	0	0	0	0	0	0	115	0	0	115	293
Total	0	0	0	0	0	0	787	1	0	788	2	0	5	0	7	2	564	0	0	566	1361
Grand Total	0	0	0	0	0	0	2437	15	0	2452	6	0	10	0	16	20	2715	0	0	2735	5203
Apprch %	0	0	0	0		0	99.4	0.6	0		37.5	0	62.5	0		0.7	99.3	0	0		
Total %	0	0	0	0	0	0	46.8	0.3	0	47.1	0.1	0	0.2	0	0.3	0.4	52.2	0	0	52.6	
Cars	0	0	0	0	0	0	2380	15	0	2395	6	0	9	0	15	19	2644	0	0	2663	5073
% Cars	0	0	0	0	0	0	97.7	100	0	97.7	100	0	90	0	93.8	95	97.4	0	0	97.4	97.5
Trucks	0	0	0	0	0	0	36	0	0	36	0	0	1	0	1	1	35	0	0	36	73
% Trucks	0	0	0	0	0	0	1.5	0	0	1.5	0	0	10	0	6.2	5	1.3	0	0	1.3	1.4
Pedestrians	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	36	0	0	36	57
% Pedestrians	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	0	1.3	0	0	1.3	1.1

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27777 Franklin Road, Suite 2000
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File Name : Grand River Ave- Sixth Gate 7-9 AM & 4-6 PM Combo
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	SIXTH GATE From North					GRAND8 RIVER AVE From East					SIXTH GATE From South					GRAND8 RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	103	0	0	103	0	0	0	0	0	**2**	200	0	0	202	305
07:45 AM	0	0	0	0	0	0	**114**	0	0	**114**	**1**	0	0	0	**1**	1	**225**	0	0	**226**	**341**
08:00 AM	0	0	0	0	0	0	99	0	0	99	1	0	0	0	1	2	182	0	0	184	284
08:15 AM	0	0	0	0	0	0	103	0	0	103	1	0	0	0	1	1	180	0	0	181	285
Total Volume	0	0	0	0	0	0	419	0	0	419	3	0	0	0	3	6	787	0	0	793	1215
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0.8	99.2	0	0		
PHF	.000	.000	.000	.000	.000	.000	.919	.000	.000	.919	.750	.000	.000	.000	.750	.750	.874	.000	.000	.877	.891
Cars	0	0	0	0	0	0	404	0	0	404	3	0	0	0	3	6	763	0	0	769	1176
% Cars	0	0	0	0	0	0	96.4	0	0	96.4	100	0	0	0	100	100	97.0	0	0	97.0	96.8
Trucks	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	9	0	0	9	17
% Trucks	0	0	0	0	0	0	1.9	0	0	1.9	0	0	0	0	0	0	1.1	0	0	1.1	1.4
Pedestrians	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	15	0	0	15	22
% Pedestrians	0	0	0	0	0	0	1.7	0	0	1.7	0	0	0	0	0	0	1.9	0	0	1.9	1.8

File Name : Grand River Ave- Sixth Gate 7-9 AM & 4-6 PM Combo
Site Code : 00000000
Start Date : 3/1/2018
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	SIXTH GATE From North					GRAND8 RIVER AVE From East					SIXTH GATE From South					GRAND8 RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	210	**13**	0	**223**	**1**	0	1	0	**2**	0	173	0	0	173	**398**
04:30 PM	0	0	0	0	0	0	**212**	0	0	212	0	0	**2**	0	2	**1**	181	0	0	182	396
04:45 PM	0	0	0	0	0	0	208	0	0	208	0	0	1	0	1	1	**182**	0	0	**183**	392
05:00 PM	0	0	0	0	0	0	209	1	0	210	1	0	1	0	2	1	165	0	0	166	378
Total Volume	0	0	0	0	0	0	839	14	0	853	2	0	5	0	7	3	701	0	0	704	1564
% App. Total	0	0	0	0		0	98.4	1.6	0		28.6	0	71.4	0		0.4	99.6	0	0		
PHF	.000	.000	.000	.000	.000	.000	.989	.269	.000	.956	.500	.000	.625	.000	.875	.750	.963	.000	.000	.962	.982
Cars	0	0	0	0	0	0	830	14	0	844	2	0	5	0	7	3	682	0	0	685	1536
% Cars	0	0	0	0	0	0	98.9	100	0	98.9	100	0	100	0	100	100	97.3	0	0	97.3	98.2
Trucks	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	10	0	0	10	16
% Trucks	0	0	0	0	0	0	0.7	0	0	0.7	0	0	0	0	0	0	1.4	0	0	1.4	1.0
Pedestrians	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	9	0	0	9	12
% Pedestrians	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0	1.3	0	0	1.3	0.8

AECOM
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File Name : Gd River and Sixth Gate - Saturday 1-3
Site Code : 00000000
Start Date : 3/24/2018

Groups Printed- Cars - Trucks - Pedestrians

	SIXTH GATE From North					GRAND RIVER From East					SIXTH GATE From South					GRAND RIVER From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	0	0	0	0	0	0	237	0	0	237	1	0	0	0	1	0	157	0	0	157	395
01:15 PM	0	0	0	0	0	0	196	0	0	196	2	0	0	0	2	0	167	0	0	167	365
01:30 PM	0	0	0	0	0	0	218	0	0	218	0	0	2	0	2	2	171	0	0	173	393
01:45 PM	0	0	0	0	0	0	222	0	0	222	1	0	0	0	1	1	170	0	0	171	394
Total	0	0	0	0	0	0	873	0	0	873	4	0	2	0	6	3	665	0	0	668	1547
02:00 PM	0	0	0	0	0	0	238	1	0	239	2	0	0	0	2	0	162	0	0	162	403
02:15 PM	0	0	0	0	0	0	232	0	0	232	0	0	0	0	0	0	159	0	0	159	391
02:30 PM	0	0	0	0	0	0	195	0	0	195	1	0	0	0	1	0	168	0	0	168	364
02:45 PM	0	0	0	0	0	0	204	0	0	204	0	0	0	0	0	1	160	2	0	163	367
Total	0	0	0	0	0	0	869	1	0	870	3	0	0	0	3	1	649	2	0	652	1525
Grand Total	0	0	0	0	0	0	1742	1	0	1743	7	0	2	0	9	4	1314	2	0	1320	3072
Apprch %	0	0	0	0		0	99.9	0.1	0		77.8	0	22.2	0		0.3	99.5	0.2	0		
Total %	0	0	0	0	0	0	56.7	0	0	56.7	0.2	0	0.1	0	0.3	0.1	42.8	0.1	0	43	
Cars	0	0	0	0	0	0	1742	1	0	1743	7	0	2	0	9	4	1314	2	0	1320	3072
% Cars	0	0	0	0	0	0	100	100	0	100	100	0	100	0	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name : Gd River and Sixth Gate - Saturday 1-3
Site Code : 00000000
Start Date : 3/24/2018

	SIXTH GATE From North					GRAND RIVER From East					SIXTH GATE From South					GRAND RIVER From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:30 PM																					
01:30 PM	0	0	0	0	0	0	218	0	0	218	0	0	**2**	0	**2**	**2**	**171**	0	0	**173**	393
01:45 PM	0	0	0	0	0	0	222	0	0	222	1	0	0	0	1	1	170	0	0	171	394
02:00 PM	0	0	0	0	0	0	**238**	**1**	0	**239**	**2**	0	0	0	2	0	162	0	0	162	**403**
02:15 PM	0	0	0	0	0	0	232	0	0	232	0	0	0	0	0	0	159	0	0	159	391
Total Volume	0	0	0	0	0	0	910	1	0	911	3	0	2	0	5	3	662	0	0	665	1581
% App. Total	0	0	0	0		0	99.9	0.1	0		60	0	40	0		0.5	99.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.956	.250	.000	.953	.375	.000	.250	.000	.625	.375	.968	.000	.000	.961	.981
Cars	0	0	0	0	0	0	910	1	0	911	3	0	2	0	5	3	662	0	0	665	1581
% Cars	0	0	0	0	0	0	100	100	0	100	100	0	100	0	100	100	100	0	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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2777 Franklin Road, Suite 2000
Southfield, MI 48034

Default Comments
Change These in The Preferences Window
Select File/Preference in the Main Scree
Then Click the Comments Tab

File Name : Grand River and Main combined
Site Code : 00000000
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	MAIN ST From North					GRAND RIVER AVE From East					MAIN ST From South					GRAND RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	21	11	21	1	54	33	176	14	0	223	14	2	17	0	33	19	124	8	0	151	461
04:15 PM	25	6	27	0	58	24	191	15	0	230	11	7	17	0	35	11	116	4	0	131	454
04:30 PM	17	10	18	0	45	33	181	17	0	231	20	5	18	0	43	21	147	7	0	175	494
04:45 PM	23	8	24	0	55	34	220	6	1	261	9	14	19	0	42	11	126	10	0	147	505
Total	86	35	90	1	212	124	768	52	1	945	54	28	71	0	153	62	513	29	0	604	1914
05:00 PM	35	15	40	0	90	40	220	13	0	273	12	11	30	0	53	16	139	11	0	166	582
05:15 PM	33	24	28	0	85	36	219	14	0	269	14	11	25	0	50	16	143	14	0	173	577
05:30 PM	26	23	29	0	78	35	205	7	0	247	12	8	13	0	33	11	142	17	0	170	528
05:45 PM	21	29	47	3	100	30	209	15	0	254	15	6	21	2	44	28	140	19	0	187	585
Total	115	91	144	3	353	141	853	49	0	1043	53	36	89	2	180	71	564	61	0	696	2272
*** BREAK ***																					
07:00 AM	5	0	5	0	10	5	73	2	0	80	2	1	4	0	7	4	109	3	0	116	213
07:15 AM	5	1	7	0	13	3	88	2	0	93	9	6	6	0	21	5	149	17	0	171	298
07:30 AM	6	2	2	0	10	13	89	4	0	106	10	2	5	0	17	6	139	12	0	157	290
07:45 AM	6	3	5	0	14	8	110	7	0	125	13	10	8	0	31	8	191	20	0	219	389
Total	22	6	19	0	47	29	360	15	0	404	34	19	23	0	76	23	588	52	0	663	1190
08:00 AM	2	4	6	0	12	16	93	6	0	115	15	7	11	0	33	5	193	25	1	224	384
08:15 AM	8	2	5	0	15	10	100	3	0	113	18	6	8	0	32	10	195	22	0	227	387
08:30 AM	19	1	9	0	29	11	102	8	0	121	10	3	12	0	25	9	163	13	0	185	360
08:45 AM	20	1	4	0	25	20	117	8	0	145	9	6	11	0	26	10	165	19	0	194	390
Total	49	8	24	0	81	57	412	25	0	494	52	22	42	0	116	34	716	79	1	830	1521
Grand Total	272	140	277	4	693	351	2393	141	1	2886	193	105	225	2	525	190	2381	221	1	2793	6897
Apprch %	39.2	20.2	40	0.6		12.2	82.9	4.9	0		36.8	20	42.9	0.4		6.8	85.2	7.9	0		
Total %	3.9	2	4	0.1	10	5.1	34.7	2	0	41.8	2.8	1.5	3.3	0	7.6	2.8	34.5	3.2	0	40.5	
Unshifted	259	137	270	4	670	345	2341	139	1	2826	189	102	224	2	517	187	2327	210	1	2725	6738
% Unshifted	95.2	97.9	97.5	100	96.7	98.3	97.8	98.6	100	97.9	97.9	97.1	99.6	100	98.5	98.4	97.7	95	100	97.6	97.7
Bank 1	7	2	2	0	11	5	30	2	0	37	3	3	1	0	7	2	33	7	0	42	97
% Bank 1	2.6	1.4	0.7	0	1.6	1.4	1.3	1.4	0	1.3	1.6	2.9	0.4	0	1.3	1.1	1.4	3.2	0	1.5	1.4
Bank 2	6	1	5	0	12	1	22	0	0	23	1	0	0	0	1	1	21	4	0	26	62
% Bank 2	2.2	0.7	1.8	0	1.7	0.3	0.9	0	0	0.8	0.5	0	0	0	0.2	0.5	0.9	1.8	0	0.9	0.9

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File Name : Grand River and Main combined
Site Code : 00000000
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	MAIN ST From North					GRAND RIVER AVE From East					MAIN ST From South					GRAND RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 08:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**35**	15	40	0	90	**40**	**220**	13	0	**273**	12	**11**	**30**	0	**53**	16	139	11	0	166	582
05:15 PM	33	24	28	0	85	36	219	14	0	269	14	11	25	0	50	16	**143**	14	0	173	577
05:30 PM	26	23	29	0	78	35	205	7	0	247	12	8	13	0	33	11	142	17	0	170	528
05:45 PM	21	**29**	**47**	**3**	**100**	30	209	**15**	0	254	**15**	6	21	**2**	44	**28**	140	**19**	0	**187**	**585**
Total Volume	115	91	144	3	353	141	853	49	0	1043	53	36	89	2	180	71	564	61	0	696	2272
% App. Total	32.6	25.8	40.8	0.8		13.5	81.8	4.7	0		29.4	20	49.4	1.1		10.2	81	8.8	0		
PHF	.821	.784	.766	.250	.883	.881	.969	.817	.000	.955	.883	.818	.742	.250	.849	.634	.986	.803	.000	.930	.971
Unshifted	115	91	144	3	353	141	847	49	0	1037	51	35	89	2	177	71	556	59	0	686	2253
% Unshifted	100	100	100	100	100	100	99.3	100	0	99.4	96.2	97.2	100	100	98.3	100	98.6	96.7	0	98.6	99.2
Bank 1	0	0	0	0	0	0	2	0	0	2	1	1	0	0	2	0	2	1	0	3	7
% Bank 1	0	0	0	0	0	0	0.2	0	0	0.2	1.9	2.8	0	0	1.1	0	0.4	1.6	0	0.4	0.3
Bank 2	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	0	6	1	0	7	12
% Bank 2	0	0	0	0	0	0	0.5	0	0	0.4	1.9	0	0	0	0.6	0	1.1	1.6	0	1.0	0.5

AECOM
2777 Franklin Road, Suite 2000
Southfield, MI 48034

File Name : Grand River and Main combined
Site Code : 00000000
Start Date : 3/6/2018
Page No : 3

	MAIN ST From North					GRAND RIVER AVE From East					MAIN ST From South					GRAND RIVER AVE From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	2	**4**	6	0	12	16	93	6	0	115	15	**7**	11	0	**33**	5	193	**25**	**1**	224	384
08:15 AM	8	2	5	0	15	10	100	3	0	113	**18**	6	8	0	32	**10**	**195**	22	0	**227**	387
08:30 AM	19	1	**9**	0	**29**	11	102	**8**	0	121	10	3	**12**	0	25	9	163	13	0	185	360
08:45 AM	**20**	1	4	0	25	**20**	**117**	8	0	**145**	9	6	11	0	26	10	165	19	0	194	**390**
Total Volume	49	8	24	0	81	57	412	25	0	494	52	22	42	0	116	34	716	79	1	830	1521
% App. Total	60.5	9.9	29.6	0		11.5	83.4	5.1	0		44.8	19	36.2	0		4.1	86.3	9.5	0.1		
PHF	.613	.500	.667	.000	.698	.713	.880	.781	.000	.852	.722	.786	.875	.000	.879	.850	.918	.790	.250	.914	.975
Unshifted	42	8	20	0	70	53	389	24	0	466	51	21	41	0	113	33	695	71	1	800	1449
% Unshifted	85.7	100	83.3	0	86.4	93.0	94.4	96.0	0	94.3	98.1	95.5	97.6	0	97.4	97.1	97.1	89.9	100	96.4	95.3
Bank 1	4	0	2	0	6	3	13	1	0	17	1	1	1	0	3	0	15	5	0	20	46
% Bank 1	8.2	0	8.3	0	7.4	5.3	3.2	4.0	0	3.4	1.9	4.5	2.4	0	2.6	0	2.1	6.3	0	2.4	3.0
Bank 2	3	0	2	0	5	1	10	0	0	11	0	0	0	0	0	1	6	3	0	10	26
% Bank 2	6.1	0	8.3	0	6.2	1.8	2.4	0	0	2.2	0	0	0	0	0	2.9	0.8	3.8	0	1.2	1.7

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Town Center Dr (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Data

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Main St Northbound					Town Center Dr Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	9	154	14	0	177	6	154	50	0	210	15	8	17	0	40	28	10	11	0	49	476
1:15 PM	6	117	18	0	141	6	166	31	0	203	17	8	10	0	35	33	7	12	0	52	431
1:30 PM	15	140	14	0	169	10	183	35	0	228	17	10	11	0	38	35	12	12	0	59	494
1:45 PM	12	129	17	1	158	11	159	39	0	209	19	8	11	0	38	30	9	15	0	54	459
Hourly Total	42	540	63	1	645	33	662	155	0	850	68	34	49	0	151	126	38	50	0	214	1860
2:00 PM	11	144	15	0	170	5	164	31	0	200	26	8	9	0	43	27	7	9	0	43	456
2:15 PM	10	150	14	0	174	8	156	35	1	199	23	10	15	0	48	44	7	17	0	68	489
2:30 PM	9	146	13	0	168	8	140	44	1	192	16	8	14	0	38	42	4	14	0	60	458
2:45 PM	10	146	15	0	171	7	172	46	2	225	26	10	15	1	51	48	16	12	0	76	523
Hourly Total	40	586	57	0	683	28	632	156	4	816	91	36	53	1	180	161	34	52	0	247	1926
Grand Total	82	1126	120	1	1328	61	1294	311	4	1666	159	70	102	1	331	287	72	102	0	461	3786
Approach %	6.2	84.8	9.0	-	-	3.7	77.7	18.7	-	-	48.0	21.1	30.8	-	-	62.3	15.6	22.1	-	-	-
Total %	2.2	29.7	3.2	-	35.1	1.6	34.2	8.2	-	44.0	4.2	1.8	2.7	-	8.7	7.6	1.9	2.7	-	12.2	-
Lights	82	1121	120	-	1323	61	1284	311	-	1656	158	70	102	-	330	287	72	101	-	460	3769
% Lights	100.0	99.6	100.0	-	99.6	100.0	99.2	100.0	-	99.4	99.4	100.0	100.0	-	99.7	100.0	100.0	99.0	-	99.8	99.6
Other Vehicles	0	5	0	-	5	0	10	0	-	10	1	0	0	-	1	0	0	1	-	1	17
% Other Vehicles	0.0	0.4	0.0	-	0.4	0.0	0.8	0.0	-	0.6	0.6	0.0	0.0	-	0.3	0.0	0.0	1.0	-	0.2	0.4
Pedestrians	-	-	-	1	-	-	-	-	4	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Town Center Dr (Sat.)
Site Code:
Start Date: 04/07/2018

Turning Movement Peak Hour Data (2:00 PM)

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Main St Northbound					Town Center Dr Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
2:00 PM	11	144	15	0	170	5	164	31	0	200	26	8	9	0	43	27	7	9	0	43	456
2:15 PM	10	150	14	0	174	8	156	35	1	199	23	10	15	0	48	44	7	17	0	68	489
2:30 PM	9	146	13	0	168	8	140	44	1	192	16	8	14	0	38	42	4	14	0	60	458
2:45 PM	10	146	15	0	171	7	172	46	2	225	26	10	15	1	51	48	16	12	0	76	523
Total	40	586	57	0	683	28	632	156	4	816	91	36	53	1	180	161	34	52	0	247	1926
Approach %	5.9	85.8	8.3	-	-	3.4	77.5	19.1	-	-	50.6	20.0	29.4	-	-	65.2	13.8	21.1	-	-	-
Total %	2.1	30.4	3.0	-	35.5	1.5	32.8	8.1	-	42.4	4.7	1.9	2.8	-	9.3	8.4	1.8	2.7	-	12.8	-
PHF	0.909	0.977	0.950	-	0.981	0.875	0.919	0.848	-	0.907	0.875	0.900	0.883	-	0.882	0.839	0.531	0.765	-	0.813	0.921
Lights	40	583	57	-	680	28	632	156	-	816	90	36	53	-	179	161	34	52	-	247	1922
% Lights	100.0	99.5	100.0	-	99.6	100.0	100.0	100.0	-	100.0	98.9	100.0	100.0	-	99.4	100.0	100.0	100.0	-	100.0	99.8
Other Vehicles	0	3	0	-	3	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	4
% Other Vehicles	0.0	0.5	0.0	-	0.4	0.0	0.0	0.0	-	0.0	1.1	0.0	0.0	-	0.6	0.0	0.0	0.0	-	0.0	0.2
Pedestrians	-	-	-	0	-	-	-	-	4	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Meadowbrook Rd (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Data

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Meadowbrook Rd Northbound					Meadowbrook Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	18	117	37	0	172	9	166	18	0	193	50	27	9	0	86	17	47	22	0	86	537
1:15 PM	18	124	41	0	183	9	140	21	0	170	42	43	10	0	95	29	48	14	0	91	539
1:30 PM	16	100	44	0	160	11	140	24	0	175	45	55	6	0	106	14	55	18	1	87	528
1:45 PM	29	131	41	0	201	9	174	26	0	209	37	52	11	0	100	14	55	22	0	91	601
Hourly Total	81	472	163	0	716	38	620	89	0	747	174	177	36	0	387	74	205	76	1	355	2205
2:00 PM	13	130	47	0	190	13	166	26	0	205	53	36	10	0	99	27	55	25	1	107	601
2:15 PM	14	138	34	0	186	9	127	16	0	152	37	55	4	0	96	13	48	11	0	72	506
2:30 PM	14	114	41	0	169	12	144	13	0	169	43	43	12	0	98	11	50	17	0	78	514
2:45 PM	8	141	41	0	190	14	128	12	0	154	42	49	4	0	95	17	48	23	0	88	527
Hourly Total	49	523	163	0	735	48	565	67	0	680	175	183	30	0	388	68	201	76	1	345	2148
3:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	131	995	326	0	1452	86	1185	156	0	1427	349	360	66	0	775	142	406	152	2	700	4354
Approach %	9.0	68.5	22.5	-	-	6.0	83.0	10.9	-	-	45.0	46.5	8.5	-	-	20.3	58.0	21.7	-	-	-
Total %	3.0	22.9	7.5	-	33.3	2.0	27.2	3.6	-	32.8	8.0	8.3	1.5	-	17.8	3.3	9.3	3.5	-	16.1	-
Lights	130	984	325	-	1439	85	1179	156	-	1420	349	359	66	-	774	141	405	151	-	697	4330
% Lights	99.2	98.9	99.7	-	99.1	98.8	99.5	100.0	-	99.5	100.0	99.7	100.0	-	99.9	99.3	99.8	99.3	-	99.6	99.4
Other Vehicles	1	11	1	-	13	1	6	0	-	7	0	1	0	-	1	1	1	1	-	3	24
% Other Vehicles	0.8	1.1	0.3	-	0.9	1.2	0.5	0.0	-	0.5	0.0	0.3	0.0	-	0.1	0.7	0.2	0.7	-	0.4	0.6
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Ave @ Meadowbrook Rd (Sat.)
Site Code:
Start Date: 03/24/2018

Turning Movement Peak Hour Data (1:15 PM)

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Meadowbrook Rd Northbound					Meadowbrook Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:15 PM	18	124	41	0	183	9	140	21	0	170	42	43	10	0	95	29	48	14	0	91	539
1:30 PM	16	100	44	0	160	11	140	24	0	175	45	55	6	0	106	14	55	18	1	87	528
1:45 PM	29	131	41	0	201	9	174	26	0	209	37	52	11	0	100	14	55	22	0	91	601
2:00 PM	13	130	47	0	190	13	166	26	0	205	53	36	10	0	99	27	55	25	1	107	601
Total	76	485	173	0	734	42	620	97	0	759	177	186	37	0	400	84	213	79	2	376	2269
Approach %	10.4	66.1	23.6	-	-	5.5	81.7	12.8	-	-	44.3	46.5	9.3	-	-	22.3	56.6	21.0	-	-	-
Total %	3.3	21.4	7.6	-	32.3	1.9	27.3	4.3	-	33.5	7.8	8.2	1.6	-	17.6	3.7	9.4	3.5	-	16.6	-
PHF	0.655	0.926	0.920	-	0.913	0.808	0.891	0.933	-	0.908	0.835	0.845	0.841	-	0.943	0.724	0.968	0.790	-	0.879	0.944
Lights	75	480	173	-	728	41	618	97	-	756	177	185	37	-	399	83	212	78	-	373	2256
% Lights	98.7	99.0	100.0	-	99.2	97.6	99.7	100.0	-	99.6	100.0	99.5	100.0	-	99.8	98.8	99.5	98.7	-	99.2	99.4
Other Vehicles	1	5	0	-	6	1	2	0	-	3	0	1	0	-	1	1	1	1	-	3	13
% Other Vehicles	1.3	1.0	0.0	-	0.8	2.4	0.3	0.0	-	0.4	0.0	0.5	0.0	-	0.3	1.2	0.5	1.3	-	0.8	0.6
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Avenue @ Meadowbrook Road
Site Code:
Start Date: 03/15/2018

Turning Movement Data

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Meadowbrook Rd Northbound					Meadowbrook Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	17	95	10	0	122	1	50	30	0	81	23	44	14	0	81	22	10	5	0	37	321
7:15 AM	18	102	13	0	133	2	48	16	0	66	22	39	16	0	77	15	12	2	0	29	305
7:30 AM	29	137	13	0	179	2	55	26	0	83	24	62	16	0	102	33	21	5	0	59	423
7:45 AM	37	140	10	0	187	5	63	41	0	109	37	75	27	0	139	30	33	6	0	69	504
Hourly Total	101	474	46	0	621	10	216	113	0	339	106	220	73	0	399	100	76	18	0	194	1553
8:00 AM	32	133	9	0	174	1	76	69	0	146	27	66	17	0	110	30	25	14	0	69	499
8:15 AM	28	144	17	0	189	6	78	48	0	132	38	59	23	0	120	24	26	10	0	60	501
8:30 AM	31	119	16	1	166	7	70	37	0	114	28	70	23	0	121	32	30	17	0	79	480
8:45 AM	16	142	19	0	177	6	80	39	0	125	33	63	22	0	118	33	38	16	0	87	507
Hourly Total	107	538	61	1	706	20	304	193	0	517	126	258	85	0	469	119	119	57	0	295	1987
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	10	101	40	0	151	16	196	35	0	247	33	55	11	0	99	30	62	28	0	120	617
4:15 PM	24	112	46	0	182	13	191	14	0	218	35	36	13	0	84	30	79	25	0	134	618
4:30 PM	17	120	35	0	172	19	202	30	0	251	33	51	8	1	92	27	84	32	0	143	658
4:45 PM	15	100	50	0	165	8	221	25	0	254	48	44	11	0	103	27	58	36	0	121	643
Hourly Total	66	433	171	0	670	56	810	104	0	970	149	186	43	1	378	114	283	121	0	518	2536
5:00 PM	18	108	54	0	180	21	198	22	0	241	34	42	13	0	89	58	117	24	0	199	709
5:15 PM	25	104	52	0	181	12	189	26	0	227	59	54	11	0	124	45	95	31	1	171	703
5:30 PM	20	109	55	0	184	16	209	16	0	241	38	56	11	0	105	23	78	31	0	132	662
5:45 PM	22	88	41	0	151	19	191	33	0	243	59	56	8	0	123	36	78	42	1	156	673
Hourly Total	85	409	202	0	696	68	787	97	0	952	190	208	43	0	441	162	368	128	2	658	2747
Grand Total	359	1854	480	1	2693	154	2117	507	0	2778	571	872	244	1	1687	495	846	324	2	1665	8823
Approach %	13.3	68.8	17.8	-	-	5.5	76.2	18.3	-	-	33.8	51.7	14.5	-	-	29.7	50.8	19.5	-	-	-
Total %	4.1	21.0	5.4	-	30.5	1.7	24.0	5.7	-	31.5	6.5	9.9	2.8	-	19.1	5.6	9.6	3.7	-	18.9	-
Lights	355	1819	471	-	2645	151	2090	500	-	2741	563	865	241	-	1669	487	841	322	-	1650	8705
% Lights	98.9	98.1	98.1	-	98.2	98.1	98.7	98.6	-	98.7	98.6	99.2	98.8	-	98.9	98.4	99.4	99.4	-	99.1	98.7
Other Vehicles	4	35	9	-	48	3	27	7	-	37	8	7	3	-	18	8	5	2	-	15	118
% Other Vehicles	1.1	1.9	1.9	-	1.8	1.9	1.3	1.4	-	1.3	1.4	0.8	1.2	-	1.1	1.6	0.6	0.6	-	0.9	1.3
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Avenue @ Meadowbrook Road
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Meadowbrook Rd Northbound					Meadowbrook Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
8:00 AM	32	133	9	0	174	1	76	69	0	146	27	66	17	0	110	30	25	14	0	69	499
8:15 AM	28	144	17	0	189	6	78	48	0	132	38	59	23	0	120	24	26	10	0	60	501
8:30 AM	31	119	16	1	166	7	70	37	0	114	28	70	23	0	121	32	30	17	0	79	480
8:45 AM	16	142	19	0	177	6	80	39	0	125	33	63	22	0	118	33	38	16	0	87	507
Total	107	538	61	1	706	20	304	193	0	517	126	258	85	0	469	119	119	57	0	295	1987
Approach %	15.2	76.2	8.6	-	-	3.9	58.8	37.3	-	-	26.9	55.0	18.1	-	-	40.3	40.3	19.3	-	-	-
Total %	5.4	27.1	3.1	-	35.5	1.0	15.3	9.7	-	26.0	6.3	13.0	4.3	-	23.6	6.0	6.0	2.9	-	14.8	-
PHF	0.836	0.934	0.803	-	0.934	0.714	0.950	0.699	-	0.885	0.829	0.921	0.924	-	0.969	0.902	0.783	0.838	-	0.848	0.980
Lights	105	527	56	-	688	18	290	190	-	498	121	258	84	-	463	116	115	56	-	287	1936
% Lights	98.1	98.0	91.8	-	97.5	90.0	95.4	98.4	-	96.3	96.0	100.0	98.8	-	98.7	97.5	96.6	98.2	-	97.3	97.4
Other Vehicles	2	11	5	-	18	2	14	3	-	19	5	0	1	-	6	3	4	1	-	8	51
% Other Vehicles	1.9	2.0	8.2	-	2.5	10.0	4.6	1.6	-	3.7	4.0	0.0	1.2	-	1.3	2.5	3.4	1.8	-	2.7	2.6
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AECOM Corp
3950 Sparks Drive SE

Grand Rapids, Michigan, United States 49546
(616) 574-8500

Count Name: Grand River Avenue @ Meadowbrook Road
Site Code:
Start Date: 03/15/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Grand River Ave Eastbound					Grand River Ave Westbound					Meadowbrook Rd Northbound					Meadowbrook Rd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
5:00 PM	18	108	54	0	180	21	198	22	0	241	34	42	13	0	89	58	117	24	0	199	709
5:15 PM	25	104	52	0	181	12	189	26	0	227	59	54	11	0	124	45	95	31	1	171	703
5:30 PM	20	109	55	0	184	16	209	16	0	241	38	56	11	0	105	23	78	31	0	132	662
5:45 PM	22	88	41	0	151	19	191	33	0	243	59	56	8	0	123	36	78	42	1	156	673
Total	85	409	202	0	696	68	787	97	0	952	190	208	43	0	441	162	368	128	2	658	2747
Approach %	12.2	58.8	29.0	-	-	7.1	82.7	10.2	-	-	43.1	47.2	9.8	-	-	24.6	55.9	19.5	-	-	-
Total %	3.1	14.9	7.4	-	25.3	2.5	28.6	3.5	-	34.7	6.9	7.6	1.6	-	16.1	5.9	13.4	4.7	-	24.0	-
PHF	0.850	0.938	0.918	-	0.946	0.810	0.941	0.735	-	0.979	0.805	0.929	0.827	-	0.889	0.698	0.786	0.762	-	0.827	0.969
Lights	85	403	201	-	689	67	787	97	-	951	190	204	43	-	437	161	368	128	-	657	2734
% Lights	100.0	98.5	99.5	-	99.0	98.5	100.0	100.0	-	99.9	100.0	98.1	100.0	-	99.1	99.4	100.0	100.0	-	99.8	99.5
Other Vehicles	0	6	1	-	7	1	0	0	-	1	0	4	0	-	4	1	0	0	-	1	13
% Other Vehicles	0.0	1.5	0.5	-	1.0	1.5	0.0	0.0	-	0.1	0.0	1.9	0.0	-	0.9	0.6	0.0	0.0	-	0.2	0.5
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : 11 Mile Rd- Town Center Dr 7-9 AM & 4-6 PM Combo
Site Code : 00000000
Start Date : 2/27/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	TOWN CENTER DR From North					11 MILE RD From East					TOWN CENTER DR From South					11 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	2	8	1	11	4	2	0	2	8	6	3	4	1	14	0	16	1	0	17	50
07:15 AM	0	3	5	2	10	4	5	4	2	15	8	2	4	2	16	4	21	2	0	27	68
07:30 AM	2	3	7	2	14	6	4	3	2	15	19	8	4	0	31	4	24	1	1	30	90
07:45 AM	0	6	13	4	23	6	4	2	0	12	17	15	4	0	36	5	17	2	0	24	95
Total	2	14	33	9	58	20	15	9	6	50	50	28	16	3	97	13	78	6	1	98	303
08:00 AM	0	4	22	7	33	6	5	2	0	13	17	8	5	0	30	5	17	4	0	26	102
08:15 AM	1	10	12	0	23	9	5	13	0	27	9	7	3	0	19	7	17	2	0	26	95
08:30 AM	1	5	12	6	24	12	11	7	0	30	16	11	8	1	36	5	17	0	0	22	112
08:45 AM	1	3	12	2	18	6	6	6	2	20	15	15	7	0	37	5	13	7	0	25	100
Total	3	22	58	15	98	33	27	28	2	90	57	41	23	1	122	22	64	13	0	99	409
*** BREAK ***																					
04:00 PM	1	21	6	0	28	52	23	23	2	100	3	14	24	0	41	24	18	1	0	43	212
04:15 PM	4	18	8	0	30	19	18	11	0	48	3	7	18	0	28	25	9	2	0	36	142
04:30 PM	2	14	14	0	30	35	28	26	0	89	7	14	18	0	39	30	10	1	0	41	199
04:45 PM	4	14	8	0	26	23	29	27	0	79	4	11	27	1	43	33	12	2	0	47	195
Total	11	67	36	0	114	129	98	87	2	316	17	46	87	1	151	112	49	6	0	167	748
05:00 PM	2	21	5	0	28	64	34	39	0	137	7	22	27	3	59	23	18	0	0	41	265
05:15 PM	2	25	10	0	37	38	41	43	0	122	5	19	25	0	49	32	15	0	0	47	255
05:30 PM	4	24	8	0	36	32	33	33	0	98	4	14	24	2	44	37	16	2	0	55	233
05:45 PM	1	20	11	0	32	23	37	25	1	86	4	17	29	0	50	35	21	2	0	58	226
Total	9	90	34	0	133	157	145	140	1	443	20	72	105	5	202	127	70	4	0	201	979
Grand Total	25	193	161	24	403	339	285	264	11	899	144	187	231	10	572	274	261	29	1	565	2439
Apprch %	6.2	47.9	40	6		37.7	31.7	29.4	1.2		25.2	32.7	40.4	1.7		48.5	46.2	5.1	0.2		
Total %	1	7.9	6.6	1	16.5	13.9	11.7	10.8	0.5	36.9	5.9	7.7	9.5	0.4	23.5	11.2	10.7	1.2	0	23.2	
Cars	24	189	158	24	395	336	284	260	11	891	142	182	227	10	561	271	261	29	1	562	2409
% Cars	96	97.9	98.1	100	98	99.1	99.6	98.5	100	99.1	98.6	97.3	98.3	100	98.1	98.9	100	100	100	99.5	98.8
Trucks	1	2	1	0	4	3	0	4	0	7	1	4	3	0	8	2	0	0	0	2	21
% Trucks	4	1	0.6	0	1	0.9	0	1.5	0	0.8	0.7	2.1	1.3	0	1.4	0.7	0	0	0	0.4	0.9
Pedestrians	0	2	2	0	4	0	1	0	0	1	1	1	1	0	3	1	0	0	0	1	9
% Pedestrians	0	1	1.2	0	1	0	0.4	0	0	0.1	0.7	0.5	0.4	0	0.5	0.4	0	0	0	0.2	0.4

AECOM

27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : 11 Mile Rd- Town Center Dr 7-9 AM & 4-6 PM Combo
Site Code : 00000000
Start Date : 2/27/2018
Page No : 3

	TOWN CENTER DR From North					11 MILE RD From East					TOWN CENTER DR From South					11 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	4	**22**	**7**	**33**	6	5	2	0	13	**17**	8	5	0	30	5	**17**	4	0	**26**	102
08:15 AM	**1**	**10**	12	0	23	9	5	**13**	0	27	9	7	3	0	19	**7**	17	2	0	26	95
08:30 AM	1	5	12	6	24	**12**	**11**	7	0	**30**	16	11	**8**	**1**	36	5	17	0	0	22	**112**
08:45 AM	1	3	12	2	18	6	6	6	**2**	20	15	**15**	7	0	**37**	5	13	**7**	0	25	100
Total Volume	3	22	58	15	98	33	27	28	2	90	57	41	23	1	122	22	64	13	0	99	409
% App. Total	3.1	22.4	59.2	15.3		36.7	30	31.1	2.2		46.7	33.6	18.9	0.8		22.2	64.6	13.1	0		
PHF	.750	.550	.659	.536	.742	.688	.614	.538	.250	.750	.838	.683	.719	.250	.824	.786	.941	.464	.000	.952	.913
Cars	2	22	58	15	97	30	26	25	2	83	57	36	23	1	117	21	64	13	0	98	395
% Cars	66.7	100	100	100	99.0	90.9	96.3	89.3	100	92.2	100	87.8	100	100	95.9	95.5	100	100	0	99.0	96.6
Trucks	1	0	0	0	1	3	0	3	0	6	0	4	0	0	4	0	0	0	0	0	11
% Trucks	33.3	0	0	0	1.0	9.1	0	10.7	0	6.7	0	9.8	0	0	3.3	0	0	0	0	0	2.7
Pedestrians	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	1	0	0	0	1	3
% Pedestrians	0	0	0	0	0	0	3.7	0	0	1.1	0	2.4	0	0	0.8	4.5	0	0	0	1.0	0.7

File Name : 11 Mile Rd- Town Center Dr 7-9 AM & 4-6 PM Combo
Site Code : 00000000
Start Date : 2/27/2018
Page No : 4

	TOWN CENTER DR From North					11 MILE RD From East					TOWN CENTER DR From South					11 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	2	21	5	0	28	**64**	34	39	0	**137**	**7**	**22**	27	**3**	**59**	23	18	0	0	41	**265**
05:15 PM	2	**25**	10	0	**37**	38	**41**	**43**	0	122	5	19	25	0	49	32	15	0	0	47	255
05:30 PM	**4**	24	8	0	36	32	33	33	0	98	4	14	24	2	44	**37**	16	**2**	0	55	233
05:45 PM	1	20	**11**	0	32	23	37	25	**1**	86	4	17	**29**	0	50	35	**21**	2	0	**58**	226
Total Volume	9	90	34	0	133	157	145	140	1	443	20	72	105	5	202	127	70	4	0	201	979
% App. Total	6.8	67.7	25.6	0		35.4	32.7	31.6	0.2		9.9	35.6	52	2.5		63.2	34.8	2	0		
PHF	.563	.900	.773	.000	.899	.613	.884	.814	.250	.808	.714	.818	.905	.417	.856	.858	.833	.500	.000	.866	.924
Cars	9	89	32	0	130	157	145	139	1	442	20	72	102	5	199	127	70	4	0	201	972
% Cars	100	98.9	94.1	0	97.7	100	100	99.3	100	99.8	100	100	97.1	100	98.5	100	100	100	0	100	99.3
Trucks	0	1	0	0	1	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	4
% Trucks	0	1.1	0	0	0.8	0	0	0.7	0	0.2	0	0	1.9	0	1.0	0	0	0	0	0	0.4
Pedestrians	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
% Pedestrians	0	0	5.9	0	1.5	0	0	0	0	0	0	0	1.0	0	0.5	0	0	0	0	0	0.3

AECOM
2777 Franklin Road, Suite 2000
Southfield, MI 48034

File Name : 11 Mile Rd- Town Center Dr 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	TOWN CENTER DR From North					11 MILE RD From East					TOWN CENTER DR From South					11 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	4	16	12	0	32	7	18	3	0	28	7	15	45	0	67	34	15	1	0	50	177
01:15 PM	3	13	10	0	26	8	32	4	0	44	3	14	40	0	57	39	20	3	0	62	189
01:30 PM	4	13	4	0	21	10	13	3	0	26	7	15	46	0	68	60	17	2	0	79	194
01:45 PM	5	18	8	0	31	13	15	7	1	36	6	13	45	0	64	44	17	4	0	65	196
Total	16	60	34	0	110	38	78	17	1	134	23	57	176	0	256	177	69	10	0	256	756
02:00 PM	6	21	6	0	33	8	23	5	2	38	5	13	42	0	60	45	26	2	0	73	204
02:15 PM	3	10	8	0	21	9	20	5	4	38	6	22	40	0	68	49	20	2	0	71	198
02:30 PM	4	20	9	0	33	8	21	7	0	36	6	15	33	0	54	41	26	2	0	69	192
02:45 PM	10	28	14	0	52	10	19	7	0	36	1	14	38	0	53	45	18	3	0	66	207
Total	23	79	37	0	139	35	83	24	6	148	18	64	153	0	235	180	90	9	0	279	801
Grand Total	39	139	71	0	249	73	161	41	7	282	41	121	329	0	491	357	159	19	0	535	1557
Apprch %	15.7	55.8	28.5	0		25.9	57.1	14.5	2.5		8.4	24.6	67	0		66.7	29.7	3.6	0		
Total %	2.5	8.9	4.6	0	16	4.7	10.3	2.6	0.4	18.1	2.6	7.8	21.1	0	31.5	22.9	10.2	1.2	0	34.4	
Cars	38	138	68	0	244	72	159	40	7	278	41	120	329	0	490	357	157	18	0	532	1544
% Cars	97.4	99.3	95.8	0	98	98.6	98.8	97.6	100	98.6	100	99.2	100	0	99.8	100	98.7	94.7	0	99.4	99.2
Trucks	1	1	3	0	5	1	2	0	0	3	0	1	0	0	1	0	2	0	0	2	11
% Trucks	2.6	0.7	4.2	0	2	1.4	1.2	0	0	1.1	0	0.8	0	0	0.2	0	1.3	0	0	0.4	0.7
Pedestrians	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
% Pedestrians	0	0	0	0	0	0	0	2.4	0	0.4	0	0	0	0	0	0	0	5.3	0	0.2	0.1

File Name : 11 Mile Rd- Town Center Dr 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 2

	TOWN CENTER DR From North					11 MILE RD From East					TOWN CENTER DR From South					11 MILE RD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	6	21	6	0	33	8	**23**	5	2	**38**	5	13	**42**	0	60	45	**26**	2	0	**73**	204
02:15 PM	3	10	8	0	21	9	20	5	**4**	38	**6**	**22**	40	0	**68**	**49**	20	2	0	71	198
02:30 PM	4	20	9	0	33	8	21	**7**	0	36	6	15	33	0	54	41	26	2	0	69	192
02:45 PM	**10**	**28**	**14**	0	**52**	**10**	19	7	0	36	1	14	38	0	53	45	18	**3**	0	66	**207**
Total Volume	23	79	37	0	139	35	83	24	6	148	18	64	153	0	235	180	90	9	0	279	801
% App. Total	16.5	56.8	26.6	0		23.6	56.1	16.2	4.1		7.7	27.2	65.1	0		64.5	32.3	3.2	0		
PHF	.575	.705	.661	.000	.668	.875	.902	.857	.375	.974	.750	.727	.911	.000	.864	.918	.865	.750	.000	.955	.967
Cars	23	79	36	0	138	35	83	23	6	147	18	63	153	0	234	180	89	9	0	278	797
% Cars	100	100	97.3	0	99.3	100	100	95.8	100	99.3	100	98.4	100	0	99.6	100	98.9	100	0	99.6	99.5
Trucks	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	3
% Trucks	0	0	2.7	0	0.7	0	0	0	0	0	0	1.6	0	0	0.4	0	1.1	0	0	0.4	0.4
Pedestrians	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Pedestrians	0	0	0	0	0	0	0	4.2	0	0.7	0	0	0	0	0	0	0	0	0	0	0.1

AECOM
2777 Franklin Road, Suite 2000
Southfield, MI 48034

File Name : Main and Potomac combined
Site Code : 00000000
Start Date : 2/27/2018
Page No : 1

Groups Printed- Cars - Trucks - Pedestrians

	MAIN AND POTOMAC From North					MAIN From East					MAIN AND POTOMAC From South					MAIN From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	16	11	0	0	27	0	0	0	1	1	0	3	6	0	9	11	0	9	0	20	57
04:15 PM	11	1	0	1	13	0	0	0	0	0	0	2	4	0	6	8	0	20	0	28	47
04:30 PM	20	13	0	0	33	0	0	0	0	0	0	0	4	0	4	6	0	30	0	36	73
04:45 PM	17	4	0	3	24	0	0	0	0	0	0	5	11	0	16	5	0	28	0	33	73
Total	64	29	0	4	97	0	0	0	1	1	0	10	25	0	35	30	0	87	0	117	250
05:00 PM	27	5	0	0	32	0	0	0	1	1	0	6	8	0	14	7	0	27	0	34	81
05:15 PM	27	10	1	2	40	0	0	0	0	0	0	10	1	0	11	5	0	26	0	31	82
05:30 PM	28	11	0	2	41	0	0	0	0	0	0	5	4	0	9	7	0	26	0	33	83
05:45 PM	27	15	0	0	42	0	0	0	0	0	0	7	7	0	14	4	0	27	0	31	87
Total	109	41	1	4	155	0	0	0	1	1	0	28	20	0	48	23	0	106	0	129	333
*** BREAK ***																					
07:00 AM	1	1	0	0	2	0	0	0	0	0	0	3	14	0	17	2	0	14	0	16	35
07:15 AM	1	0	0	0	1	0	0	0	0	0	0	12	11	0	23	6	0	14	0	20	44
07:30 AM	2	4	0	0	6	0	0	0	0	0	0	7	16	0	23	2	0	12	0	14	43
07:45 AM	2	3	0	0	5	0	0	0	0	0	0	20	14	0	34	1	0	18	0	19	58
Total	6	8	0	0	14	0	0	0	0	0	0	42	55	0	97	11	0	58	0	69	180
08:00 AM	3	1	0	0	4	0	0	0	0	0	0	8	10	0	18	4	0	9	0	13	35
08:15 AM	4	2	0	0	6	0	0	0	0	0	0	10	12	0	22	0	0	18	0	18	46
08:30 AM	6	0	0	0	6	0	0	0	0	0	0	15	9	0	24	2	0	23	1	26	56
08:45 AM	4	4	0	0	8	0	0	0	1	1	0	14	10	0	24	4	0	19	1	24	57
Total	17	7	0	0	24	0	0	0	1	1	0	47	41	0	88	10	0	69	2	81	194
Grand Total	196	85	1	8	290	0	0	0	3	3	0	127	141	0	268	74	0	320	2	396	957
Apprch %	67.6	29.3	0.3	2.8		0	0	0	100		0	47.4	52.6	0		18.7	0	80.8	0.5		
Total %	20.5	8.9	0.1	0.8	30.3	0	0	0	0.3	0.3	0	13.3	14.7	0	28	7.7	0	33.4	0.2	41.4	
Cars	195	84	1	8	288	0	0	0	3	3	0	121	141	0	262	72	0	316	2	390	943
% Cars	99.5	98.8	100	100	99.3	0	0	0	100	100	0	95.3	100	0	97.8	97.3	0	98.8	100	98.5	98.5
Trucks	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	3	0	3	9
% Trucks	0	1.2	0	0	0.3	0	0	0	0	0	0	3.9	0	0	1.9	0	0	0.9	0	0.8	0.9
Pedestrians	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0	1	0	3	5
% Pedestrians	0.5	0	0	0	0.3	0	0	0	0	0	0	0.8	0	0	0.4	2.7	0	0.3	0	0.8	0.5

AECOM
2777 Franklin Road, Suite 2000
Southfield, MI 48034

File Name : Main and Potomac combined
Site Code : 00000000
Start Date : 2/27/2018
Page No : 2

	MAIN AND POTOMAC From North					MAIN From East					MAIN AND POTOMAC From South					MAIN From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 12:30 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	27	5	0	0	32	0	0	0	**1**	**1**	0	6	**8**	0	**14**	**7**	0	**27**	0	**34**	81
05:15 PM	27	10	**1**	**2**	40	0	0	0	0	0	0	**10**	1	0	11	5	0	26	0	31	82
05:30 PM	**28**	11	0	2	41	0	0	0	0	0	0	5	4	0	9	7	0	26	0	33	83
05:45 PM	27	**15**	0	0	**42**	0	0	0	0	0	0	7	7	0	14	4	0	27	0	31	**87**
Total Volume	109	41	1	4	155	0	0	0	1	1	0	28	20	0	48	23	0	106	0	129	333
% App. Total	70.3	26.5	0.6	2.6		0	0	0	100		0	58.3	41.7	0		17.8	0	82.2	0		
PHF	.973	.683	.250	.500	.923	.000	.000	.000	.250	.250	.000	.700	.625	.000	.857	.821	.000	.981	.000	.949	.957
Cars	108	41	1	4	154	0	0	0	1	1	0	26	20	0	46	22	0	104	0	126	327
% Cars	99.1	100	100	100	99.4	0	0	0	100	100	0	92.9	100	0	95.8	95.7	0	98.1	0	97.7	98.2
Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	3
% Trucks	0	0	0	0	0	0	0	0	0	0	0	3.6	0	0	2.1	0	0	1.9	0	1.6	0.9
Pedestrians	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3
% Pedestrians	0.9	0	0	0	0.6	0	0	0	0	0	0	3.6	0	0	2.1	4.3	0	0	0	0.8	0.9
Peak Hour Analysis From 12:45 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	3										20	14		34						58
08:00 AM	3	1	0	0	4	0	0	0	0	0	0	8	10	0	18	4	0	9	0	13	35
08:15 AM	4	2	0	0	6	0	0	0	0	0	0	10	12	0	22	0	0	18	0	18	46
08:30 AM	6	0	0	0	6	0	0	0	0	0	0	15	9	0	24	2	0	23	1	26	56
Total Volume	15	6	0	0	21	0	0	0	0	0	0	53	45	0	98	7	0	68	1	76	195
% App. Total	71.4	28.6	0	0		0	0	0	0		0	54.1	45.9	0		9.2	0	89.5	1.3		
PHF	.625	.500	.000	.000	.875	.000	.000	.000	.000	.000	.000	.663	.804	.000	.721	.438	.000	.739	.250	.731	.841
Cars	15	6	0	0	21	0	0	0	0	0	0	53	45	0	98	7	0	67	1	75	194
% Cars	100	100	0	0	100	0	0	0	0	0	0	100	100	0	100	100	0	98.5	100	98.7	99.5
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	1.3	0.5
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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27777 Franklin Road, Suite 2000
Southfield MI, 48034

File Name : Main St- Potomac+Main St 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 1

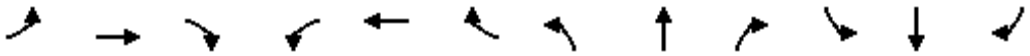
Groups Printed- Cars

	Main St From North					From East	Potomac St From South					Main St From West					
Start Time	Right	Thru	Left	Peds	App. Total	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	26	7	0	0	33	0	0	7	3	0	10	8	0	48	0	56	99
01:15 PM	17	8	0	0	25	0	0	5	7	0	12	7	0	25	0	32	69
01:30 PM	20	3	0	0	23	0	0	9	6	0	15	11	0	22	0	33	71
01:45 PM	16	4	0	0	20	0	0	5	7	0	12	10	0	42	0	52	84
Total	79	22	0	0	101	0	0	26	23	0	49	36	0	137	0	173	323
02:00 PM	11	9	0	0	20	0	0	6	9	0	15	9	0	27	0	36	71
02:15 PM	17	5	0	0	22	0	0	7	5	0	12	3	0	22	0	25	59
02:30 PM	12	6	0	0	18	0	0	5	6	0	11	7	0	24	0	31	60
02:45 PM	17	7	0	0	24	0	0	9	6	0	15	10	0	18	0	28	67
Total	57	27	0	0	84	0	0	27	26	0	53	29	0	91	0	120	257
Grand Total	136	49	0	0	185	0	0	53	49	0	102	65	0	228	0	293	580
Apprch %	73.5	26.5	0	0			0	52	48	0		22.2	0	77.8	0		
Total %	23.4	8.4	0	0	31.9	0	0	9.1	8.4	0	17.6	11.2	0	39.3	0	50.5	

File Name : Main St- Potomac+Main St 1-3 PM (Weekend Count)
Site Code : 00000000
Start Date : 3/24/2018
Page No : 2

	Main St From North					From East	Potomac St From South					Main St From West					
Start Time	Right	Thru	Left	Peds	App. Total	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	**26**	7	0	0	**33**	0	0	7	3	0	10	8	0	**48**	0	**56**	**99**
01:15 PM	17	**8**	0	0	25	0	0	5	**7**	0	12	7	0	25	0	32	69
01:30 PM	20	3	0	0	23	0	0	**9**	6	0	**15**	**11**	0	22	0	33	71
01:45 PM	16	4	0	0	20	0	0	5	7	0	12	10	0	42	0	52	84
Total Volume	79	22	0	0	101	0	0	26	23	0	49	36	0	137	0	173	323
% App. Total	78.2	21.8	0	0			0	53.1	46.9	0		20.8	0	79.2	0		
PHF	.760	.688	.000	.000	.765	.000	.000	.722	.821	.000	.817	.818	.000	.714	.000	.772	.816

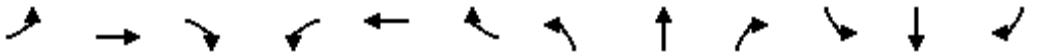
APPENDIX B-1. Existing (2018) Conditions Capacity Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	511	169	79	216	93	120	513	163	90	362	85
Future Volume (vph)	293	511	169	79	216	93	120	513	163	90	362	85
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3574		1776	3391		1844	3556		1863	3609	
Flt Permitted	0.42	1.00		0.26	1.00		0.42	1.00		0.27	1.00	
Satd. Flow (perm)	831	3574		482	3391		809	3556		537	3609	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	333	581	192	88	240	103	130	558	177	100	402	94
RTOR Reduction (vph)	0	30	0	0	52	0	0	22	0	0	15	0
Lane Group Flow (vph)	333	743	0	88	291	0	130	713	0	100	481	0
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	45.0	30.4		23.5	15.5		54.6	48.6		54.6	48.6	
Effective Green, g (s)	45.0	30.4		23.5	15.5		54.6	48.6		54.6	48.6	
Actuated g/C Ratio	0.38	0.26		0.20	0.13		0.46	0.41		0.46	0.41	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	512	913		182	441		423	1452		313	1473	
v/s Ratio Prot	c0.12	c0.21		0.03	0.09		0.02	c0.20		c0.02	0.13	
v/s Ratio Perm	0.12			0.06			0.13			0.13		
v/c Ratio	0.65	0.81		0.48	0.66		0.31	0.49		0.32	0.33	
Uniform Delay, d1	33.5	41.6		50.1	49.2		24.0	26.0		29.1	24.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.93	0.95	
Incremental Delay, d2	3.0	5.6		2.0	3.6		0.4	1.2		0.6	0.6	
Delay (s)	36.4	47.3		52.1	52.8		24.4	27.2		27.5	23.3	
Level of Service	D	D		D	D		C	C		C	C	
Approach Delay (s)		44.0			52.6			26.8			24.0	
Approach LOS		D			D			C			C	

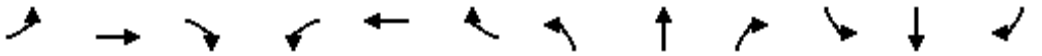
Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



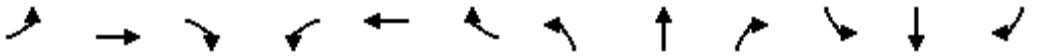
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	903	137	54	253	202	88	843	51	161	486	219
Future Volume (vph)	420	903	137	54	253	202	88	843	51	161	486	219
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1845	3617		1792	3585	1604	1845	3658		1845	3517	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1845	3617		1792	3585	1604	1845	3658		1845	3517	
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	483	1038	157	64	298	238	96	916	55	177	534	241
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	39	0
Lane Group Flow (vph)	483	1188	0	64	298	238	96	967	0	177	736	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	30.0	49.7		9.1	28.8	41.7	11.3	38.1		12.9	39.7	
Effective Green, g (s)	30.0	49.7		9.1	28.8	41.7	11.3	38.1		12.9	39.7	
Actuated g/C Ratio	0.22	0.37		0.07	0.21	0.31	0.08	0.28		0.10	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	413	1341		121	770	499	155	1040		177	1041	
v/s Ratio Prot	c0.26	c0.33		0.04	0.08	0.05	0.05	c0.26		c0.10	0.21	
v/s Ratio Perm						0.10						
v/c Ratio	1.17	0.89		0.53	0.39	0.48	0.62	0.93		1.00	0.71	
Uniform Delay, d1	52.0	39.5		60.4	45.0	37.3	59.3	46.7		60.5	42.0	
Progression Factor	1.00	1.00		1.15	0.81	0.83	0.87	0.86		1.26	0.57	
Incremental Delay, d2	99.4	8.9		4.3	1.4	0.8	6.9	13.6		66.2	2.2	
Delay (s)	151.4	48.4		73.7	37.9	31.6	58.5	53.7		142.8	26.1	
Level of Service	F	D		E	D	C	E	D		F	C	
Approach Delay (s)		78.0			39.2			54.2			47.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	60.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	716	34	25	412	57	42	22	52	24	8	49
Future Volume (vph)	79	716	34	25	412	57	42	22	52	24	8	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	3629		1792	1887	1604	1841	1748	1650	1667	1754	1457
Flt Permitted	0.43	1.00		0.32	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	834	3629		597	1887	1604	1454	1748	1650	1300	1754	1457
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.70	0.70	0.70
Adj. Flow (vph)	87	787	37	29	485	67	48	25	59	34	11	70
RTOR Reduction (vph)	0	2	0	0	0	22	0	0	55	0	0	67
Lane Group Flow (vph)	87	822	0	29	485	45	48	25	4	34	11	3
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	14%	14%	14%
Parking (#/hr)								0				
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	102.3	94.1		92.9	89.4	89.4	14.7	8.5	8.5	9.3	5.8	5.8
Effective Green, g (s)	102.3	94.1		92.9	89.4	89.4	14.7	8.5	8.5	9.3	5.8	5.8
Actuated g/C Ratio	0.76	0.70		0.69	0.67	0.67	0.11	0.06	0.06	0.07	0.04	0.04
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	697	2548		445	1258	1070	177	110	104	99	75	63
v/s Ratio Prot	c0.01	0.23		0.00	c0.26		c0.01	0.01		0.01	0.01	
v/s Ratio Perm	0.09			0.04		0.03	c0.02		0.00	0.01		0.00
v/c Ratio	0.12	0.32		0.07	0.39	0.04	0.27	0.23	0.04	0.34	0.15	0.05
Uniform Delay, d1	7.2	7.7		8.8	10.0	7.6	54.9	59.6	58.9	59.6	61.7	61.5
Progression Factor	0.43	0.54		0.35	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		0.1	0.9	0.1	0.8	1.1	0.1	2.1	0.9	0.3
Delay (s)	3.2	4.3		3.1	5.7	7.7	55.7	60.7	59.0	61.7	62.6	61.8
Level of Service	A	A		A	A	A	E	E	E	E	E	E
Approach Delay (s)		4.2			5.8			58.2			61.8	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



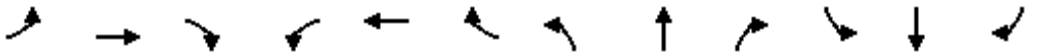
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	78	31	2	3	77	432	89	1	671	14
Future Volume (vph)	5	2	78	31	2	3	77	432	89	1	671	14
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	7	3	107	45	3	4	97	547	113	1	808	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	6
Lane Group Flow (vph)	7	3	107	45	7	0	97	547	80	1	808	11
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	6.0	20.8	6.5	6.5		8.8	95.4	95.4	1.3	87.9	87.9
Effective Green, g (s)	6.0	6.0	20.8	6.5	6.5		8.8	95.4	95.4	1.3	87.9	87.9
Actuated g/C Ratio	0.04	0.04	0.16	0.05	0.05		0.07	0.71	0.71	0.01	0.66	0.66
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	85	442	161	79		235	3773	1174	18	3511	1093
v/s Ratio Prot	0.00	0.00	c0.04	c0.01	0.00		c0.03	0.10		0.00	c0.15	
v/s Ratio Perm									0.05			0.01
v/c Ratio	0.09	0.04	0.24	0.28	0.09		0.41	0.14	0.07	0.06	0.23	0.01
Uniform Delay, d1	61.4	61.2	49.7	61.5	60.9		60.1	6.2	5.8	65.7	9.3	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.45	0.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	1.1	0.6		1.2	0.1	0.1	1.3	0.2	0.0
Delay (s)	61.8	61.4	50.0	62.6	61.5		58.1	2.8	0.1	67.0	9.5	8.0
Level of Service	E	E	D	E	E		E	A	A	E	A	A
Approach Delay (s)		51.0			62.5			9.5			9.5	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	538	61	20	304	193	126	258	85	119	119	57
Future Volume (vph)	107	538	61	20	304	193	126	258	85	119	119	57
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1845	1942	1650	1827	1923	1635	1860	1961	1667	1845	1942	1620
Flt Permitted	0.48	1.00	1.00	0.28	1.00	1.00	0.59	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	931	1942	1650	538	1923	1635	1150	1961	1667	503	1942	1620
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	115	578	66	22	342	217	133	272	89	140	140	67
RTOR Reduction (vph)	0	0	27	0	0	89	0	0	69	0	0	52
Lane Group Flow (vph)	115	578	39	22	342	128	133	272	20	140	140	15
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	72.7	67.2	78.9	72.7	67.2	79.2	36.0	24.3	29.8	36.6	24.6	30.1
Effective Green, g (s)	72.7	67.2	78.9	72.7	67.2	79.2	36.0	24.3	29.8	36.6	24.6	30.1
Actuated g/C Ratio	0.54	0.50	0.59	0.54	0.50	0.59	0.27	0.18	0.22	0.27	0.18	0.22
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	542	973	971	344	964	966	370	355	370	257	356	363
v/s Ratio Prot	c0.01	c0.30	0.00	0.00	0.18	0.01	0.03	c0.14	0.00	c0.05	0.07	0.00
v/s Ratio Perm	0.11		0.02	0.03		0.07	0.07		0.01	0.10		0.01
v/c Ratio	0.21	0.59	0.04	0.06	0.35	0.13	0.36	0.77	0.05	0.54	0.39	0.04
Uniform Delay, d1	15.3	23.7	11.6	16.6	20.3	12.2	38.6	52.1	41.0	39.1	48.1	40.7
Progression Factor	0.37	0.35	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.6	0.0	0.1	1.0	0.1	0.6	9.8	0.1	2.4	0.8	0.0
Delay (s)	5.8	11.0	10.1	16.7	21.3	12.2	39.2	61.9	41.1	41.5	49.0	40.7
Level of Service	A	B	B	B	C	B	D	E	D	D	D	D
Approach Delay (s)		10.1			17.7			52.1			44.4	
Approach LOS		B			B			D			D	

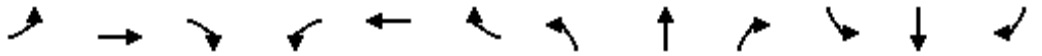
Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



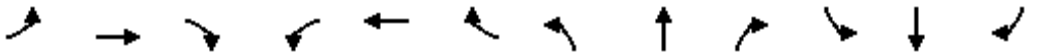
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	6	2	1	67	2	1229	15	191	948	12
Future Volume (vph)	8	0	6	2	1	67	2	1229	15	191	948	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3390	1667		1890	2933	1845	5292		3579	3689	1650
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3390	1667		1890	2933	1845	5292		3579	3689	1650
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.86	0.86	0.86	0.88	0.88	0.88
Adj. Flow (vph)	13	0	10	3	1	92	2	1429	17	217	1077	14
RTOR Reduction (vph)	0	0	10	0	0	78	0	1	0	0	0	3
Lane Group Flow (vph)	6	7	0	0	4	14	2	1445	0	217	1077	11
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	3.6	3.6	6.0		1.2	20.6	2.4	85.0		19.4	102.0	105.6
Effective Green, g (s)	3.6	3.6	6.0		1.2	20.6	2.4	85.0		19.4	102.0	105.6
Actuated g/C Ratio	0.03	0.03	0.04		0.01	0.15	0.02	0.63		0.14	0.76	0.79
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	45	91	74		16	590	33	3356		518	2808	1300
v/s Ratio Prot	c0.00	0.00	0.00		c0.00	0.00	0.00	c0.27		0.06	c0.29	0.00
v/s Ratio Perm			0.00			0.00						0.01
v/c Ratio	0.13	0.08	0.01		0.25	0.02	0.06	0.43		0.42	0.38	0.01
Uniform Delay, d1	63.7	63.6	61.2		66.0	48.2	64.7	12.3		52.2	5.4	3.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.95	0.96		0.95	0.52	1.00
Incremental Delay, d2	1.3	0.4	0.0		10.9	0.0	0.3	0.2		0.6	0.4	0.0
Delay (s)	65.0	63.9	61.2		76.9	48.2	61.6	12.0		50.0	3.2	3.0
Level of Service	E	E	E		E	D	E	B		D	A	A
Approach Delay (s)		63.0			49.4			12.1			11.0	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



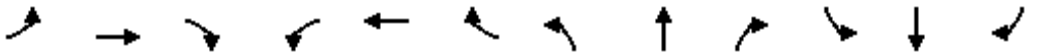
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	13	79	22	2	32	30	923	43	41	561	12
Future Volume (vph)	31	13	79	22	2	32	30	923	43	41	561	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		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		0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1734		1863	1961	1667	1845	3665		1810	3608	
Flt Permitted		0.91		0.37	1.00	1.00	0.40	1.00		0.25	1.00	
Satd. Flow (perm)		1603		719	1961	1667	779	3665		469	3608	
Peak-hour factor, PHF	0.72	0.72	0.72	0.74	0.74	0.74	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	43	18	110	30	3	43	32	992	46	46	623	13
RTOR Reduction (vph)	0	57	0	0	0	38	0	2	0	0	1	0
Lane Group Flow (vph)	0	114	0	30	3	5	32	1036	0	46	635	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.5		14.5	14.5	14.5	99.2	95.8		103.8	98.1	
Effective Green, g (s)		14.5		14.5	14.5	14.5	99.2	95.8		103.8	98.1	
Actuated g/C Ratio		0.11		0.11	0.11	0.11	0.74	0.71		0.77	0.73	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173		77	212	180	603	2620		420	2641	
v/s Ratio Prot					0.00		0.00	c0.28		c0.00	0.18	
v/s Ratio Perm		c0.07		0.04		0.00	0.04			0.08		
v/c Ratio		0.66		0.39	0.01	0.03	0.05	0.40		0.11	0.24	
Uniform Delay, d1		57.4		55.6	53.4	53.4	5.3	7.6		6.8	5.8	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		0.71	0.79	
Incremental Delay, d2		8.7		3.2	0.0	0.1	0.0	0.4		0.1	0.2	
Delay (s)		66.0		58.9	53.4	53.5	5.4	8.0		5.0	4.7	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		66.0			55.6			8.0			4.8	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



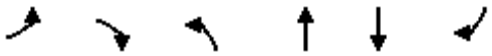
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	37	1	0	5	35	844	1	16	575	31
Future Volume (vph)	26	0	37	1	0	5	35	844	1	16	575	31
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1498		1845	3689		1845	3661	
Flt Permitted	0.75	1.00			0.95		0.38	1.00		0.30	1.00	
Satd. Flow (perm)	1475	1667			1431		740	3689		577	3661	
Peak-hour factor, PHF	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	36	0	51	1	0	7	39	948	1	19	676	36
RTOR Reduction (vph)	0	48	0	0	8	0	0	0	0	0	3	0
Lane Group Flow (vph)	36	3	0	0	0	0	39	949	0	19	709	0
Heavy Vehicles (%)	2%	2%	2%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.0	7.0			7.0		100.2	100.2		100.2	100.2	
Effective Green, g (s)	7.0	7.0			7.0		100.2	100.2		100.2	100.2	
Actuated g/C Ratio	0.06	0.06			0.06		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	86	98			84		623	3106		485	3082	
v/s Ratio Prot		0.00						c0.26			0.19	
v/s Ratio Perm	c0.02				0.00		0.05			0.03		
v/c Ratio	0.42	0.03			0.01		0.06	0.31		0.04	0.23	
Uniform Delay, d1	54.0	52.8			52.7		1.6	2.0		1.5	1.8	
Progression Factor	1.00	1.00			1.00		0.07	0.07		1.00	1.00	
Incremental Delay, d2	3.3	0.1			0.0		0.2	0.2		0.2	0.2	
Delay (s)	57.3	52.9			52.7		0.3	0.3		1.7	2.0	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		54.7			52.7			0.3			2.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	567	58	348	0	407	0	0	711	105
Future Volume (vph)	0	0	0	567	58	348	0	407	0	0	711	105
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3544	1923	2877		5353			5301	1650
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3544	1923	2877		5353			5301	1650
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	718	73	441	0	502	0	0	748	111
RTOR Reduction (vph)	0	0	0	0	0	270	0	0	0	0	0	31
Lane Group Flow (vph)	0	0	0	718	73	171	0	502	0	0	748	80
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				25.0	25.0	52.0		69.7			96.7	96.7
Effective Green, g (s)				25.0	25.0	52.0		69.7			96.7	96.7
Actuated g/C Ratio				0.19	0.19	0.39		0.52			0.72	0.72
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				661	358	1116		2784			3825	1190
v/s Ratio Prot				c0.20	0.04	0.06		0.09			c0.14	0.05
v/s Ratio Perm												
v/c Ratio				1.09	0.20	0.15		0.18			0.20	0.07
Uniform Delay, d1				54.5	46.1	26.7		17.0			6.0	5.5
Progression Factor				1.00	1.00	1.00		1.06			0.79	0.42
Incremental Delay, d2				60.7	0.3	0.1		0.1			0.1	0.1
Delay (s)				115.2	46.4	26.7		18.2			4.9	2.4
Level of Service				F	D	C		B			A	A
Approach Delay (s)		0.0			79.5			18.2			4.6	
Approach LOS		A			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	166	0	492	960	0
Future Volume (vph)	63	166	0	492	960	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.91	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3373	1502		3725	3689	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3373	1502		3725	3689	
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.86	0.86
Adj. Flow (vph)	69	182	0	553	1116	0
RTOR Reduction (vph)	85	85	0	0	0	0
Lane Group Flow (vph)	75	6	0	553	1116	0
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	8.8	8.8		113.2	113.2	
Effective Green, g (s)	8.8	8.8		113.2	113.2	
Actuated g/C Ratio	0.07	0.07		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	221	98		3146	3116	
v/s Ratio Prot	c0.02	0.00		0.15	c0.30	
v/s Ratio Perm						
v/c Ratio	0.34	0.06		0.18	0.36	
Uniform Delay, d1	59.8	58.7		1.9	2.3	
Progression Factor	1.00	1.00		0.23	0.40	
Incremental Delay, d2	1.1	0.3		0.1	0.3	
Delay (s)	60.9	59.0		0.5	1.2	
Level of Service	E	E		A	A	
Approach Delay (s)	60.2			0.5	1.2	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1455	37	4	556	4	5
Future Volume (Veh/h)	1455	37	4	556	4	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.60	0.60
Hourly flow rate (vph)	1672	43	5	654	7	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.93	
vC, conflicting volume			1715		2030	858
vC1, stage 1 conf vol					1694	
vC2, stage 2 conf vol					337	
vCu, unblocked vol			1715		1963	858
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			366		130	300

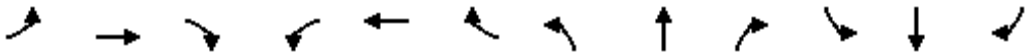
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1115	600	5	327	327	15
Volume Left	0	0	5	0	0	7
Volume Right	0	43	0	0	0	8
cSH	1700	1700	366	1700	1700	186
Volume to Capacity	0.66	0.35	0.01	0.19	0.19	0.08
Queue Length 95th (ft)	0	0	1	0	0	6
Control Delay (s)	0.0	0.0	15.0	0.0	0.0	26.0
Lane LOS			B			D
Approach Delay (s)	0.0		0.1			26.0
Approach LOS						D

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	787	6	0	419	0	3
Future Volume (Veh/h)	787	6	0	419	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	894	7	0	455	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.77		0.82	0.77
vC, conflicting volume			901		1352	450
vC1, stage 1 conf vol					898	
vC2, stage 2 conf vol					455	
vCu, unblocked vol			278		638	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			977		498	836

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	596	305	0	455	4
Volume Left	0	0	0	0	0
Volume Right	0	7	0	0	4
cSH	1700	1700	1700	1700	836
Volume to Capacity	0.35	0.18	0.00	0.27	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.3
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.3
Approach LOS					A

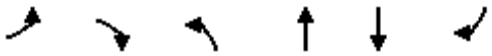
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	64	22	28	27	33	23	41	57	58	22	3
Future Volume (vph)	13	64	22	28	27	33	23	41	57	58	22	3
Peak Hour Factor	0.95	0.95	0.95	0.75	0.75	0.75	0.82	0.82	0.82	0.74	0.74	0.74
Hourly flow rate (vph)	14	67	23	37	36	44	28	50	70	78	30	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	14	90	37	80	28	120	78	34
Volume Left (vph)	14	0	37	0	28	0	78	0
Volume Right (vph)	0	23	0	44	0	70	0	4
Hadj (s)	0.53	-0.14	0.64	-0.25	0.57	-0.34	0.53	-0.05
Departure Headway (s)	5.8	5.1	5.9	5.0	5.7	4.8	5.7	5.2
Degree Utilization, x	0.02	0.13	0.06	0.11	0.04	0.16	0.12	0.05
Capacity (veh/h)	584	666	579	681	599	710	598	664
Control Delay (s)	7.7	7.7	8.1	7.4	7.8	7.6	8.3	7.2
Approach Delay (s)	7.7		7.6		7.6		8.0	
Approach LOS	A		A		A		A	

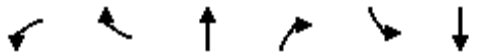
Intersection Summary				
Delay	7.7			
Level of Service	A			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	68	7	45	53	6	15
Future Volume (vph)	68	7	45	53	6	15
Peak Hour Factor	0.73	0.73	0.72	0.72	0.88	0.88
Hourly flow rate (vph)	93	10	63	74	7	17

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	93	10	63	74	24
Volume Left (vph)	93	0	63	0	0
Volume Right (vph)	0	10	0	0	17
Hadj (s)	0.53	-0.67	0.53	0.03	-0.39
Departure Headway (s)	5.4	4.2	5.3	4.8	4.4
Degree Utilization, x	0.14	0.01	0.09	0.10	0.03
Capacity (veh/h)	635	814	655	722	801
Control Delay (s)	8.1	6.1	7.7	7.2	7.5
Approach Delay (s)	7.9		7.4		7.5
Approach LOS	A		A		A

Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	4	818	23	20	594
Future Volume (Veh/h)	10	4	818	23	20	594
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	17	7	861	24	22	653
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.96					
vC, conflicting volume	1244	442			885	
vC1, stage 1 conf vol	873					
vC2, stage 2 conf vol	370					
vCu, unblocked vol	1168	442			885	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			97	
cM capacity (veh/h)	343	563			760	

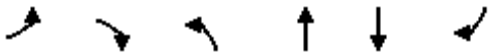
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	7	574	311	22	326	326
Volume Left	17	0	0	0	22	0	0
Volume Right	0	7	0	24	0	0	0
cSH	343	563	1700	1700	760	1700	1700
Volume to Capacity	0.05	0.01	0.34	0.18	0.03	0.19	0.19
Queue Length 95th (ft)	4	1	0	0	2	0	0
Control Delay (s)	16.0	11.5	0.0	0.0	9.9	0.0	0.0
Lane LOS	C	B			A		
Approach Delay (s)	14.7		0.0		0.3		
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	407	148	0	1278
Future Volume (Veh/h)	0	0	407	148	0	1278
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.81	0.81	0.95	0.95
Hourly flow rate (vph)	0	0	502	183	0	1345
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.96					
vC, conflicting volume	950	251			685	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	807	251			685	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	307	749			898	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	251	251	183	448	448	448
Volume Left	0	0	0	0	0	0
Volume Right	0	0	183	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.15	0.15	0.11	0.26	0.26	0.26
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	555	960	318
Future Volume (Veh/h)	0	0	0	555	960	318
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	0	624	1116	370
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.98	0.96	0.96			
vC, conflicting volume	1428	558	1486			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277	468	1430			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	154	522	454			

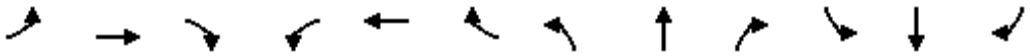
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	312	312	558	558	370
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	370
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.33	0.33	0.22
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	492	807	0	1126
Future Volume (Veh/h)	0	0	492	807	0	1126
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	553	907	0	1309
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.94					
vC, conflicting volume	989	276			1460	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	777	276			1460	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	314	721			454	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	276	276	907	436	436	436
Volume Left	0	0	0	0	0	0
Volume Right	0	0	907	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.16	0.53	0.26	0.26	0.26
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

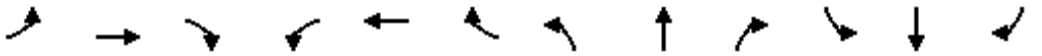
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	297	218	223	565	151	206	625	81	120	677	280
Future Volume (vph)	182	297	218	223	565	151	206	625	81	120	677	280
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3489		1863	3597		1863	3654		1862	3552	
Flt Permitted	0.19	1.00		0.21	1.00		0.10	1.00		0.21	1.00	
Satd. Flow (perm)	370	3489		418	3597		199	3654		416	3552	
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	204	334	245	240	608	162	226	687	89	126	713	295
RTOR Reduction (vph)	0	121	0	0	20	0	0	8	0	0	35	0
Lane Group Flow (vph)	204	458	0	240	750	0	226	768	0	126	973	0
Confl. Peds. (#/hr)	1					1			3	3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	34.1	21.2		48.9	29.4		54.7	42.4		54.7	42.4	
Effective Green, g (s)	34.1	21.2		48.9	29.4		54.7	42.4		54.7	42.4	
Actuated g/C Ratio	0.28	0.17		0.40	0.24		0.44	0.34		0.44	0.34	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	601		414	859		254	1259		329	1224	
v/s Ratio Prot	c0.08	0.13		c0.10	c0.21		c0.09	0.21		0.04	0.27	
v/s Ratio Perm	0.14			0.13			c0.31			0.13		
v/c Ratio	0.79	0.76		0.58	0.87		0.89	0.61		0.38	0.79	
Uniform Delay, d1	50.1	48.5		38.3	45.0		46.1	33.4		36.3	36.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.91	0.94	
Incremental Delay, d2	14.6	5.7		2.0	9.8		29.1	2.2		0.7	5.2	
Delay (s)	64.7	54.2		40.3	54.8		75.2	35.7		33.9	39.5	
Level of Service	E	D		D	D		E	D		C	D	
Approach Delay (s)		56.9			51.3			44.6			38.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

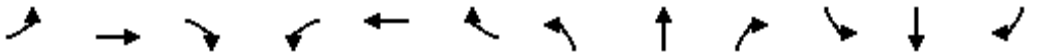
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	481	87	140	777	400	175	865	78	195	641	254
Future Volume (vph)	264	481	87	140	777	400	175	865	78	195	641	254
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3640		1863	3725	1667	1863	3679		1863	3567	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3640		1863	3725	1667	1863	3679		1863	3567	
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	300	547	99	152	845	435	190	940	85	205	675	267
RTOR Reduction (vph)	0	10	0	0	0	0	0	5	0	0	31	0
Lane Group Flow (vph)	300	636	0	152	845	435	190	1020	0	205	911	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	25.7	36.2		16.5	27.0	46.2	18.4	38.9		19.2	39.7	
Effective Green, g (s)	25.7	36.2		16.5	27.0	46.2	18.4	38.9		19.2	39.7	
Actuated g/C Ratio	0.19	0.27		0.12	0.20	0.34	0.14	0.29		0.14	0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	354	976		227	745	570	253	1060		264	1048	
v/s Ratio Prot	c0.16	0.17		0.08	c0.23	0.11	0.10	c0.28		c0.11	0.26	
v/s Ratio Perm						0.15						
v/c Ratio	0.85	0.65		0.67	1.13	0.76	0.75	0.96		0.78	0.87	
Uniform Delay, d1	52.8	43.8		56.6	54.0	39.5	56.1	47.3		55.8	45.2	
Progression Factor	1.00	1.00		1.09	1.03	0.85	0.91	0.84		1.10	1.02	
Incremental Delay, d2	17.0	3.4		6.9	75.6	5.7	11.1	18.1		11.9	6.9	
Delay (s)	69.8	47.2		68.8	131.3	39.2	62.2	58.1		73.3	52.9	
Level of Service	E	D		E	F	D	E	E		E	D	
Approach Delay (s)		54.4			96.7			58.7			56.6	
Approach LOS		D			F			E			E	

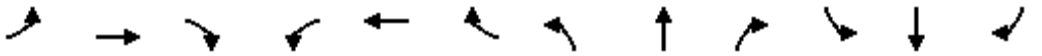
Intersection Summary			
HCM 2000 Control Delay	68.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	564	71	49	853	141	89	36	53	144	91	115
Future Volume (vph)	61	564	71	49	853	141	89	36	53	144	91	115
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3653		1862	1961	1619	1863	1961	1667	1863	1961	1667
Flt Permitted	0.15	1.00		0.36	1.00	1.00	0.58	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	297	3653		707	1961	1619	1142	1961	1667	1431	1961	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	66	606	76	52	898	148	105	42	62	164	103	131
RTOR Reduction (vph)	0	6	0	0	0	57	0	0	58	0	0	119
Lane Group Flow (vph)	66	676	0	52	898	91	105	42	4	164	103	12
Confl. Peds. (#/hr)	3		2	2		3						
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	88.3	83.3		88.3	83.3	83.3	19.1	9.2	9.2	25.5	12.4	12.4
Effective Green, g (s)	88.3	83.3		88.3	83.3	83.3	19.1	9.2	9.2	25.5	12.4	12.4
Actuated g/C Ratio	0.65	0.62		0.65	0.62	0.62	0.14	0.07	0.07	0.19	0.09	0.09
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	252	2254		505	1210	998	214	133	113	312	180	153
v/s Ratio Prot	c0.01	0.19		0.00	c0.46		0.04	0.02		c0.05	c0.05	
v/s Ratio Perm	0.16			0.06		0.06	0.03		0.00	0.05		0.01
v/c Ratio	0.26	0.30		0.10	0.74	0.09	0.49	0.32	0.04	0.53	0.57	0.08
Uniform Delay, d1	34.9	12.1		11.3	18.3	10.5	54.5	59.9	58.8	49.6	58.8	56.1
Progression Factor	0.86	0.90		0.26	0.40	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.0	2.1	0.1	1.8	1.4	0.1	1.6	4.3	0.2
Delay (s)	30.4	11.2		3.0	9.4	0.9	56.3	61.3	58.9	51.1	63.1	56.3
Level of Service	C	B		A	A	A	E	E	E	D	E	E
Approach Delay (s)		12.9			7.9			58.1			55.9	
Approach LOS		B			A			E			E	

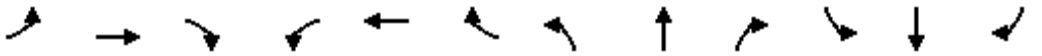
Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	25	412	354	49	43	360	695	211	10	921	58
Future Volume (vph)	56	25	412	354	49	43	360	695	211	10	921	58
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1823		3614	5353	1667	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1823		3614	5353	1667	1863	5353	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	59	26	434	385	53	47	396	764	232	11	969	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	101	0	0	34
Lane Group Flow (vph)	59	26	434	385	100	0	396	764	131	11	969	27
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	11.0	11.0	36.2	20.2	20.2		19.2	76.0	76.0	3.0	59.8	59.8
Effective Green, g (s)	11.0	11.0	36.2	20.2	20.2		19.2	76.0	76.0	3.0	59.8	59.8
Actuated g/C Ratio	0.08	0.08	0.27	0.15	0.15		0.14	0.56	0.56	0.02	0.44	0.44
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	151	159	786	540	272		513	3013	938	41	2371	738
v/s Ratio Prot	0.03	0.01	c0.15	c0.11	0.05		c0.11	0.14		0.01	c0.18	
v/s Ratio Perm									0.08			0.02
v/c Ratio	0.39	0.16	0.55	0.71	0.37		0.77	0.25	0.14	0.27	0.41	0.04
Uniform Delay, d1	58.8	57.7	42.4	54.6	51.7		55.8	15.0	14.0	64.9	25.6	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.70	0.69	2.03	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.5	0.8	4.6	1.0		6.7	0.2	0.3	3.5	0.5	0.1
Delay (s)	60.5	58.2	43.3	59.2	52.6		45.6	10.6	28.7	68.4	26.1	21.4
Level of Service	E	E	D	E	D		D	B	C	E	C	C
Approach Delay (s)		46.0			57.9			23.6			26.3	
Approach LOS		D			E			C			C	

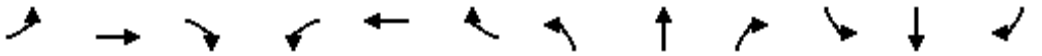
Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	409	202	68	787	97	190	208	43	162	368	128
Future Volume (vph)	85	409	202	68	787	97	190	208	43	162	368	128
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1633	1863	1961	1667	1863	1961	1667
Flt Permitted	0.07	1.00	1.00	0.37	1.00	1.00	0.13	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)	134	1961	1667	719	1961	1633	255	1961	1667	850	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	89	431	213	72	828	102	213	234	48	195	443	154
RTOR Reduction (vph)	0	0	91	0	0	48	0	0	35	0	0	74
Lane Group Flow (vph)	89	431	122	72	828	54	213	234	13	195	443	80
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	65.8	58.5	74.1	63.0	57.1	71.9	46.4	30.8	36.7	44.8	30.0	37.3
Effective Green, g (s)	65.8	58.5	74.1	63.0	57.1	71.9	46.4	30.8	36.7	44.8	30.0	37.3
Actuated g/C Ratio	0.49	0.43	0.55	0.47	0.42	0.53	0.34	0.23	0.27	0.33	0.22	0.28
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	158	849	914	385	829	869	273	447	453	393	435	460
v/s Ratio Prot	c0.03	0.22	0.02	0.01	c0.42	0.01	c0.09	0.12	0.00	0.05	c0.23	0.01
v/s Ratio Perm	0.24		0.06	0.08		0.03	0.18		0.01	0.11		0.04
v/c Ratio	0.56	0.51	0.13	0.19	1.00	0.06	0.78	0.52	0.03	0.50	1.02	0.17
Uniform Delay, d1	30.1	27.8	14.8	21.0	38.9	15.3	35.8	45.7	36.1	34.0	52.5	37.1
Progression Factor	1.40	0.81	1.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	2.1	0.1	0.2	31.0	0.0	13.4	1.3	0.0	1.0	47.9	0.2
Delay (s)	46.4	24.6	27.4	21.3	69.9	15.3	49.2	46.9	36.1	35.0	100.4	37.3
Level of Service	D	C	C	C	E	B	D	D	D	C	F	D
Approach Delay (s)		28.1			60.8			46.9			72.0	
Approach LOS		C			E			D			E	

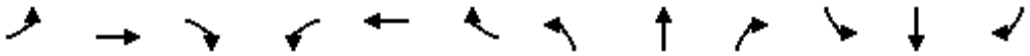
Intersection Summary			
HCM 2000 Control Delay	53.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	38	48	15	479	35	1270	60	419	1278	63
Future Volume (vph)	75	14	38	48	15	479	35	1270	60	419	1278	63
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3442	1667		1888	2933	1863	5317		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3442	1667		1888	2933	1863	5317		3614	3725	1667
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	93	17	47	56	17	557	39	1427	67	441	1345	66
RTOR Reduction (vph)	0	0	43	0	0	89	0	4	0	0	0	20
Lane Group Flow (vph)	46	64	4	0	73	468	39	1490	0	441	1345	46
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	6.0	6.0	12.8		8.6	41.5	6.8	62.7		32.9	88.8	94.8
Effective Green, g (s)	6.0	6.0	12.8		8.6	41.5	6.8	62.7		32.9	88.8	94.8
Actuated g/C Ratio	0.04	0.04	0.09		0.06	0.31	0.05	0.46		0.24	0.66	0.70
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	75	152	158		120	1040	93	2469		880	2450	1170
v/s Ratio Prot	c0.03	0.02	0.00		c0.04	0.11	0.02	c0.28		0.12	c0.36	0.00
v/s Ratio Perm			0.00			0.05						0.03
v/c Ratio	0.61	0.42	0.03		0.61	0.45	0.42	0.60		0.50	0.55	0.04
Uniform Delay, d1	63.4	62.8	55.5		61.6	37.6	62.2	26.9		44.0	12.4	6.2
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.16	0.70		0.91	0.80	1.46
Incremental Delay, d2	14.0	1.9	0.1		9.7	0.4	1.6	0.6		0.5	0.8	0.0
Delay (s)	77.3	64.7	55.5		71.3	37.9	73.5	19.3		40.6	10.7	9.0
Level of Service	E	E	E		E	D	E	B		D	B	A
Approach Delay (s)		65.6			41.8			20.7			17.8	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

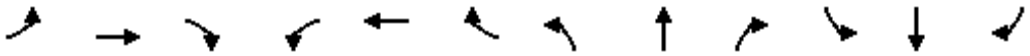
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	27	70	4	33	66	1047	50	53	762	11
Future Volume (vph)	17	1	27	70	4	33	66	1047	50	53	762	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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		0.92		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769		1863	1961	1667	1863	3700		1863	3718	
Flt Permitted		0.87		0.69	1.00	1.00	0.31	1.00		0.20	1.00	
Satd. Flow (perm)		1576		1362	1961	1667	611	3700		391	3718	
Peak-hour factor, PHF	0.60	0.60	0.60	0.72	0.72	0.72	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	28	2	45	97	6	46	73	1151	55	58	837	12
RTOR Reduction (vph)	0	40	0	0	0	41	0	2	0	0	1	0
Lane Group Flow (vph)	0	35	0	97	6	5	73	1204	0	58	848	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.6		14.6	14.6	14.6	102.4	97.8		102.4	97.8	
Effective Green, g (s)		14.6		14.6	14.6	14.6	102.4	97.8		102.4	97.8	
Actuated g/C Ratio		0.11		0.11	0.11	0.11	0.76	0.72		0.76	0.72	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170		147	212	180	506	2680		346	2693	
v/s Ratio Prot					0.00		0.00	c0.33		c0.01	0.23	
v/s Ratio Perm		0.02		c0.07		0.00	0.10			0.12		
v/c Ratio		0.21		0.66	0.03	0.03	0.14	0.45		0.17	0.32	
Uniform Delay, d1		54.9		57.8	53.9	53.9	6.3	7.6		9.3	6.6	
Progression Factor		1.01		1.00	1.00	1.00	1.00	1.00		0.71	0.80	
Incremental Delay, d2		0.6		10.2	0.1	0.1	0.1	0.5		0.1	0.2	
Delay (s)		56.1		68.1	53.9	53.9	6.4	8.1		6.7	5.5	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		56.1			63.1			8.0			5.6	
Approach LOS		E			E			A			A	

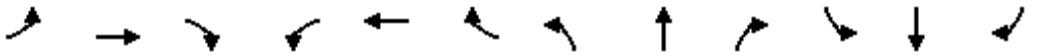
Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	0	57	7	0	34	41	1051	2	2	955	53
Future Volume (vph)	38	0	57	7	0	34	41	1051	2	2	955	53
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1601		1863	3725		1863	3696	
Flt Permitted	0.86	1.00			0.92		0.26	1.00		0.23	1.00	
Satd. Flow (perm)	1688	1667			1489		513	3725		454	3696	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	49	0	74	9	0	43	46	1168	2	2	1005	56
RTOR Reduction (vph)	0	69	0	0	40	0	0	0	0	0	2	0
Lane Group Flow (vph)	49	5	0	0	12	0	46	1170	0	2	1059	0
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	8.0	8.0			8.0		103.2	103.2		103.2	103.2	
Effective Green, g (s)	8.0	8.0			8.0		103.2	103.2		103.2	103.2	
Actuated g/C Ratio	0.07	0.07			0.07		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	108			96		430	3125		380	3101	
v/s Ratio Prot		0.00						c0.31			0.29	
v/s Ratio Perm	c0.03				0.01		0.09			0.00		
v/c Ratio	0.45	0.04			0.12		0.11	0.37		0.01	0.34	
Uniform Delay, d1	55.4	53.9			54.2		1.8	2.3		1.6	2.2	
Progression Factor	1.00	1.00			1.00		0.13	0.10		1.00	1.00	
Incremental Delay, d2	2.9	0.2			0.6		0.4	0.3		0.0	0.3	
Delay (s)	58.3	54.1			54.8		0.6	0.5		1.6	2.5	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		55.8			54.8			0.5			2.5	
Approach LOS		E			D			A			A	

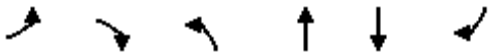
Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	506	397	332	0	1082	0	0	1301	456
Future Volume (vph)	0	0	0	506	397	332	0	1082	0	0	1301	456
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	533	418	349	0	1163	0	0	1369	480
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	0	15
Lane Group Flow (vph)	0	0	0	533	418	289	0	1163	0	0	1369	465
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				25.0	25.0	52.0		70.7			97.7	97.7
Effective Green, g (s)				25.0	25.0	52.0		70.7			97.7	97.7
Actuated g/C Ratio				0.19	0.19	0.39		0.52			0.72	0.72
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				669	363	1129		2803			3873	1206
v/s Ratio Prot				0.15	c0.21	0.10		c0.22			0.26	c0.28
v/s Ratio Perm												
v/c Ratio				0.80	1.15	0.26		0.41			0.35	0.39
Uniform Delay, d1				52.6	55.0	28.3		19.6			6.9	7.1
Progression Factor				1.00	1.00	1.00		0.93			0.50	0.44
Incremental Delay, d2				6.6	95.2	0.1		0.4			0.2	0.8
Delay (s)				59.1	150.2	28.4		18.6			3.7	4.0
Level of Service				E	F	C		B			A	A
Approach Delay (s)		0.0			80.2			18.6			3.8	
Approach LOS		A			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	271	322	0	1213	1437	0
Future Volume (vph)	271	322	0	1213	1437	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3497	1517		3725	3725	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3497	1517		3725	3725	
Peak-hour factor, PHF	0.94	0.94	0.86	0.86	0.94	0.94
Adj. Flow (vph)	288	343	0	1410	1529	0
RTOR Reduction (vph)	49	49	0	0	0	0
Lane Group Flow (vph)	383	150	0	1410	1529	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	21.3	21.3		101.7	101.7	
Effective Green, g (s)	21.3	21.3		101.7	101.7	
Actuated g/C Ratio	0.16	0.16		0.75	0.75	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	551	239		2806	2806	
v/s Ratio Prot	c0.11	0.10		0.38	c0.41	
v/s Ratio Perm						
v/c Ratio	0.70	0.63		0.50	0.54	
Uniform Delay, d1	53.8	53.1		6.6	7.0	
Progression Factor	1.00	1.00		0.39	0.48	
Incremental Delay, d2	3.9	5.3		0.5	0.7	
Delay (s)	57.7	58.5		3.1	4.0	
Level of Service	E	E		A	A	
Approach Delay (s)	58.0			3.1	4.0	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	817	18	7	1199	15	15
Future Volume (Veh/h)	817	18	7	1199	15	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.63	0.63
Hourly flow rate (vph)	928	20	8	1303	24	24
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.80	
vC, conflicting volume			948		1606	474
vC1, stage 1 conf vol					938	
vC2, stage 2 conf vol					668	
vCu, unblocked vol			948		1266	474
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	96
cM capacity (veh/h)			720		315	537

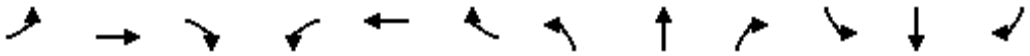
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	619	329	8	652	652	48
Volume Left	0	0	8	0	0	24
Volume Right	0	20	0	0	0	24
cSH	1700	1700	720	1700	1700	397
Volume to Capacity	0.36	0.19	0.01	0.38	0.38	0.12
Queue Length 95th (ft)	0	0	1	0	0	10
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.3
Lane LOS			B			C
Approach Delay (s)	0.0		0.1			15.3
Approach LOS						C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	701	3	14	839	5	2
Future Volume (Veh/h)	701	3	14	839	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.88	0.88
Hourly flow rate (vph)	738	3	15	883	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.88		0.71	0.88
vC, conflicting volume			741		1652	370
vC1, stage 1 conf vol					740	
vC2, stage 2 conf vol					913	
vCu, unblocked vol			428		1071	7
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	100
cM capacity (veh/h)			990		299	943

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	492	249	15	883	8
Volume Left	0	0	15	0	6
Volume Right	0	3	0	0	2
cSH	1700	1700	990	1700	361
Volume to Capacity	0.29	0.15	0.02	0.52	0.02
Queue Length 95th (ft)	0	0	1	0	2
Control Delay (s)	0.0	0.0	8.7	0.0	15.2
Lane LOS			A		C
Approach Delay (s)	0.0		0.1		15.2
Approach LOS					C

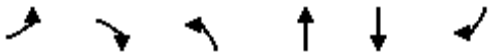
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	70	127	140	145	157	105	72	20	34	90	9
Future Volume (vph)	4	70	127	140	145	157	105	72	20	34	90	9
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90
Hourly flow rate (vph)	5	80	146	173	179	194	122	84	23	38	100	10

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	5	226	173	373	122	107	38	110
Volume Left (vph)	5	0	173	0	122	0	38	0
Volume Right (vph)	0	146	0	194	0	23	0	10
Hadj (s)	0.53	-0.42	0.53	-0.33	0.53	-0.12	0.53	-0.03
Departure Headway (s)	7.0	6.0	6.5	5.7	7.3	6.6	7.4	6.8
Degree Utilization, x	0.01	0.38	0.31	0.59	0.25	0.20	0.08	0.21
Capacity (veh/h)	485	570	531	618	466	508	449	487
Control Delay (s)	8.8	11.4	11.3	15.3	11.4	10.0	9.8	10.4
Approach Delay (s)	11.3		14.0		10.8		10.3	
Approach LOS	B		B		B		B	

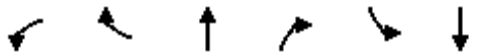
Intersection Summary				
Delay	12.4			
Level of Service	B			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	106	23	20	28	41	109
Future Volume (vph)	106	23	20	28	41	109
Peak Hour Factor	0.95	0.95	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	112	24	23	33	45	118

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	112	24	23	33	163
Volume Left (vph)	112	0	23	0	0
Volume Right (vph)	0	24	0	0	118
Hadj (s)	0.53	-0.67	0.57	0.07	-0.40
Departure Headway (s)	5.5	4.3	5.6	5.1	4.3
Degree Utilization, x	0.17	0.03	0.04	0.05	0.20
Capacity (veh/h)	619	787	620	679	795
Control Delay (s)	8.5	6.3	7.6	7.1	8.4
Approach Delay (s)	8.1		7.3		8.4
Approach LOS	A		A		A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	13	1023	21	3	1000
Future Volume (Veh/h)	22	13	1023	21	3	1000
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	25	15	1124	23	3	1053
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.92					
vC, conflicting volume	1668	574			1147	
vC1, stage 1 conf vol	1136					
vC2, stage 2 conf vol	532					
vCu, unblocked vol	1548	574			1147	
tC, single (s)	6.9	7.0			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.2	
p0 queue free %	90	97			100	
cM capacity (veh/h)	243	451			605	

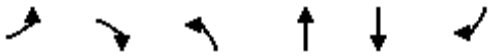
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	15	749	398	3	526	526
Volume Left	25	0	0	0	3	0	0
Volume Right	0	15	0	23	0	0	0
cSH	243	451	1700	1700	605	1700	1700
Volume to Capacity	0.10	0.03	0.44	0.23	0.00	0.31	0.31
Queue Length 95th (ft)	8	3	0	0	0	0	0
Control Delay (s)	21.5	13.3	0.0	0.0	11.0	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	18.4		0.0		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1082	402	0	1807
Future Volume (Veh/h)	0	0	1082	402	0	1807
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	0	1163	432	0	1902
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.93	0.88			0.88	
vC, conflicting volume	1797	582			1595	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1091	264			1410	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	195	649			424	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	582	582	432	634	634	634
Volume Left	0	0	0	0	0	0
Volume Right	0	0	432	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.34	0.25	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1484	1437	370
Future Volume (Veh/h)	0	0	0	1484	1437	370
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	0	1726	1529	394
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.90	0.89	0.89			
vC, conflicting volume	2392	764	1923			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1763	484	1788			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	68	470	304			

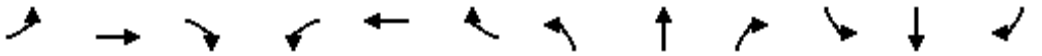
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	863	863	764	764	394
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	394
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.51	0.51	0.45	0.45	0.23
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	60.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1213	582	0	1759
Future Volume (Veh/h)	0	0	1213	582	0	1759
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	1410	677	0	1871
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.87	0.79			0.79	
vC, conflicting volume	2034	705			2087	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	774	98			1845	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	292	743			257	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	705	705	677	624	624	624
Volume Left	0	0	0	0	0	0
Volume Right	0	0	677	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.40	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

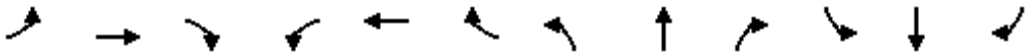
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	273	100	99	281	147	146	516	89	127	498	255
Future Volume (vph)	219	273	100	99	281	147	146	516	89	127	498	255
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3575		1863	3534		1863	3643		1863	3536	
Flt Permitted	0.27	1.00		0.31	1.00		0.22	1.00		0.31	1.00	
Satd. Flow (perm)	534	3575		617	3534		440	3643		616	3536	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	249	310	114	105	299	156	162	573	99	143	560	287
RTOR Reduction (vph)	0	38	0	0	67	0	0	11	0	0	51	0
Lane Group Flow (vph)	249	386	0	105	388	0	162	661	0	143	796	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.6	16.9		31.0	17.1		52.2	44.9		52.2	44.9	
Effective Green, g (s)	30.6	16.9		31.0	17.1		52.2	44.9		52.2	44.9	
Actuated g/C Ratio	0.28	0.16		0.28	0.16		0.48	0.41		0.48	0.41	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	316	554		334	554		306	1500		378	1456	
v/s Ratio Prot	c0.10	0.11		0.04	0.11		c0.04	0.18		0.03	c0.23	
v/s Ratio Perm	c0.12			0.05			0.22			0.16		
v/c Ratio	0.79	0.70		0.31	0.70		0.53	0.44		0.38	0.55	
Uniform Delay, d1	40.1	43.6		36.6	43.5		31.2	23.0		24.5	24.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.90	0.93	
Incremental Delay, d2	12.2	3.8		0.5	3.9		1.7	0.9		0.6	1.4	
Delay (s)	52.3	47.4		37.1	47.4		32.8	24.0		22.8	24.1	
Level of Service	D	D		D	D		C	C		C	C	
Approach Delay (s)		49.2			45.5			25.7			23.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

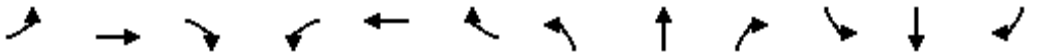
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	403	58	157	487	422	90	719	73	232	654	313
Future Volume (vph)	348	403	58	157	487	422	90	719	73	232	654	313
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3656		1863	3725	1667	1863	3674		1863	3545	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3656		1863	3725	1667	1863	3674		1863	3545	
Peak-hour factor, PHF	0.78	0.78	0.78	0.93	0.93	0.93	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	446	517	74	169	524	454	101	808	82	258	727	348
RTOR Reduction (vph)	0	7	0	0	0	0	0	6	0	0	42	0
Lane Group Flow (vph)	446	584	0	169	524	454	101	884	0	258	1033	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	28.0	35.4		17.4	24.8	43.7	12.7	36.1		18.9	42.3	
Effective Green, g (s)	28.0	35.4		17.4	24.8	43.7	12.7	36.1		18.9	42.3	
Actuated g/C Ratio	0.21	0.27		0.13	0.19	0.33	0.10	0.27		0.14	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	395	980		245	699	551	179	1004		266	1136	
v/s Ratio Prot	c0.24	0.16		0.09	0.14	c0.12	0.05	0.24		c0.14	c0.29	
v/s Ratio Perm						0.15						
v/c Ratio	1.13	0.60		0.69	0.75	0.82	0.56	0.88		0.97	0.91	
Uniform Delay, d1	52.0	42.1		54.7	50.7	40.6	57.0	45.9		56.3	43.0	
Progression Factor	1.00	1.00		0.92	1.17	1.12	1.19	0.83		0.90	0.69	
Incremental Delay, d2	85.3	2.7		7.5	6.9	9.3	3.9	8.7		42.9	9.5	
Delay (s)	137.3	44.7		57.7	66.2	54.9	71.5	46.9		93.3	39.0	
Level of Service	F	D		E	E	D	E	D		F	D	
Approach Delay (s)		84.5			60.5			49.4			49.5	
Approach LOS		F			E			D			D	

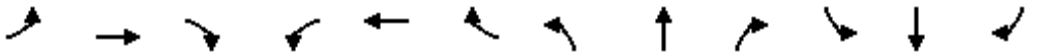
Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	586	57	28	632	156	91	36	53	161	34	52
Future Volume (vph)	40	586	57	28	632	156	91	36	53	161	34	52
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3669		1862	1961	1667	1863	1961	1635	1854	1961	1667
Flt Permitted	0.30	1.00		0.37	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	582	3669		731	1961	1667	1431	1961	1635	1425	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	42	617	60	31	695	171	103	41	60	199	42	64
RTOR Reduction (vph)	0	5	0	0	0	60	0	0	57	0	0	61
Lane Group Flow (vph)	42	672	0	31	695	111	103	41	3	199	42	3
Confl. Peds. (#/hr)			1	1					4	4		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	93.8	88.1		89.2	85.8	85.8	16.1	7.1	7.1	16.1	7.1	7.1
Effective Green, g (s)	93.8	88.1		89.2	85.8	85.8	16.1	7.1	7.1	16.1	7.1	7.1
Actuated g/C Ratio	0.71	0.67		0.68	0.65	0.65	0.12	0.05	0.05	0.12	0.05	0.05
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	468	2448		523	1274	1083	203	105	87	203	105	89
v/s Ratio Prot	c0.00	0.18		0.00	c0.35		0.03	0.02		c0.07	0.02	
v/s Ratio Perm	0.06			0.04		0.07	0.03		0.00	c0.05		0.00
v/c Ratio	0.09	0.27		0.06	0.55	0.10	0.51	0.39	0.04	0.98	0.40	0.04
Uniform Delay, d1	14.9	8.9		8.9	12.5	8.7	54.2	60.4	59.2	56.4	60.4	59.2
Progression Factor	0.27	0.26		0.24	0.27	0.05	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.0	1.3	0.1	2.0	2.4	0.2	57.3	2.5	0.2
Delay (s)	4.1	2.6		2.2	4.7	0.6	56.1	62.8	59.4	113.7	62.9	59.4
Level of Service	A	A		A	A	A	E	E	E	F	E	E
Approach Delay (s)		2.6			3.8			58.4			95.3	
Approach LOS		A			A			E			F	

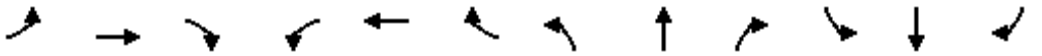
Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	120	740	646	146	39	680	782	488	23	1049	74
Future Volume (vph)	112	120	740	646	146	39	680	782	488	23	1049	74
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	128	787	710	160	43	716	823	514	24	1104	78
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	256	0	0	51
Lane Group Flow (vph)	119	128	787	710	203	0	716	823	258	24	1104	27
Confl. Peds. (#/hr)						2						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.0	12.0	42.6	25.0	25.0		24.6	66.2	66.2	4.0	45.6	45.6
Effective Green, g (s)	12.0	12.0	42.6	25.0	25.0		24.6	66.2	66.2	4.0	45.6	45.6
Actuated g/C Ratio	0.09	0.09	0.32	0.19	0.19		0.19	0.50	0.50	0.03	0.35	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	178	946	684	357		673	2684	836	56	1849	567
v/s Ratio Prot	0.06	0.07	c0.27	c0.20	0.11		c0.20	0.15		0.01	c0.21	
v/s Ratio Perm									0.15			0.02
v/c Ratio	0.70	0.72	0.83	1.04	0.57		1.06	0.31	0.31	0.43	0.60	0.05
Uniform Delay, d1	58.3	58.4	41.4	53.5	48.6		53.7	19.4	19.4	62.9	35.6	28.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.09	0.63	0.30	1.00	1.00	1.00
Incremental Delay, d2	12.5	13.0	6.3	44.6	2.3		46.9	0.2	0.6	5.2	1.4	0.2
Delay (s)	70.8	71.4	47.7	98.1	50.9		105.4	12.5	6.6	68.1	37.1	28.9
Level of Service	E	E	D	F	D		F	B	A	E	D	C
Approach Delay (s)		53.3			87.6			43.4			37.1	
Approach LOS		D			F			D			D	

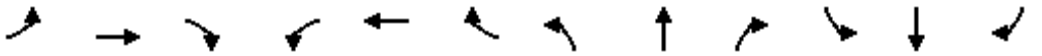
Intersection Summary					
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8		
Intersection Capacity Utilization	87.6%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	485	173	42	620	97	177	186	37	84	213	79
Future Volume (vph)	76	485	173	42	620	97	177	186	37	84	213	79
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1630	1863	1961	1667	1863	1961	1667
Flt Permitted	0.20	1.00	1.00	0.33	1.00	1.00	0.26	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	388	1961	1667	644	1961	1630	512	1961	1667	1006	1961	1667
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	84	533	190	46	681	107	188	198	39	95	242	90
RTOR Reduction (vph)	0	0	74	0	0	45	0	0	30	0	0	71
Lane Group Flow (vph)	84	533	116	46	681	62	188	198	9	95	242	19
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	72.9	67.4	80.8	70.7	66.3	76.6	38.3	24.9	29.3	32.1	21.8	27.3
Effective Green, g (s)	72.9	67.4	80.8	70.7	66.3	76.6	38.3	24.9	29.3	32.1	21.8	27.3
Actuated g/C Ratio	0.55	0.51	0.61	0.54	0.50	0.58	0.29	0.19	0.22	0.24	0.17	0.21
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	275	1001	1020	385	984	945	285	369	370	311	323	344
v/s Ratio Prot	c0.01	0.27	0.01	0.00	c0.35	0.01	c0.07	0.10	0.00	0.02	c0.12	0.00
v/s Ratio Perm	0.16		0.06	0.06		0.03	c0.12		0.00	0.05		0.01
v/c Ratio	0.31	0.53	0.11	0.12	0.69	0.07	0.66	0.54	0.02	0.31	0.75	0.05
Uniform Delay, d1	18.9	21.7	10.7	16.1	25.1	12.1	37.9	48.3	40.2	39.9	52.5	42.0
Progression Factor	0.84	0.99	1.54	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.9	0.0	0.1	4.0	0.0	5.4	1.7	0.0	0.6	9.5	0.1
Delay (s)	16.5	23.3	16.5	16.3	29.1	12.1	43.3	50.0	40.2	40.5	62.0	42.1
Level of Service	B	C	B	B	C	B	D	D	D	D	E	D
Approach Delay (s)		21.0			26.2			46.2			53.0	
Approach LOS		C			C			D			D	

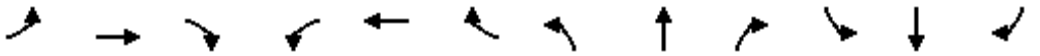
Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	27	56	71	9	568	38	1436	85	597	1175	103
Future Volume (vph)	109	27	56	71	9	568	38	1436	85	597	1175	103
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3454	1667		1878	2933	1863	5308		3614	3725	1667
Flt Permitted	0.95	0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3454	1667		1878	2933	1863	5308		3614	3725	1667
Peak-hour factor, PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	33	67	76	10	604	40	1512	89	628	1237	108
RTOR Reduction (vph)	0	0	60	0	0	86	0	5	0	0	0	34
Lane Group Flow (vph)	65	99	7	0	86	518	40	1596	0	628	1237	74
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	7.7	7.7	14.5		10.3	45.2	6.8	54.3		34.9	82.4	90.1
Effective Green, g (s)	7.7	7.7	14.5		10.3	45.2	6.8	54.3		34.9	82.4	90.1
Actuated g/C Ratio	0.06	0.06	0.11		0.08	0.34	0.05	0.41		0.26	0.62	0.68
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	98	201	183		146	1146	95	2183		955	2325	1137
v/s Ratio Prot	c0.04	0.03	0.00		c0.05	0.12	0.02	c0.30		c0.17	0.33	0.00
v/s Ratio Perm			0.00			0.06						0.04
v/c Ratio	0.66	0.49	0.04		0.59	0.45	0.42	0.73		0.66	0.53	0.06
Uniform Delay, d1	60.9	60.3	52.5		58.8	33.8	60.7	32.7		43.2	14.0	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.90	1.06		0.86	0.60	0.33
Incremental Delay, d2	15.6	1.9	0.1		7.0	0.3	1.4	1.0		1.1	0.6	0.0
Delay (s)	76.5	62.2	52.6		65.8	34.1	56.3	35.7		38.2	8.9	2.3
Level of Service	E	E	D		E	C	E	D		D	A	A
Approach Delay (s)		63.4			38.1			36.2			17.9	
Approach LOS		E			D			D			B	

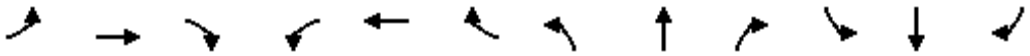
Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



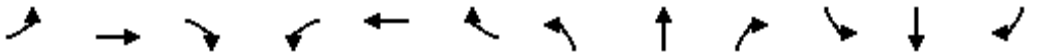
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	3	31	54	5	48	38	912	97	72	805	25
Future Volume (vph)	49	3	31	54	5	48	38	912	97	72	805	25
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		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	
Frpb, ped/bikes		1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806		1863	1961	1643	1863	3672		1863	3709	
Flt Permitted		0.81		0.65	1.00	1.00	0.30	1.00		0.23	1.00	
Satd. Flow (perm)		1515		1274	1961	1643	595	3672		459	3709	
Peak-hour factor, PHF	0.74	0.74	0.74	0.72	0.72	0.72	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	66	4	42	75	7	67	41	981	104	76	847	26
RTOR Reduction (vph)	0	19	0	0	0	60	0	4	0	0	1	0
Lane Group Flow (vph)	0	93	0	75	7	7	41	1081	0	76	872	0
Confl. Peds. (#/hr)	1					1						
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		13.4		13.4	13.4	13.4	100.6	96.0		100.6	96.0	
Effective Green, g (s)		13.4		13.4	13.4	13.4	100.6	96.0		100.6	96.0	
Actuated g/C Ratio		0.10		0.10	0.10	0.10	0.76	0.73		0.76	0.73	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		153		129	199	166	497	2670		398	2697	
v/s Ratio Prot					0.00		0.00	c0.29		c0.01	0.24	
v/s Ratio Perm		c0.06		0.06		0.00	0.06			0.14		
v/c Ratio		0.61		0.58	0.04	0.04	0.08	0.40		0.19	0.32	
Uniform Delay, d1		56.8		56.6	53.5	53.5	5.8	7.0		7.9	6.4	
Progression Factor		1.09		1.00	1.00	1.00	1.00	1.00		0.16	0.21	
Incremental Delay, d2		6.7		6.5	0.1	0.1	0.1	0.5		0.1	0.2	
Delay (s)		68.7		63.1	53.5	53.6	5.8	7.4		1.4	1.5	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		68.7			58.4			7.4			1.5	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	0	62	0	0	1	59	978	1	7	841	52
Future Volume (vph)	42	0	62	0	0	1	59	978	1	7	841	52
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1696		1863	3725		1861	3693	
Flt Permitted	0.76	1.00			1.00		0.30	1.00		0.26	1.00	
Satd. Flow (perm)	1483	1667			1696		586	3725		515	3693	
Peak-hour factor, PHF	0.90	0.90	0.90	0.60	0.60	0.60	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	47	0	69	0	0	2	63	1052	1	7	885	55
RTOR Reduction (vph)	0	64	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	47	5	0	0	0	0	63	1053	0	7	937	0
Confl. Peds. (#/hr)									1	1		
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.8	7.8			7.8		89.4	89.4		89.4	89.4	
Effective Green, g (s)	7.8	7.8			7.8		89.4	89.4		89.4	89.4	
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.82		0.82	0.82	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	119			121		480	3055		422	3028	
v/s Ratio Prot		0.00			0.00			c0.28			0.25	
v/s Ratio Perm	c0.03						0.11			0.01		
v/c Ratio	0.44	0.04			0.00		0.13	0.34		0.02	0.31	
Uniform Delay, d1	48.5	47.1			47.0		2.0	2.5		1.8	2.4	
Progression Factor	1.00	1.00			1.00		0.18	0.16		1.00	1.00	
Incremental Delay, d2	2.9	0.1			0.0		0.5	0.3		0.1	0.3	
Delay (s)	51.5	47.3			47.0		0.9	0.7		1.9	2.6	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.0			47.0			0.7			2.6	
Approach LOS		D			D			A			A	

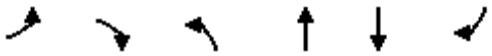
Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	615	170	985	0	1473	0	0	1782	467
Future Volume (vph)	0	0	0	615	170	985	0	1473	0	0	1782	467
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	699	193	1119	0	1551	0	0	1958	513
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	0	0	0	82
Lane Group Flow (vph)	0	0	0	699	193	1099	0	1551	0	0	1958	431
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				25.0	25.0	51.0		68.7			94.7	94.7
Effective Green, g (s)				25.0	25.0	51.0		68.7			94.7	94.7
Actuated g/C Ratio				0.19	0.19	0.39		0.52			0.72	0.72
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				684	371	1133		2785			3840	1195
v/s Ratio Prot				0.19	0.10	c0.37		c0.29			0.37	0.26
v/s Ratio Perm												
v/c Ratio				1.02	0.52	0.97		0.56			0.51	0.36
Uniform Delay, d1				53.5	48.1	39.7		21.4			8.3	7.1
Progression Factor				1.00	1.00	1.00		0.75			0.81	0.78
Incremental Delay, d2				40.1	1.3	19.6		0.6			0.3	0.5
Delay (s)				93.6	49.4	59.3		16.6			7.1	6.1
Level of Service				F	D	E		B			A	A
Approach Delay (s)		0.0			70.3			16.6			6.8	
Approach LOS		A			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	457	366	0	1480	1808	0
Future Volume (vph)	457	366	0	1480	1808	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3552	1517		3725	3725	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3552	1517		3725	3725	
Peak-hour factor, PHF	0.95	0.95	0.94	0.94	0.94	0.94
Adj. Flow (vph)	481	385	0	1574	1923	0
RTOR Reduction (vph)	17	18	0	0	0	0
Lane Group Flow (vph)	576	255	0	1574	1923	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	27.6	27.6		92.4	92.4	
Effective Green, g (s)	27.6	27.6		92.4	92.4	
Actuated g/C Ratio	0.21	0.21		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	742	317		2607	2607	
v/s Ratio Prot	0.16	c0.17		0.42	c0.52	
v/s Ratio Perm						
v/c Ratio	0.78	0.80		0.60	0.74	
Uniform Delay, d1	49.3	49.6		10.3	12.3	
Progression Factor	1.00	1.00		0.28	0.38	
Incremental Delay, d2	5.3	14.0		0.8	1.5	
Delay (s)	54.6	63.7		3.7	6.1	
Level of Service	D	E		A	A	
Approach Delay (s)	57.4			3.7	6.1	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	891	11	14	882	16	7
Future Volume (Veh/h)	891	11	14	882	16	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.87	0.87	0.82	0.82
Hourly flow rate (vph)	979	12	16	1014	20	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.87	
vC, conflicting volume			991		1524	496
vC1, stage 1 conf vol					985	
vC2, stage 2 conf vol					539	
vCu, unblocked vol			991		1300	496
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	98
cM capacity (veh/h)			693		301	520

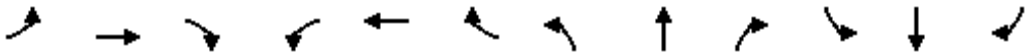
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	653	338	16	507	507	29
Volume Left	0	0	16	0	0	20
Volume Right	0	12	0	0	0	9
cSH	1700	1700	693	1700	1700	346
Volume to Capacity	0.38	0.20	0.02	0.30	0.30	0.08
Queue Length 95th (ft)	0	0	2	0	0	7
Control Delay (s)	0.0	0.0	10.3	0.0	0.0	16.4
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			16.4
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	662	3	1	910	2	3
Future Volume (Veh/h)	662	3	1	910	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.63	0.63
Hourly flow rate (vph)	697	3	1	958	3	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.90		0.79	0.90
vC, conflicting volume			700		1658	350
vC1, stage 1 conf vol					698	
vC2, stage 2 conf vol					960	
vCu, unblocked vol			456		1246	69
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			995		282	886

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	465	235	1	958	8
Volume Left	0	0	1	0	3
Volume Right	0	3	0	0	5
cSH	1700	1700	995	1700	491
Volume to Capacity	0.27	0.14	0.00	0.56	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	8.6	0.0	12.5
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		12.5
Approach LOS					B

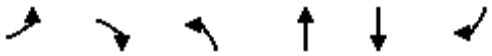
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	90	180	24	83	35	153	64	18	37	79	23
Future Volume (vph)	9	90	180	24	83	35	153	64	18	37	79	23
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.67	0.67	0.67
Hourly flow rate (vph)	9	95	189	25	87	37	178	74	21	55	118	34

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	9	284	25	124	178	95	55	152
Volume Left (vph)	9	0	25	0	178	0	55	0
Volume Right (vph)	0	189	0	37	0	21	0	34
Hadj (s)	0.53	-0.43	0.53	-0.17	0.53	-0.12	0.53	-0.12
Departure Headway (s)	6.6	5.6	6.8	6.1	6.6	5.9	6.7	6.0
Degree Utilization, x	0.02	0.44	0.05	0.21	0.32	0.16	0.10	0.25
Capacity (veh/h)	514	609	493	552	522	573	505	562
Control Delay (s)	8.5	11.9	8.9	9.5	11.5	8.8	9.2	9.8
Approach Delay (s)	11.8		9.4		10.5		9.7	
Approach LOS	B		A		B		A	

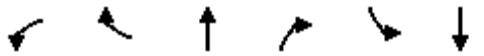
Intersection Summary				
Delay	10.6			
Level of Service	B			
Intersection Capacity Utilization	40.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	137	36	23	26	22	79
Future Volume (vph)	137	36	23	26	22	79
Peak Hour Factor	0.77	0.77	0.82	0.82	0.77	0.77
Hourly flow rate (vph)	178	47	28	32	29	103

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	178	47	28	32	132
Volume Left (vph)	178	0	28	0	0
Volume Right (vph)	0	47	0	0	103
Hadj (s)	0.53	-0.67	0.53	0.03	-0.43
Departure Headway (s)	5.5	4.3	5.8	5.3	4.6
Degree Utilization, x	0.27	0.06	0.04	0.05	0.17
Capacity (veh/h)	628	801	594	647	749
Control Delay (s)	9.3	6.4	7.8	7.3	8.5
Approach Delay (s)	8.7		7.6		8.5
Approach LOS	A		A		A

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	1	1041	14	2	877
Future Volume (Veh/h)	17	1	1041	14	2	877
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	28	2	1144	15	2	923
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.92					
vC, conflicting volume	1618	580			1160	
vC1, stage 1 conf vol	1152					
vC2, stage 2 conf vol	466					
vCu, unblocked vol	1496	580			1160	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	100			100	
cM capacity (veh/h)	248	457			597	

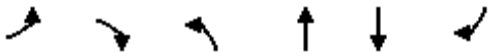
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	28	2	763	396	2	462	462
Volume Left	28	0	0	0	2	0	0
Volume Right	0	2	0	15	0	0	0
cSH	248	457	1700	1700	597	1700	1700
Volume to Capacity	0.11	0.00	0.45	0.23	0.00	0.27	0.27
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	21.3	12.9	0.0	0.0	11.0	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	20.8		0.0		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1473	464	0	2397
Future Volume (Veh/h)	0	0	1473	464	0	2397
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	0	0	1551	488	0	2634
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.88	0.80			0.80	
vC, conflicting volume	2429	776			2039	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1206	208			1794	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	155	636			271	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	776	776	488	878	878	878
Volume Left	0	0	0	0	0	0
Volume Right	0	0	488	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.46	0.29	0.52	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1937	1808	589
Future Volume (Veh/h)	0	0	0	1937	1808	589
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	2061	1923	627
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.86	0.82	0.82			
vC, conflicting volume	2954	962	2550			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1981	500	2448			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	46	421	153			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1030	1030	962	962	627
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	627
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.61	0.61	0.57	0.57	0.37
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

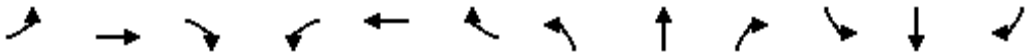
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1480	769	0	2174
Future Volume (Veh/h)	0	0	1480	769	0	2174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	1574	818	0	2313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.81	0.75			0.75	
vC, conflicting volume	2345	787			2392	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229	40			2187	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	602	764			179	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	787	787	818	771	771	771
Volume Left	0	0	0	0	0	0
Volume Right	0	0	818	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.46	0.48	0.45	0.45	0.45
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

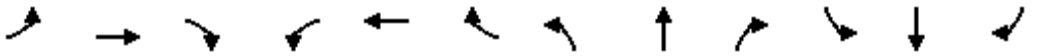
APPENDIX B-2. Existing (2018) Conditions (with Mitigation) Capacity Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	511	169	79	216	93	120	513	163	90	362	85
Future Volume (vph)	293	511	169	79	216	93	120	513	163	90	362	85
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3574		1776	3391		1844	3556		1863	3609	
Flt Permitted	0.42	1.00		0.26	1.00		0.42	1.00		0.27	1.00	
Satd. Flow (perm)	831	3574		482	3391		809	3556		537	3609	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	333	581	192	88	240	103	130	558	177	100	402	94
RTOR Reduction (vph)	0	30	0	0	52	0	0	22	0	0	15	0
Lane Group Flow (vph)	333	743	0	88	291	0	130	713	0	100	481	0
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	45.0	30.4		23.5	15.5		54.6	48.6		54.6	48.6	
Effective Green, g (s)	45.0	30.4		23.5	15.5		54.6	48.6		54.6	48.6	
Actuated g/C Ratio	0.38	0.26		0.20	0.13		0.46	0.41		0.46	0.41	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	512	913		182	441		423	1452		313	1473	
v/s Ratio Prot	c0.12	c0.21		0.03	0.09		0.02	c0.20		c0.02	0.13	
v/s Ratio Perm	0.12			0.06			0.13			0.13		
v/c Ratio	0.65	0.81		0.48	0.66		0.31	0.49		0.32	0.33	
Uniform Delay, d1	33.5	41.6		50.1	49.2		24.0	26.0		29.1	24.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.92	0.94	
Incremental Delay, d2	3.0	5.6		2.0	3.6		0.4	1.2		0.6	0.6	
Delay (s)	36.4	47.3		52.1	52.8		24.4	27.2		27.4	23.3	
Level of Service	D	D		D	D		C	C		C	C	
Approach Delay (s)		44.0			52.6			26.8			24.0	
Approach LOS		D			D			C			C	

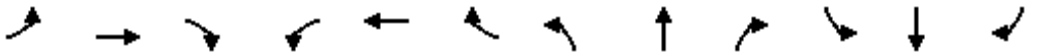
Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



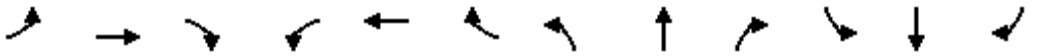
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	903	137	54	253	202	88	843	51	161	486	219
Future Volume (vph)	420	903	137	54	253	202	88	843	51	161	486	219
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1845	3617		1792	3585	1604	1845	3658		1845	3517	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1845	3617		1792	3585	1604	1845	3658		1845	3517	
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	483	1038	157	64	298	238	96	916	55	177	534	241
RTOR Reduction (vph)	0	9	0	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	483	1186	0	64	298	238	96	968	0	177	737	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	37.5	49.3		7.7	19.5	35.4	11.7	36.9		15.9	41.1	
Effective Green, g (s)	37.5	49.3		7.7	19.5	35.4	11.7	36.9		15.9	41.1	
Actuated g/C Ratio	0.28	0.37		0.06	0.15	0.26	0.09	0.28		0.12	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	516	1330		102	521	423	161	1007		218	1078	
v/s Ratio Prot	c0.26	c0.33		0.04	0.08	0.07	0.05	c0.26		c0.10	c0.21	
v/s Ratio Perm						0.08						
v/c Ratio	0.94	0.89		0.63	0.57	0.56	0.60	0.96		0.81	0.68	
Uniform Delay, d1	47.1	39.8		61.7	53.4	42.6	58.9	47.8		57.6	40.7	
Progression Factor	1.00	1.00		1.04	0.93	0.81	0.87	0.87		0.84	0.80	
Incremental Delay, d2	24.6	9.4		11.4	4.4	1.7	5.6	18.9		19.5	1.8	
Delay (s)	71.7	49.2		75.9	54.1	36.1	56.8	60.3		68.1	34.4	
Level of Service	E	D		E	D	D	E	E		E	C	
Approach Delay (s)		55.7			49.3			60.0			40.7	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



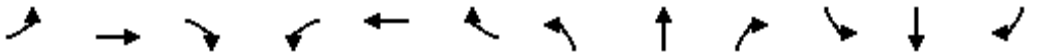
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	716	34	25	412	57	42	22	52	24	8	49
Future Volume (vph)	79	716	34	25	412	57	42	22	52	24	8	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	3629		1792	1887	1604	1841	1748	1650	1667	1754	1457
Flt Permitted	0.43	1.00		0.32	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	830	3629		595	1887	1604	1454	1748	1650	1300	1754	1457
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.70	0.70	0.70
Adj. Flow (vph)	87	787	37	29	485	67	48	25	59	34	11	70
RTOR Reduction (vph)	0	2	0	0	0	23	0	0	55	0	0	67
Lane Group Flow (vph)	87	822	0	29	485	44	48	25	4	34	11	3
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	14%	14%	14%
Parking (#/hr)								0				
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	101.5	93.3		92.1	88.6	88.6	14.7	8.5	8.5	10.9	6.6	6.6
Effective Green, g (s)	101.5	93.3		92.1	88.6	88.6	14.7	8.5	8.5	10.9	6.6	6.6
Actuated g/C Ratio	0.76	0.70		0.69	0.66	0.66	0.11	0.06	0.06	0.08	0.05	0.05
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	689	2526		440	1247	1060	177	110	104	117	86	71
v/s Ratio Prot	c0.01	0.23		0.00	c0.26		c0.01	0.01		0.01	0.01	
v/s Ratio Perm	0.09			0.04		0.03	c0.02		0.00	0.01		0.00
v/c Ratio	0.13	0.33		0.07	0.39	0.04	0.27	0.23	0.04	0.29	0.13	0.05
Uniform Delay, d1	7.6	8.0		9.2	10.4	7.9	54.9	59.6	58.9	58.1	60.9	60.7
Progression Factor	0.16	0.37		0.36	0.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		0.1	0.9	0.1	0.8	1.1	0.1	1.4	0.7	0.3
Delay (s)	1.3	3.1		3.4	6.3	8.0	55.7	60.7	59.0	59.4	61.6	61.0
Level of Service	A	A		A	A	A	E	E	E	E	E	E
Approach Delay (s)		2.9			6.4			58.2			60.6	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	78	31	2	3	77	432	89	1	671	14
Future Volume (vph)	5	2	78	31	2	3	77	432	89	1	671	14
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	7	3	107	45	3	4	97	547	113	1	808	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	6
Lane Group Flow (vph)	7	3	107	45	7	0	97	547	80	1	808	11
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	6.0	20.8	6.5	6.5		8.8	95.4	95.4	1.3	87.9	87.9
Effective Green, g (s)	6.0	6.0	20.8	6.5	6.5		8.8	95.4	95.4	1.3	87.9	87.9
Actuated g/C Ratio	0.04	0.04	0.16	0.05	0.05		0.07	0.71	0.71	0.01	0.66	0.66
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	85	442	161	79		235	3773	1174	18	3511	1093
v/s Ratio Prot	0.00	0.00	c0.04	c0.01	0.00		c0.03	0.10		0.00	c0.15	
v/s Ratio Perm									0.05			0.01
v/c Ratio	0.09	0.04	0.24	0.28	0.09		0.41	0.14	0.07	0.06	0.23	0.01
Uniform Delay, d1	61.4	61.2	49.7	61.5	60.9		60.1	6.2	5.8	65.7	9.3	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.18	0.57	0.29	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	1.1	0.6		1.2	0.1	0.1	1.3	0.2	0.0
Delay (s)	61.8	61.4	50.0	62.6	61.5		72.2	3.6	1.8	67.0	9.5	8.0
Level of Service	E	E	D	E	E		E	A	A	E	A	A
Approach Delay (s)		51.0			62.5			12.2			9.5	
Approach LOS		D			E			B			A	

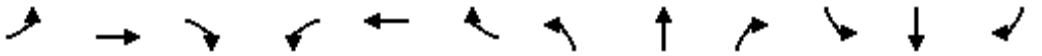
Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	538	61	20	304	193	126	258	85	119	119	57
Future Volume (vph)	107	538	61	20	304	193	126	258	85	119	119	57
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1845	1942	1650	1827	1923	1635	1860	1961	1667	1845	1942	1620
Flt Permitted	0.48	1.00	1.00	0.28	1.00	1.00	0.59	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	931	1942	1650	538	1923	1635	1150	1961	1667	503	1942	1620
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	115	578	66	22	342	217	133	272	89	140	140	67
RTOR Reduction (vph)	0	0	27	0	0	89	0	0	69	0	0	52
Lane Group Flow (vph)	115	578	39	22	342	128	133	272	20	140	140	15
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	72.7	67.2	78.9	72.7	67.2	79.2	36.0	24.3	29.8	36.6	24.6	30.1
Effective Green, g (s)	72.7	67.2	78.9	72.7	67.2	79.2	36.0	24.3	29.8	36.6	24.6	30.1
Actuated g/C Ratio	0.54	0.50	0.59	0.54	0.50	0.59	0.27	0.18	0.22	0.27	0.18	0.22
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	542	973	971	344	964	966	370	355	370	257	356	363
v/s Ratio Prot	c0.01	c0.30	0.00	0.00	0.18	0.01	0.03	c0.14	0.00	c0.05	0.07	0.00
v/s Ratio Perm	0.11		0.02	0.03		0.07	0.07		0.01	0.10		0.01
v/c Ratio	0.21	0.59	0.04	0.06	0.35	0.13	0.36	0.77	0.05	0.54	0.39	0.04
Uniform Delay, d1	15.3	23.7	11.6	16.6	20.3	12.2	38.6	52.1	41.0	39.1	48.1	40.7
Progression Factor	0.28	0.30	0.45	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.6	0.0	0.1	1.0	0.1	0.6	9.8	0.1	2.4	0.8	0.0
Delay (s)	4.5	9.6	5.2	16.7	21.3	12.2	39.2	61.9	41.1	41.5	49.0	40.7
Level of Service	A	A	A	B	C	B	D	E	D	D	D	D
Approach Delay (s)		8.5			17.7			52.1			44.4	
Approach LOS		A			B			D			D	

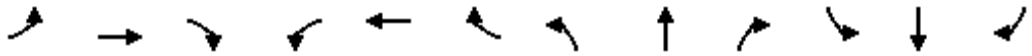
Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



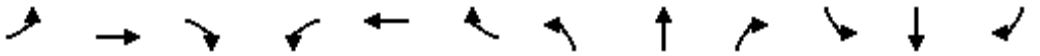
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	6	2	1	67	2	1229	15	191	948	12
Future Volume (vph)	8	0	6	2	1	67	2	1229	15	191	948	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3390	1667		1890	2933	1845	5292		3579	3689	1650
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3390	1667		1890	2933	1845	5292		3579	3689	1650
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.86	0.86	0.86	0.88	0.88	0.88
Adj. Flow (vph)	13	0	10	3	1	92	2	1429	17	217	1077	14
RTOR Reduction (vph)	0	0	10	0	0	77	0	1	0	0	0	3
Lane Group Flow (vph)	6	7	0	0	4	15	2	1445	0	217	1077	11
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	3.9	3.9	6.1		1.4	21.8	2.2	83.5		20.4	101.7	105.6
Effective Green, g (s)	3.9	3.9	6.1		1.4	21.8	2.2	83.5		20.4	101.7	105.6
Actuated g/C Ratio	0.03	0.03	0.05		0.01	0.16	0.02	0.62		0.15	0.76	0.79
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	49	98	75		19	617	30	3297		544	2799	1300
v/s Ratio Prot	c0.00	0.00	0.00		c0.00	0.00	0.00	c0.27		0.06	c0.29	0.00
v/s Ratio Perm			0.00			0.00						0.01
v/c Ratio	0.12	0.07	0.01		0.21	0.02	0.07	0.44		0.40	0.38	0.01
Uniform Delay, d1	63.4	63.3	61.1		65.8	47.2	64.9	13.1		51.3	5.5	3.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.05	0.72		0.74	0.39	1.00
Incremental Delay, d2	1.1	0.3	0.0		7.4	0.0	0.4	0.2		0.5	0.4	0.0
Delay (s)	64.5	63.6	61.1		73.2	47.2	68.3	9.7		38.2	2.5	3.0
Level of Service	E	E	E		E	D	E	A		D	A	A
Approach Delay (s)		62.7			48.3			9.7			8.5	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



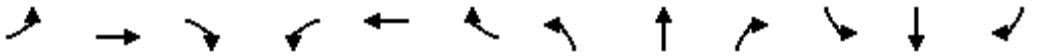
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	13	79	22	2	32	30	923	43	41	561	12
Future Volume (vph)	31	13	79	22	2	32	30	923	43	41	561	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		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		0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1734		1863	1961	1667	1845	3665		1810	3608	
Flt Permitted		0.91		0.37	1.00	1.00	0.40	1.00		0.25	1.00	
Satd. Flow (perm)		1603		719	1961	1667	779	3665		469	3608	
Peak-hour factor, PHF	0.72	0.72	0.72	0.74	0.74	0.74	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	43	18	110	30	3	43	32	992	46	46	623	13
RTOR Reduction (vph)	0	57	0	0	0	38	0	2	0	0	1	0
Lane Group Flow (vph)	0	114	0	30	3	5	32	1036	0	46	635	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.5		14.5	14.5	14.5	99.2	95.8		103.8	98.1	
Effective Green, g (s)		14.5		14.5	14.5	14.5	99.2	95.8		103.8	98.1	
Actuated g/C Ratio		0.11		0.11	0.11	0.11	0.74	0.71		0.77	0.73	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173		77	212	180	603	2620		420	2641	
v/s Ratio Prot					0.00		0.00	c0.28		c0.00	0.18	
v/s Ratio Perm		c0.07		0.04		0.00	0.04			0.08		
v/c Ratio		0.66		0.39	0.01	0.03	0.05	0.40		0.11	0.24	
Uniform Delay, d1		57.4		55.6	53.4	53.4	5.3	7.6		6.8	5.8	
Progression Factor		0.99		1.00	1.00	1.00	1.00	1.00		0.76	0.50	
Incremental Delay, d2		8.7		3.2	0.0	0.1	0.0	0.4		0.1	0.1	
Delay (s)		65.7		58.9	53.4	53.5	5.4	8.0		5.3	3.1	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		65.7			55.6			8.0			3.2	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



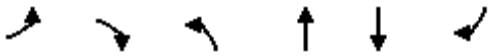
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	37	1	0	5	35	844	1	16	575	31
Future Volume (vph)	26	0	37	1	0	5	35	844	1	16	575	31
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1498		1845	3689		1845	3661	
Flt Permitted	0.75	1.00			0.95		0.38	1.00		0.30	1.00	
Satd. Flow (perm)	1475	1667			1433		740	3689		577	3661	
Peak-hour factor, PHF	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	36	0	51	1	0	7	39	948	1	19	676	36
RTOR Reduction (vph)	0	48	0	0	8	0	0	0	0	0	3	0
Lane Group Flow (vph)	36	3	0	0	0	0	39	949	0	19	709	0
Heavy Vehicles (%)	2%	2%	2%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.2	7.2			7.2		100.0	100.0		100.0	100.0	
Effective Green, g (s)	7.2	7.2			7.2		100.0	100.0		100.0	100.0	
Actuated g/C Ratio	0.06	0.06			0.06		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	89	100			86		621	3100		484	3076	
v/s Ratio Prot		0.00						c0.26			0.19	
v/s Ratio Perm	c0.02				0.00		0.05			0.03		
v/c Ratio	0.40	0.03			0.01		0.06	0.31		0.04	0.23	
Uniform Delay, d1	53.8	52.6			52.5		1.6	2.0		1.6	1.9	
Progression Factor	1.00	1.00			1.00		0.07	0.07		1.00	1.00	
Incremental Delay, d2	3.0	0.1			0.0		0.2	0.2		0.2	0.2	
Delay (s)	56.8	52.7			52.6		0.3	0.4		1.7	2.1	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		54.4			52.6			0.4			2.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	567	58	348	0	407	0	0	711	105
Future Volume (vph)	0	0	0	567	58	348	0	407	0	0	711	105
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3544	1923	2877		5353			5301	1650
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3544	1923	2877		5353			5301	1650
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	718	73	441	0	502	0	0	748	111
RTOR Reduction (vph)	0	0	0	0	0	275	0	0	0	0	0	39
Lane Group Flow (vph)	0	0	0	718	73	166	0	502	0	0	748	72
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				34.5	34.5	50.5		71.2			87.2	87.2
Effective Green, g (s)				34.5	34.5	50.5		71.2			87.2	87.2
Actuated g/C Ratio				0.26	0.26	0.38		0.53			0.65	0.65
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				912	495	1084		2844			3449	1073
v/s Ratio Prot				c0.20	0.04	0.06		0.09			c0.14	0.04
v/s Ratio Perm												
v/c Ratio				0.79	0.15	0.15		0.18			0.22	0.07
Uniform Delay, d1				46.3	38.4	27.6		16.2			9.5	8.5
Progression Factor				1.00	1.00	1.00		0.85			0.59	0.38
Incremental Delay, d2				4.5	0.1	0.1		0.1			0.1	0.1
Delay (s)				50.9	38.5	27.7		13.9			5.7	3.3
Level of Service				D	D	C		B			A	A
Approach Delay (s)		0.0			41.8			13.9			5.4	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	63	166	0	492	960	0
Future Volume (vph)	63	166	0	492	960	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.91	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3373	1502		3725	3689	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3373	1502		3725	3689	
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.86	0.86
Adj. Flow (vph)	69	182	0	553	1116	0
RTOR Reduction (vph)	85	85	0	0	0	0
Lane Group Flow (vph)	75	6	0	553	1116	0
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	8.8	8.8		113.2	113.2	
Effective Green, g (s)	8.8	8.8		113.2	113.2	
Actuated g/C Ratio	0.07	0.07		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	221	98		3146	3116	
v/s Ratio Prot	c0.02	0.00		0.15	c0.30	
v/s Ratio Perm						
v/c Ratio	0.34	0.06		0.18	0.36	
Uniform Delay, d1	59.8	58.7		1.9	2.3	
Progression Factor	1.00	1.00		2.70	0.38	
Incremental Delay, d2	1.1	0.3		0.1	0.3	
Delay (s)	60.9	59.0		5.2	1.2	
Level of Service	E	E		A	A	
Approach Delay (s)	60.2			5.2	1.2	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1455	37	4	556	4	5
Future Volume (Veh/h)	1455	37	4	556	4	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.60	0.60
Hourly flow rate (vph)	1672	43	5	654	7	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.93	
vC, conflicting volume			1715		2030	858
vC1, stage 1 conf vol					1694	
vC2, stage 2 conf vol					337	
vCu, unblocked vol			1715		1955	858
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			366		130	300

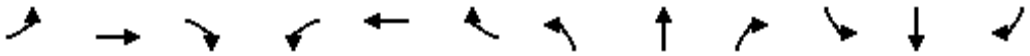
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1115	600	5	327	327	15
Volume Left	0	0	5	0	0	7
Volume Right	0	43	0	0	0	8
cSH	1700	1700	366	1700	1700	187
Volume to Capacity	0.66	0.35	0.01	0.19	0.19	0.08
Queue Length 95th (ft)	0	0	1	0	0	6
Control Delay (s)	0.0	0.0	15.0	0.0	0.0	26.0
Lane LOS			B			D
Approach Delay (s)	0.0		0.1			26.0
Approach LOS						D

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	787	6	0	419	0	3
Future Volume (Veh/h)	787	6	0	419	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	894	7	0	455	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.77		0.82	0.77
vC, conflicting volume			901		1352	450
vC1, stage 1 conf vol					898	
vC2, stage 2 conf vol					455	
vCu, unblocked vol			273		629	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			980		500	835

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	596	305	0	455	4
Volume Left	0	0	0	0	0
Volume Right	0	7	0	0	4
cSH	1700	1700	1700	1700	835
Volume to Capacity	0.35	0.18	0.00	0.27	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.3
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.3
Approach LOS					A

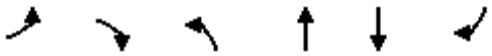
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	64	22	28	27	33	23	41	57	58	22	3
Future Volume (vph)	13	64	22	28	27	33	23	41	57	58	22	3
Peak Hour Factor	0.95	0.95	0.95	0.75	0.75	0.75	0.82	0.82	0.82	0.74	0.74	0.74
Hourly flow rate (vph)	14	67	23	37	36	44	28	50	70	78	30	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	14	90	37	80	28	120	78	34
Volume Left (vph)	14	0	37	0	28	0	78	0
Volume Right (vph)	0	23	0	44	0	70	0	4
Hadj (s)	0.53	-0.14	0.64	-0.25	0.57	-0.34	0.53	-0.05
Departure Headway (s)	5.8	5.1	5.9	5.0	5.7	4.8	5.7	5.2
Degree Utilization, x	0.02	0.13	0.06	0.11	0.04	0.16	0.12	0.05
Capacity (veh/h)	584	666	579	681	599	710	598	664
Control Delay (s)	7.7	7.7	8.1	7.4	7.8	7.6	8.3	7.2
Approach Delay (s)	7.7		7.6		7.6		8.0	
Approach LOS	A		A		A		A	

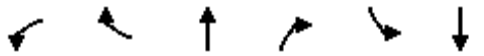
Intersection Summary				
Delay	7.7			
Level of Service	A			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	68	7	45	53	6	15
Future Volume (vph)	68	7	45	53	6	15
Peak Hour Factor	0.73	0.73	0.72	0.72	0.88	0.88
Hourly flow rate (vph)	93	10	63	74	7	17

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	93	10	63	74	24
Volume Left (vph)	93	0	63	0	0
Volume Right (vph)	0	10	0	0	17
Hadj (s)	0.53	-0.67	0.53	0.03	-0.39
Departure Headway (s)	5.4	4.2	5.3	4.8	4.4
Degree Utilization, x	0.14	0.01	0.09	0.10	0.03
Capacity (veh/h)	635	814	655	722	801
Control Delay (s)	8.1	6.1	7.7	7.2	7.5
Approach Delay (s)	7.9		7.4		7.5
Approach LOS	A		A		A

Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	4	818	23	20	594
Future Volume (Veh/h)	10	4	818	23	20	594
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	17	7	861	24	22	653
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.96					
vC, conflicting volume	1244	442			885	
vC1, stage 1 conf vol	873					
vC2, stage 2 conf vol	370					
vCu, unblocked vol	1168	442			885	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			97	
cM capacity (veh/h)	343	563			760	

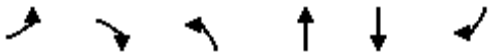
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	7	574	311	22	326	326
Volume Left	17	0	0	0	22	0	0
Volume Right	0	7	0	24	0	0	0
cSH	343	563	1700	1700	760	1700	1700
Volume to Capacity	0.05	0.01	0.34	0.18	0.03	0.19	0.19
Queue Length 95th (ft)	4	1	0	0	2	0	0
Control Delay (s)	16.0	11.5	0.0	0.0	9.9	0.0	0.0
Lane LOS	C	B			A		
Approach Delay (s)	14.7		0.0		0.3		
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	407	148	0	1278
Future Volume (Veh/h)	0	0	407	148	0	1278
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.81	0.81	0.95	0.95
Hourly flow rate (vph)	0	0	502	183	0	1345
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.95					
vC, conflicting volume	950	251			685	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	759	251			685	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	325	749			898	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	251	251	183	448	448	448
Volume Left	0	0	0	0	0	0
Volume Right	0	0	183	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.15	0.15	0.11	0.26	0.26	0.26
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	555	960	318
Future Volume (Veh/h)	0	0	0	555	960	318
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	0	624	1116	370
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.96	0.95	0.95			
vC, conflicting volume	1428	558	1486			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1251	429	1406			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	158	545	457			

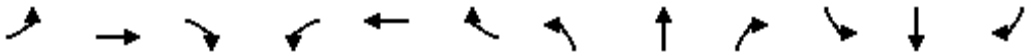
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	312	312	558	558	370
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	370
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.33	0.33	0.22
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	492	807	0	1126
Future Volume (Veh/h)	0	0	492	807	0	1126
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	553	907	0	1309
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.94					
vC, conflicting volume	989	276			1460	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	777	276			1460	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	314	721			454	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	276	276	907	436	436	436
Volume Left	0	0	0	0	0	0
Volume Right	0	0	907	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.16	0.53	0.26	0.26	0.26
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

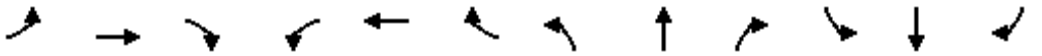
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	297	218	223	565	151	206	625	81	120	677	280
Future Volume (vph)	182	297	218	223	565	151	206	625	81	120	677	280
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3489		1863	3597		1863	3654		1862	3552	
Flt Permitted	0.19	1.00		0.21	1.00		0.10	1.00		0.21	1.00	
Satd. Flow (perm)	370	3489		418	3597		199	3654		416	3552	
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	204	334	245	240	608	162	226	687	89	126	713	295
RTOR Reduction (vph)	0	121	0	0	20	0	0	8	0	0	35	0
Lane Group Flow (vph)	204	458	0	240	750	0	226	768	0	126	973	0
Confl. Peds. (#/hr)	1					1			3	3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	34.1	21.2		48.9	29.4		54.7	42.4		54.7	42.4	
Effective Green, g (s)	34.1	21.2		48.9	29.4		54.7	42.4		54.7	42.4	
Actuated g/C Ratio	0.28	0.17		0.40	0.24		0.44	0.34		0.44	0.34	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	601		414	859		254	1259		329	1224	
v/s Ratio Prot	c0.08	0.13		c0.10	c0.21		c0.09	0.21		0.04	0.27	
v/s Ratio Perm	0.14			0.13			c0.31			0.13		
v/c Ratio	0.79	0.76		0.58	0.87		0.89	0.61		0.38	0.79	
Uniform Delay, d1	50.1	48.5		38.3	45.0		46.1	33.4		36.3	36.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.91	0.94	
Incremental Delay, d2	14.6	5.7		2.0	9.8		29.1	2.2		0.7	5.2	
Delay (s)	64.7	54.2		40.3	54.8		75.2	35.7		33.9	39.5	
Level of Service	E	D		D	D		E	D		C	D	
Approach Delay (s)		56.9			51.3			44.6			38.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

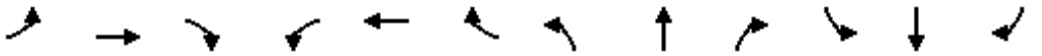
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	481	87	140	777	400	175	865	78	195	641	254
Future Volume (vph)	264	481	87	140	777	400	175	865	78	195	641	254
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3640		1863	3725	1667	1863	3679		1863	3567	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3640		1863	3725	1667	1863	3679		1863	3567	
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	300	547	99	152	845	435	190	940	85	205	675	267
RTOR Reduction (vph)	0	10	0	0	0	0	0	5	0	0	31	0
Lane Group Flow (vph)	300	636	0	152	845	435	190	1020	0	205	911	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	23.0	40.6		14.1	31.7	47.6	16.3	40.2		15.9	39.8	
Effective Green, g (s)	23.0	40.6		14.1	31.7	47.6	16.3	40.2		15.9	39.8	
Actuated g/C Ratio	0.17	0.30		0.10	0.23	0.35	0.12	0.30		0.12	0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	317	1094		194	874	587	224	1095		219	1051	
v/s Ratio Prot	c0.16	0.17		0.08	c0.23	0.09	0.10	c0.28		c0.11	0.26	
v/s Ratio Perm						0.17						
v/c Ratio	0.95	0.58		0.78	0.97	0.74	0.85	0.93		0.94	0.87	
Uniform Delay, d1	55.4	40.0		59.0	51.1	38.3	58.1	46.1		59.0	45.1	
Progression Factor	1.00	1.00		1.15	0.92	0.81	0.92	0.84		0.83	0.70	
Incremental Delay, d2	36.3	2.3		17.5	22.4	4.7	23.2	13.0		39.1	6.7	
Delay (s)	91.7	42.2		85.2	69.2	35.8	76.5	51.7		88.3	38.5	
Level of Service	F	D		F	E	D	E	D		F	D	
Approach Delay (s)		57.9			60.7			55.6			47.4	
Approach LOS		E			E			E			D	

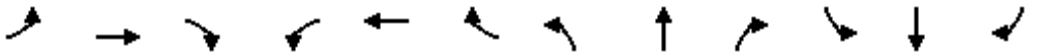
Intersection Summary			
HCM 2000 Control Delay	55.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	564	71	49	853	141	89	36	53	144	91	115
Future Volume (vph)	61	564	71	49	853	141	89	36	53	144	91	115
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3653		1862	1961	1619	1863	1961	1667	1863	1961	1667
Flt Permitted	0.16	1.00		0.36	1.00	1.00	0.57	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	307	3653		710	1961	1619	1122	1961	1667	1431	1961	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	66	606	76	52	898	148	105	42	62	164	103	131
RTOR Reduction (vph)	0	6	0	0	0	56	0	0	58	0	0	119
Lane Group Flow (vph)	66	676	0	52	898	92	105	42	4	164	103	12
Confl. Peds. (#/hr)	3		2	2		3						
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	88.8	84.2		88.8	84.2	84.2	17.8	8.4	8.4	25.8	12.4	12.4
Effective Green, g (s)	88.8	84.2		88.8	84.2	84.2	17.8	8.4	8.4	25.8	12.4	12.4
Actuated g/C Ratio	0.66	0.62		0.66	0.62	0.62	0.13	0.06	0.06	0.19	0.09	0.09
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254	2278		506	1223	1009	199	122	103	316	180	153
v/s Ratio Prot	c0.01	0.18		0.00	c0.46		0.04	0.02		c0.05	c0.05	
v/s Ratio Perm	0.16			0.06		0.06	0.03		0.00	0.05		0.01
v/c Ratio	0.26	0.30		0.10	0.73	0.09	0.53	0.34	0.04	0.52	0.57	0.08
Uniform Delay, d1	33.8	11.7		11.0	17.6	10.1	55.5	60.7	59.5	49.3	58.8	56.1
Progression Factor	1.00	0.96		0.29	0.43	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.0	1.8	0.1	2.5	1.7	0.1	1.4	4.3	0.2
Delay (s)	34.3	11.5		3.2	9.3	1.2	58.0	62.4	59.6	50.7	63.1	56.3
Level of Service	C	B		A	A	A	E	E	E	D	E	E
Approach Delay (s)		13.5			7.9			59.4			55.8	
Approach LOS		B			A			E			E	

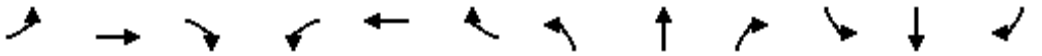
Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	25	412	354	49	43	360	695	211	10	921	58
Future Volume (vph)	56	25	412	354	49	43	360	695	211	10	921	58
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1823		3614	5353	1667	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1823		3614	5353	1667	1863	5353	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	59	26	434	385	53	47	396	764	232	11	969	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	110	0	0	37
Lane Group Flow (vph)	59	26	434	385	100	0	396	764	122	11	969	24
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	16.0	16.0	42.9	20.1	20.1		20.9	71.1	71.1	3.0	53.2	53.2
Effective Green, g (s)	16.0	16.0	42.9	20.1	20.1		20.9	71.1	71.1	3.0	53.2	53.2
Actuated g/C Ratio	0.12	0.12	0.32	0.15	0.15		0.15	0.53	0.53	0.02	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	232	932	538	271		559	2819	877	41	2109	656
v/s Ratio Prot	0.03	0.01	c0.15	c0.11	0.05		c0.11	0.14		0.01	c0.18	
v/s Ratio Perm									0.07			0.01
v/c Ratio	0.27	0.11	0.47	0.72	0.37		0.71	0.27	0.14	0.27	0.46	0.04
Uniform Delay, d1	54.2	53.2	36.9	54.7	51.7		54.2	17.6	16.3	64.9	30.3	25.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.61	0.53	0.44	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.4	4.7	1.0		3.9	0.2	0.3	3.5	0.7	0.1
Delay (s)	54.8	53.4	37.2	59.4	52.7		36.8	9.5	7.5	68.4	31.0	25.2
Level of Service	D	D	D	E	D		D	A	A	E	C	C
Approach Delay (s)		40.0			58.0			16.9			31.0	
Approach LOS		D			E			B			C	

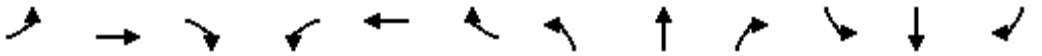
Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	409	202	68	787	97	190	208	43	162	368	128
Future Volume (vph)	85	409	202	68	787	97	190	208	43	162	368	128
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1632	1863	1961	1667	1863	1961	1667
Flt Permitted	0.07	1.00	1.00	0.37	1.00	1.00	0.12	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	133	1961	1667	722	1961	1632	239	1961	1667	875	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	89	431	213	72	828	102	213	234	48	195	443	154
RTOR Reduction (vph)	0	0	100	0	0	49	0	0	34	0	0	60
Lane Group Flow (vph)	89	431	113	72	828	53	213	234	14	195	443	94
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	66.1	58.8	71.8	63.3	57.4	69.9	45.8	32.8	38.7	44.8	32.3	39.6
Effective Green, g (s)	66.1	58.8	71.8	63.3	57.4	69.9	45.8	32.8	38.7	44.8	32.3	39.6
Actuated g/C Ratio	0.49	0.44	0.53	0.47	0.43	0.52	0.34	0.24	0.29	0.33	0.24	0.29
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	158	854	886	388	833	845	237	476	477	381	469	488
v/s Ratio Prot	c0.03	0.22	0.01	0.01	c0.42	0.01	c0.09	0.12	0.00	0.05	c0.23	0.01
v/s Ratio Perm	0.24		0.06	0.08		0.03	0.22		0.01	0.12		0.05
v/c Ratio	0.56	0.50	0.13	0.19	0.99	0.06	0.90	0.49	0.03	0.51	0.94	0.19
Uniform Delay, d1	30.1	27.6	15.9	20.8	38.6	16.2	36.6	43.9	34.6	34.0	50.5	35.7
Progression Factor	1.33	0.83	2.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	2.0	0.1	0.2	29.8	0.0	32.4	0.9	0.0	1.2	28.1	0.2
Delay (s)	44.3	25.0	45.2	21.1	68.4	16.3	69.1	44.9	34.7	35.2	78.6	35.9
Level of Service	D	C	D	C	E	B	E	D	C	D	E	D
Approach Delay (s)		33.2			59.7			54.3			59.6	
Approach LOS		C			E			D			E	

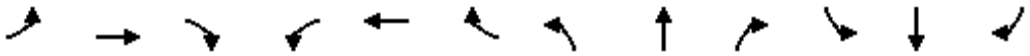
Intersection Summary			
HCM 2000 Control Delay	52.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	14	38	48	15	479	35	1270	60	419	1278	63
Future Volume (vph)	75	14	38	48	15	479	35	1270	60	419	1278	63
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3442	1667		1888	2933	1863	5317		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3442	1667		1888	2933	1863	5317		3614	3725	1667
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	93	17	47	56	17	557	39	1427	67	441	1345	66
RTOR Reduction (vph)	0	0	42	0	0	87	0	3	0	0	0	20
Lane Group Flow (vph)	46	64	5	0	73	470	39	1491	0	441	1345	46
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	9.0	9.0	15.0		9.9	42.8	6.0	58.4		32.9	85.3	94.3
Effective Green, g (s)	9.0	9.0	15.0		9.9	42.8	6.0	58.4		32.9	85.3	94.3
Actuated g/C Ratio	0.07	0.07	0.11		0.07	0.32	0.04	0.43		0.24	0.63	0.70
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	113	229	185		138	1068	82	2300		880	2353	1164
v/s Ratio Prot	c0.03	0.02	0.00		0.04	c0.11	0.02	c0.28		0.12	c0.36	0.00
v/s Ratio Perm			0.00			0.05						0.03
v/c Ratio	0.41	0.28	0.03		0.53	0.44	0.48	0.65		0.50	0.57	0.04
Uniform Delay, d1	60.4	59.9	53.5		60.3	36.6	63.0	30.2		44.0	14.3	6.3
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.86	1.03		0.94	0.87	1.56
Incremental Delay, d2	2.4	0.7	0.1		4.7	0.3	2.1	0.7		0.5	0.9	0.0
Delay (s)	62.8	60.6	53.6		65.0	36.9	56.4	31.8		41.6	13.3	9.9
Level of Service	E	E	D		E	D	E	C		D	B	A
Approach Delay (s)		59.1			40.2			32.5			19.9	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

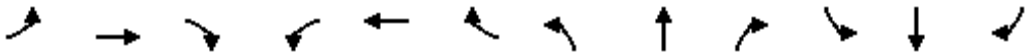
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	27	70	4	33	66	1047	50	53	762	11
Future Volume (vph)	17	1	27	70	4	33	66	1047	50	53	762	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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		0.92		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769		1863	1961	1667	1863	3700		1863	3718	
Flt Permitted		0.87		0.69	1.00	1.00	0.31	1.00		0.20	1.00	
Satd. Flow (perm)		1576		1362	1961	1667	611	3700		391	3718	
Peak-hour factor, PHF	0.60	0.60	0.60	0.72	0.72	0.72	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	28	2	45	97	6	46	73	1151	55	58	837	12
RTOR Reduction (vph)	0	40	0	0	0	41	0	2	0	0	1	0
Lane Group Flow (vph)	0	35	0	97	6	5	73	1204	0	58	848	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		14.6		14.6	14.6	14.6	102.4	97.8		102.4	97.8	
Effective Green, g (s)		14.6		14.6	14.6	14.6	102.4	97.8		102.4	97.8	
Actuated g/C Ratio		0.11		0.11	0.11	0.11	0.76	0.72		0.76	0.72	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170		147	212	180	506	2680		346	2693	
v/s Ratio Prot					0.00		0.00	c0.33		c0.01	0.23	
v/s Ratio Perm		0.02		c0.07		0.00	0.10			0.12		
v/c Ratio		0.21		0.66	0.03	0.03	0.14	0.45		0.17	0.32	
Uniform Delay, d1		54.9		57.8	53.9	53.9	6.3	7.6		9.3	6.6	
Progression Factor		1.01		1.00	1.00	1.00	1.00	1.00		0.81	0.81	
Incremental Delay, d2		0.6		10.2	0.1	0.1	0.1	0.5		0.1	0.2	
Delay (s)		56.1		68.1	53.9	53.9	6.4	8.1		7.6	5.5	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		56.1			63.1			8.0			5.7	
Approach LOS		E			E			A			A	

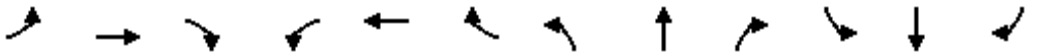
Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	0	57	7	0	34	41	1051	2	2	955	53
Future Volume (vph)	38	0	57	7	0	34	41	1051	2	2	955	53
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1601		1863	3725		1863	3696	
Flt Permitted	0.86	1.00			0.92		0.26	1.00		0.23	1.00	
Satd. Flow (perm)	1688	1667			1489		513	3725		454	3696	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	49	0	74	9	0	43	46	1168	2	2	1005	56
RTOR Reduction (vph)	0	69	0	0	40	0	0	0	0	0	3	0
Lane Group Flow (vph)	49	5	0	0	12	0	46	1170	0	2	1058	0
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	8.0	8.0			8.0		103.2	103.2		103.2	103.2	
Effective Green, g (s)	8.0	8.0			8.0		103.2	103.2		103.2	103.2	
Actuated g/C Ratio	0.07	0.07			0.07		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	108			96		430	3125		380	3101	
v/s Ratio Prot		0.00						c0.31			0.29	
v/s Ratio Perm	c0.03				0.01		0.09			0.00		
v/c Ratio	0.45	0.04			0.12		0.11	0.37		0.01	0.34	
Uniform Delay, d1	55.4	53.9			54.2		1.8	2.3		1.6	2.2	
Progression Factor	1.00	1.00			1.00		0.13	0.10		1.00	1.00	
Incremental Delay, d2	2.9	0.2			0.6		0.4	0.3		0.0	0.3	
Delay (s)	58.3	54.1			54.8		0.6	0.5		1.6	2.5	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		55.8			54.8			0.5			2.5	
Approach LOS		E			D			A			A	

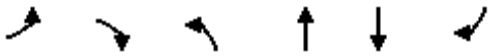
Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	506	397	332	0	1082	0	0	1301	456
Future Volume (vph)	0	0	0	506	397	332	0	1082	0	0	1301	456
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	533	418	349	0	1163	0	0	1369	480
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	0	79
Lane Group Flow (vph)	0	0	0	533	418	305	0	1163	0	0	1369	401
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				36.4	36.4	49.4		73.3			86.3	86.3
Effective Green, g (s)				36.4	36.4	49.4		73.3			86.3	86.3
Actuated g/C Ratio				0.27	0.27	0.37		0.54			0.64	0.64
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				974	528	1073		2906			3421	1065
v/s Ratio Prot				0.15	c0.21	0.10		0.22			c0.26	0.24
v/s Ratio Perm												
v/c Ratio				0.55	0.79	0.28		0.40			0.40	0.38
Uniform Delay, d1				42.2	45.8	30.3		18.0			11.8	11.6
Progression Factor				1.00	1.00	1.00		0.80			0.80	0.73
Incremental Delay, d2				0.6	8.0	0.1		0.4			0.3	0.9
Delay (s)				42.9	53.7	30.4		14.8			9.8	9.4
Level of Service				D	D	C		B			A	A
Approach Delay (s)		0.0			43.0			14.8			9.7	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	271	322	0	1213	1437	0
Future Volume (vph)	271	322	0	1213	1437	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3497	1517		3725	3725	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3497	1517		3725	3725	
Peak-hour factor, PHF	0.94	0.94	0.86	0.86	0.94	0.94
Adj. Flow (vph)	288	343	0	1410	1529	0
RTOR Reduction (vph)	49	49	0	0	0	0
Lane Group Flow (vph)	383	150	0	1410	1529	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	21.3	21.3		101.7	101.7	
Effective Green, g (s)	21.3	21.3		101.7	101.7	
Actuated g/C Ratio	0.16	0.16		0.75	0.75	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	551	239		2806	2806	
v/s Ratio Prot	c0.11	0.10		0.38	c0.41	
v/s Ratio Perm						
v/c Ratio	0.70	0.63		0.50	0.54	
Uniform Delay, d1	53.8	53.1		6.6	7.0	
Progression Factor	1.00	1.00		0.22	0.60	
Incremental Delay, d2	3.9	5.3		0.5	0.7	
Delay (s)	57.7	58.5		2.0	4.9	
Level of Service	E	E		A	A	
Approach Delay (s)	58.0			2.0	4.9	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	817	18	7	1199	15	15
Future Volume (Veh/h)	817	18	7	1199	15	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.63	0.63
Hourly flow rate (vph)	928	20	8	1303	24	24
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.78	
vC, conflicting volume			948		1606	474
vC1, stage 1 conf vol					938	
vC2, stage 2 conf vol					668	
vCu, unblocked vol			948		1206	474
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	96
cM capacity (veh/h)			720		319	537

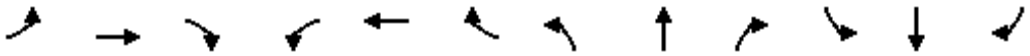
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	619	329	8	652	652	48
Volume Left	0	0	8	0	0	24
Volume Right	0	20	0	0	0	24
cSH	1700	1700	720	1700	1700	400
Volume to Capacity	0.36	0.19	0.01	0.38	0.38	0.12
Queue Length 95th (ft)	0	0	1	0	0	10
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.2
Lane LOS			B			C
Approach Delay (s)	0.0		0.1			15.2
Approach LOS						C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	701	3	14	839	5	2
Future Volume (Veh/h)	701	3	14	839	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.88	0.88
Hourly flow rate (vph)	738	3	15	883	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.89		0.71	0.89
vC, conflicting volume			741		1652	370
vC1, stage 1 conf vol					740	
vC2, stage 2 conf vol					913	
vCu, unblocked vol			449		1110	31
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	100
cM capacity (veh/h)			981		297	918

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	492	249	15	883	8
Volume Left	0	0	15	0	6
Volume Right	0	3	0	0	2
cSH	1700	1700	981	1700	357
Volume to Capacity	0.29	0.15	0.02	0.52	0.02
Queue Length 95th (ft)	0	0	1	0	2
Control Delay (s)	0.0	0.0	8.7	0.0	15.3
Lane LOS			A		C
Approach Delay (s)	0.0		0.1		15.3
Approach LOS					C

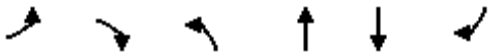
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	70	127	140	145	157	105	72	20	34	90	9
Future Volume (vph)	4	70	127	140	145	157	105	72	20	34	90	9
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90
Hourly flow rate (vph)	5	80	146	173	179	194	122	84	23	38	100	10

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	5	226	173	373	122	107	38	110
Volume Left (vph)	5	0	173	0	122	0	38	0
Volume Right (vph)	0	146	0	194	0	23	0	10
Hadj (s)	0.53	-0.42	0.53	-0.33	0.53	-0.12	0.53	-0.03
Departure Headway (s)	7.0	6.0	6.5	5.7	7.3	6.6	7.4	6.8
Degree Utilization, x	0.01	0.38	0.31	0.59	0.25	0.20	0.08	0.21
Capacity (veh/h)	485	570	531	618	466	508	449	487
Control Delay (s)	8.8	11.4	11.3	15.3	11.4	10.0	9.8	10.4
Approach Delay (s)	11.3		14.0		10.8		10.3	
Approach LOS	B		B		B		B	

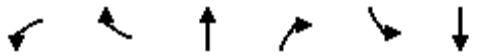
Intersection Summary				
Delay	12.4			
Level of Service	B			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	106	23	20	28	41	109
Future Volume (vph)	106	23	20	28	41	109
Peak Hour Factor	0.95	0.95	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	112	24	23	33	45	118

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	112	24	23	33	163
Volume Left (vph)	112	0	23	0	0
Volume Right (vph)	0	24	0	0	118
Hadj (s)	0.53	-0.67	0.57	0.07	-0.40
Departure Headway (s)	5.5	4.3	5.6	5.1	4.3
Degree Utilization, x	0.17	0.03	0.04	0.05	0.20
Capacity (veh/h)	619	787	620	679	795
Control Delay (s)	8.5	6.3	7.6	7.1	8.4
Approach Delay (s)	8.1		7.3		8.4
Approach LOS	A		A		A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	13	1023	21	3	1000
Future Volume (Veh/h)	22	13	1023	21	3	1000
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	25	15	1124	23	3	1053
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.92					
vC, conflicting volume	1668	574			1147	
vC1, stage 1 conf vol	1136					
vC2, stage 2 conf vol	532					
vCu, unblocked vol	1548	574			1147	
tC, single (s)	6.9	7.0			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.2	
p0 queue free %	90	97			100	
cM capacity (veh/h)	243	451			605	

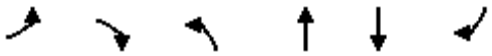
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	15	749	398	3	526	526
Volume Left	25	0	0	0	3	0	0
Volume Right	0	15	0	23	0	0	0
cSH	243	451	1700	1700	605	1700	1700
Volume to Capacity	0.10	0.03	0.44	0.23	0.00	0.31	0.31
Queue Length 95th (ft)	8	3	0	0	0	0	0
Control Delay (s)	21.5	13.3	0.0	0.0	11.0	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	18.4		0.0		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1082	402	0	1807
Future Volume (Veh/h)	0	0	1082	402	0	1807
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	0	1163	432	0	1902
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.93	0.88			0.88	
vC, conflicting volume	1797	582			1595	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	950	264			1410	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	241	649			424	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	582	582	432	634	634	634
Volume Left	0	0	0	0	0	0
Volume Right	0	0	432	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.34	0.25	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	56.9%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1484	1437	370
Future Volume (Veh/h)	0	0	0	1484	1437	370
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	0	1726	1529	394
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.91	0.86	0.86			
vC, conflicting volume	2392	764	1923			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1635	396	1745			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	84	518	305			

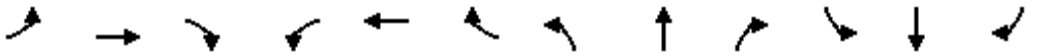
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	863	863	764	764	394
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	394
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.51	0.51	0.45	0.45	0.23
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	60.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1213	582	0	1759
Future Volume (Veh/h)	0	0	1213	582	0	1759
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	1410	677	0	1871
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.86	0.78			0.78	
vC, conflicting volume	2034	705			2087	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	51			1827	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	302	783			257	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	705	705	677	624	624	624
Volume Left	0	0	0	0	0	0
Volume Right	0	0	677	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.40	0.37	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

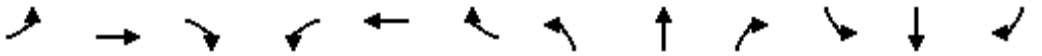
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	273	100	99	281	147	146	516	89	127	498	255
Future Volume (vph)	219	273	100	99	281	147	146	516	89	127	498	255
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3575		1863	3534		1863	3643		1863	3536	
Flt Permitted	0.27	1.00		0.32	1.00		0.23	1.00		0.32	1.00	
Satd. Flow (perm)	536	3575		618	3534		449	3643		624	3536	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	249	310	114	105	299	156	162	573	99	143	560	287
RTOR Reduction (vph)	0	36	0	0	66	0	0	12	0	0	53	0
Lane Group Flow (vph)	249	388	0	105	389	0	162	660	0	143	794	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.6	17.0		30.8	17.1		52.3	45.9		52.3	45.9	
Effective Green, g (s)	30.6	17.0		30.8	17.1		52.3	45.9		52.3	45.9	
Actuated g/C Ratio	0.28	0.16		0.28	0.16		0.48	0.42		0.48	0.42	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	316	557		331	554		298	1534		372	1489	
v/s Ratio Prot	c0.10	0.11		0.04	0.11		c0.03	0.18		0.02	0.22	
v/s Ratio Perm	c0.12			0.05			c0.23			0.16		
v/c Ratio	0.79	0.70		0.32	0.70		0.54	0.43		0.38	0.53	
Uniform Delay, d1	40.1	43.6		36.7	43.5		30.8	22.3		24.3	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.88	0.91	
Incremental Delay, d2	12.2	3.8		0.6	4.0		2.0	0.9		0.6	1.3	
Delay (s)	52.3	47.3		37.3	47.6		32.8	23.2		22.1	22.7	
Level of Service	D	D		D	D		C	C		C	C	
Approach Delay (s)		49.2			45.6			25.1			22.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

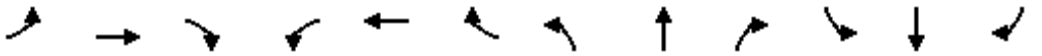
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	403	58	157	487	422	90	719	73	232	654	313
Future Volume (vph)	348	403	58	157	487	422	90	719	73	232	654	313
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3656		1863	3725	1667	1863	3674		1863	3545	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3656		1863	3725	1667	1863	3674		1863	3545	
Peak-hour factor, PHF	0.78	0.78	0.78	0.93	0.93	0.93	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	446	517	74	169	524	454	101	808	82	258	727	348
RTOR Reduction (vph)	0	8	0	0	0	0	0	6	0	0	43	0
Lane Group Flow (vph)	446	583	0	169	524	454	101	884	0	258	1032	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	33.3	39.0		15.6	21.3	41.0	11.4	33.5		19.7	41.8	
Effective Green, g (s)	33.3	39.0		15.6	21.3	41.0	11.4	33.5		19.7	41.8	
Actuated g/C Ratio	0.25	0.30		0.12	0.16	0.31	0.09	0.25		0.15	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	469	1080		220	601	517	160	932		278	1122	
v/s Ratio Prot	c0.24	0.16		0.09	0.14	c0.13	0.05	0.24		c0.14	c0.29	
v/s Ratio Perm						0.14						
v/c Ratio	0.95	0.54		0.77	0.87	0.88	0.63	0.95		0.93	0.92	
Uniform Delay, d1	48.5	39.0		56.4	54.0	43.1	58.3	48.4		55.5	43.5	
Progression Factor	1.00	1.00		1.14	0.90	0.79	1.20	0.84		0.79	0.73	
Incremental Delay, d2	29.5	1.9		14.2	15.2	14.9	7.6	17.4		32.1	10.7	
Delay (s)	78.0	40.9		78.4	63.6	48.9	77.4	58.2		75.6	42.2	
Level of Service	E	D		E	E	D	E	E		E	D	
Approach Delay (s)		56.9			59.9			60.2			48.7	
Approach LOS		E			E			E			D	

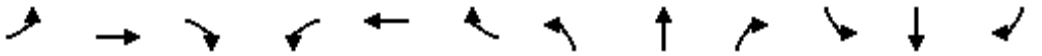
Intersection Summary			
HCM 2000 Control Delay	56.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	586	57	28	632	156	91	36	53	161	34	52
Future Volume (vph)	40	586	57	28	632	156	91	36	53	161	34	52
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3669		1862	1961	1667	1863	1961	1635	1854	1961	1667
Flt Permitted	0.28	1.00		0.37	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	542	3669		717	1961	1667	1431	1961	1635	1425	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	42	617	60	31	695	171	103	41	60	199	42	64
RTOR Reduction (vph)	0	4	0	0	0	66	0	0	57	0	0	61
Lane Group Flow (vph)	42	673	0	31	695	105	103	41	4	199	42	3
Confl. Peds. (#/hr)			1	1					4	4		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	89.0	83.3		84.4	81.0	81.0	21.5	7.7	7.7	20.3	7.1	7.1
Effective Green, g (s)	89.0	83.3		84.4	81.0	81.0	21.5	7.7	7.7	20.3	7.1	7.1
Actuated g/C Ratio	0.67	0.63		0.64	0.61	0.61	0.16	0.06	0.06	0.15	0.05	0.05
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	422	2315		487	1203	1022	278	114	95	262	105	89
v/s Ratio Prot	c0.00	0.18		0.00	c0.35		0.04	0.02		c0.08	0.02	
v/s Ratio Perm	0.06			0.04		0.06	0.02		0.00	c0.04		0.00
v/c Ratio	0.10	0.29		0.06	0.58	0.10	0.37	0.36	0.04	0.76	0.40	0.04
Uniform Delay, d1	19.0	11.0		11.3	15.3	10.5	49.5	59.8	58.7	52.4	60.4	59.2
Progression Factor	1.29	1.01		0.29	0.39	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.0	1.6	0.2	0.8	1.9	0.2	11.9	2.5	0.2
Delay (s)	24.6	11.4		3.4	7.6	1.3	50.4	61.7	58.8	64.3	62.9	59.4
Level of Service	C	B		A	A	A	D	E	E	E	E	E
Approach Delay (s)		12.2			6.2			55.1			63.1	
Approach LOS		B			A			E			E	

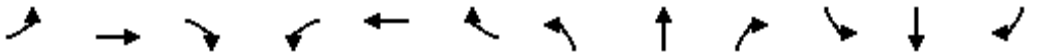
Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	120	740	646	146	39	680	782	488	23	1049	74
Future Volume (vph)	112	120	740	646	146	39	680	782	488	23	1049	74
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	128	787	710	160	43	716	823	514	24	1104	78
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	268	0	0	57
Lane Group Flow (vph)	119	128	787	710	203	0	716	823	246	24	1104	21
Confl. Peds. (#/hr)						2						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.0	12.0	50.4	27.9	27.9		32.4	63.3	63.3	4.0	34.9	34.9
Effective Green, g (s)	12.0	12.0	50.4	27.9	27.9		32.4	63.3	63.3	4.0	34.9	34.9
Actuated g/C Ratio	0.09	0.09	0.38	0.21	0.21		0.25	0.48	0.48	0.03	0.26	0.26
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	178	1119	763	399		887	2567	799	56	1415	434
v/s Ratio Prot	0.06	0.07	c0.27	c0.20	0.11		c0.20	0.15		0.01	c0.21	
v/s Ratio Perm									0.15			0.01
v/c Ratio	0.70	0.72	0.70	0.93	0.51		0.81	0.32	0.31	0.43	0.78	0.05
Uniform Delay, d1	58.3	58.4	34.5	51.1	46.0		46.9	21.1	21.0	62.9	45.0	36.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.76	0.76	0.69	1.00	1.00	1.00
Incremental Delay, d2	12.5	13.0	2.0	18.1	1.2		3.7	0.2	0.7	5.2	4.3	0.2
Delay (s)	70.8	71.4	36.5	69.2	47.2		39.4	16.3	15.2	68.1	49.3	36.4
Level of Service	E	E	D	E	D		D	B	B	E	D	D
Approach Delay (s)		44.8			64.3			24.1			48.9	
Approach LOS		D			E			C			D	

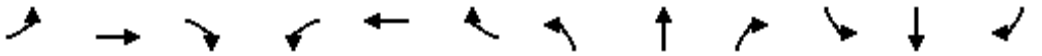
Intersection Summary				
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8	
Intersection Capacity Utilization	87.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	485	173	42	620	97	177	186	37	84	213	79
Future Volume (vph)	76	485	173	42	620	97	177	186	37	84	213	79
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1630	1863	1961	1667	1863	1961	1667
Flt Permitted	0.20	1.00	1.00	0.33	1.00	1.00	0.27	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	398	1961	1667	651	1961	1630	527	1961	1667	961	1961	1667
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	84	533	190	46	681	107	188	198	39	95	242	90
RTOR Reduction (vph)	0	0	74	0	0	44	0	0	31	0	0	71
Lane Group Flow (vph)	84	533	116	46	681	63	188	198	8	95	242	19
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	73.7	68.2	80.8	71.5	67.1	77.3	36.8	24.2	28.6	32.0	21.8	27.3
Effective Green, g (s)	73.7	68.2	80.8	71.5	67.1	77.3	36.8	24.2	28.6	32.0	21.8	27.3
Actuated g/C Ratio	0.56	0.52	0.61	0.54	0.51	0.59	0.28	0.18	0.22	0.24	0.17	0.21
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	283	1013	1020	393	996	954	274	359	361	302	323	344
v/s Ratio Prot	c0.01	0.27	0.01	0.00	c0.35	0.01	c0.07	0.10	0.00	0.02	0.12	0.00
v/s Ratio Perm	0.15		0.06	0.06		0.03	c0.13		0.00	0.05		0.01
v/c Ratio	0.30	0.53	0.11	0.12	0.68	0.07	0.69	0.55	0.02	0.31	0.75	0.05
Uniform Delay, d1	18.4	21.2	10.7	15.7	24.5	11.8	39.0	49.0	40.7	40.0	52.5	42.0
Progression Factor	0.84	0.97	3.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.8	0.0	0.1	3.8	0.0	7.0	2.0	0.0	0.6	9.5	0.1
Delay (s)	16.0	22.3	32.8	15.8	28.3	11.8	46.0	51.0	40.7	40.6	62.0	42.1
Level of Service	B	C	C	B	C	B	D	D	D	D	E	D
Approach Delay (s)		24.1			25.5			47.8			53.0	
Approach LOS		C			C			D			D	

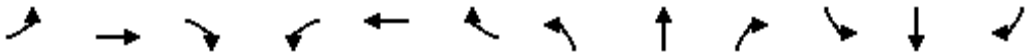
Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	27	56	71	9	568	38	1436	85	597	1175	103
Future Volume (vph)	109	27	56	71	9	568	38	1436	85	597	1175	103
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3454	1667		1878	2933	1863	5308		3614	3725	1667
Flt Permitted	0.95	0.97	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3454	1667		1878	2933	1863	5308		3614	3725	1667
Peak-hour factor, PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	33	67	76	10	604	40	1512	89	628	1237	108
RTOR Reduction (vph)	0	0	59	0	0	86	0	5	0	0	0	36
Lane Group Flow (vph)	65	99	8	0	86	518	40	1596	0	628	1237	72
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	8.5	8.5	15.3		12.2	45.1	6.8	53.6		32.9	79.7	88.2
Effective Green, g (s)	8.5	8.5	15.3		12.2	45.1	6.8	53.6		32.9	79.7	88.2
Actuated g/C Ratio	0.06	0.06	0.12		0.09	0.34	0.05	0.41		0.25	0.60	0.67
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	109	222	193		173	1144	95	2155		900	2249	1113
v/s Ratio Prot	c0.04	0.03	0.00		0.05	c0.11	0.02	c0.30		c0.17	0.33	0.00
v/s Ratio Perm			0.00			0.06						0.04
v/c Ratio	0.60	0.45	0.04		0.50	0.45	0.42	0.74		0.70	0.55	0.06
Uniform Delay, d1	60.1	59.5	51.8		57.0	33.8	60.7	33.3		45.0	15.5	7.6
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.91	1.03		1.00	0.95	1.38
Incremental Delay, d2	8.5	1.4	0.1		3.0	0.3	1.3	1.0		1.7	0.7	0.0
Delay (s)	68.6	60.9	51.9		60.0	34.2	56.4	35.4		46.5	15.4	10.5
Level of Service	E	E	D		E	C	E	D		D	B	B
Approach Delay (s)		60.5			37.4			35.9			25.0	
Approach LOS		E			D			D			C	

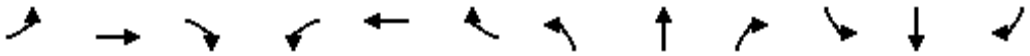
Intersection Summary					
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	132.0	Sum of lost time (s)		24.8	
Intersection Capacity Utilization	70.9%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group



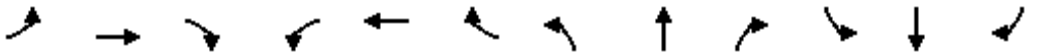
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	3	31	54	5	48	38	912	97	72	805	25
Future Volume (vph)	49	3	31	54	5	48	38	912	97	72	805	25
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		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	
Frpb, ped/bikes		1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806		1863	1961	1643	1863	3672		1863	3709	
Flt Permitted		0.81		0.65	1.00	1.00	0.30	1.00		0.23	1.00	
Satd. Flow (perm)		1515		1274	1961	1643	595	3672		459	3709	
Peak-hour factor, PHF	0.74	0.74	0.74	0.72	0.72	0.72	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	66	4	42	75	7	67	41	981	104	76	847	26
RTOR Reduction (vph)	0	19	0	0	0	60	0	4	0	0	1	0
Lane Group Flow (vph)	0	93	0	75	7	7	41	1081	0	76	872	0
Confl. Peds. (#/hr)	1					1						
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)		13.4		13.4	13.4	13.4	100.6	96.0		100.6	96.0	
Effective Green, g (s)		13.4		13.4	13.4	13.4	100.6	96.0		100.6	96.0	
Actuated g/C Ratio		0.10		0.10	0.10	0.10	0.76	0.73		0.76	0.73	
Clearance Time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		153		129	199	166	497	2670		398	2697	
v/s Ratio Prot					0.00		0.00	c0.29		c0.01	0.24	
v/s Ratio Perm		c0.06		0.06		0.00	0.06			0.14		
v/c Ratio		0.61		0.58	0.04	0.04	0.08	0.40		0.19	0.32	
Uniform Delay, d1		56.8		56.6	53.5	53.5	5.8	7.0		7.9	6.4	
Progression Factor		1.09		1.00	1.00	1.00	1.00	1.00		0.10	0.19	
Incremental Delay, d2		6.7		6.5	0.1	0.1	0.1	0.5		0.1	0.2	
Delay (s)		68.4		63.1	53.5	53.6	5.8	7.4		0.9	1.4	
Level of Service		E		E	D	D	A	A		A	A	
Approach Delay (s)		68.4			58.4			7.4			1.3	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	0	62	0	0	1	59	978	1	7	841	52
Future Volume (vph)	42	0	62	0	0	1	59	978	1	7	841	52
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1696		1863	3725		1861	3693	
Flt Permitted	0.76	1.00			1.00		0.30	1.00		0.26	1.00	
Satd. Flow (perm)	1483	1667			1696		586	3725		515	3693	
Peak-hour factor, PHF	0.90	0.90	0.90	0.60	0.60	0.60	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	47	0	69	0	0	2	63	1052	1	7	885	55
RTOR Reduction (vph)	0	64	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	47	5	0	0	0	0	63	1053	0	7	937	0
Confl. Peds. (#/hr)									1	1		
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.8	7.8			7.8		89.4	89.4		89.4	89.4	
Effective Green, g (s)	7.8	7.8			7.8		89.4	89.4		89.4	89.4	
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.82		0.82	0.82	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	119			121		480	3055		422	3028	
v/s Ratio Prot		0.00			0.00			c0.28			0.25	
v/s Ratio Perm	c0.03						0.11			0.01		
v/c Ratio	0.44	0.04			0.00		0.13	0.34		0.02	0.31	
Uniform Delay, d1	48.5	47.1			47.0		2.0	2.5		1.8	2.4	
Progression Factor	1.00	1.00			1.00		0.41	0.35		1.00	1.00	
Incremental Delay, d2	2.9	0.1			0.0		0.5	0.3		0.1	0.3	
Delay (s)	51.5	47.3			47.0		1.3	1.1		1.9	2.6	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.0			47.0			1.2			2.6	
Approach LOS		D			D			A			A	

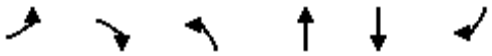
Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	615	170	985	0	1473	0	0	1782	467
Future Volume (vph)	0	0	0	615	170	985	0	1473	0	0	1782	467
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	699	193	1119	0	1551	0	0	1958	513
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	0	0	0	145
Lane Group Flow (vph)	0	0	0	699	193	1103	0	1551	0	0	1958	368
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				33.7	33.7	55.7		64.0			86.0	86.0
Effective Green, g (s)				33.7	33.7	55.7		64.0			86.0	86.0
Actuated g/C Ratio				0.26	0.26	0.42		0.48			0.65	0.65
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				922	500	1237		2595			3487	1086
v/s Ratio Prot				0.19	0.10	c0.38		c0.29			0.37	0.22
v/s Ratio Perm												
v/c Ratio				0.76	0.39	0.89		0.60			0.56	0.34
Uniform Delay, d1				45.4	40.6	35.4		24.7			12.6	10.3
Progression Factor				1.00	1.00	1.00		0.95			0.90	1.42
Incremental Delay, d2				3.6	0.5	8.4		0.8			0.4	0.5
Delay (s)				49.0	41.1	43.8		24.1			11.7	15.1
Level of Service				D	D	D		C			B	B
Approach Delay (s)		0.0			45.3			24.1			12.4	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	457	366	0	1480	1808	0
Future Volume (vph)	457	366	0	1480	1808	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3552	1517		3725	3725	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3552	1517		3725	3725	
Peak-hour factor, PHF	0.95	0.95	0.94	0.94	0.94	0.94
Adj. Flow (vph)	481	385	0	1574	1923	0
RTOR Reduction (vph)	12	12	0	0	0	0
Lane Group Flow (vph)	581	261	0	1574	1923	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	30.0	30.0		90.0	90.0	
Effective Green, g (s)	30.0	30.0		90.0	90.0	
Actuated g/C Ratio	0.23	0.23		0.68	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	807	344		2539	2539	
v/s Ratio Prot	0.16	c0.17		0.42	c0.52	
v/s Ratio Perm						
v/c Ratio	0.72	0.76		0.62	0.76	
Uniform Delay, d1	47.1	47.6		11.6	13.8	
Progression Factor	1.00	1.00		0.54	0.99	
Incremental Delay, d2	3.3	9.6		0.9	1.7	
Delay (s)	50.4	57.2		7.1	15.4	
Level of Service	D	E		A	B	
Approach Delay (s)	52.6			7.1	15.4	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	891	11	14	882	16	7
Future Volume (Veh/h)	891	11	14	882	16	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.87	0.87	0.82	0.82
Hourly flow rate (vph)	979	12	16	1014	20	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				619		
pX, platoon unblocked					0.86	
vC, conflicting volume			991		1524	496
vC1, stage 1 conf vol					985	
vC2, stage 2 conf vol					539	
vCu, unblocked vol			991		1291	496
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	98
cM capacity (veh/h)			693		301	520

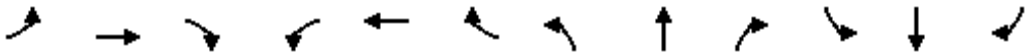
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	653	338	16	507	507	29
Volume Left	0	0	16	0	0	20
Volume Right	0	12	0	0	0	9
cSH	1700	1700	693	1700	1700	346
Volume to Capacity	0.38	0.20	0.02	0.30	0.30	0.08
Queue Length 95th (ft)	0	0	2	0	0	7
Control Delay (s)	0.0	0.0	10.3	0.0	0.0	16.3
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			16.3
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	662	3	1	910	2	3
Future Volume (Veh/h)	662	3	1	910	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.63	0.63
Hourly flow rate (vph)	697	3	1	958	3	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.91		0.77	0.91
vC, conflicting volume			700		1658	350
vC1, stage 1 conf vol					698	
vC2, stage 2 conf vol					960	
vCu, unblocked vol			472		1265	87
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			988		279	868

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	465	235	1	958	8
Volume Left	0	0	1	0	3
Volume Right	0	3	0	0	5
cSH	1700	1700	988	1700	484
Volume to Capacity	0.27	0.14	0.00	0.56	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	8.6	0.0	12.6
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		12.6
Approach LOS					B

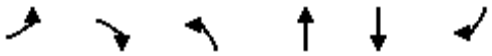
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	90	180	24	83	35	153	64	18	37	79	23
Future Volume (vph)	9	90	180	24	83	35	153	64	18	37	79	23
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.67	0.67	0.67
Hourly flow rate (vph)	9	95	189	25	87	37	178	74	21	55	118	34

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	9	284	25	124	178	95	55	152
Volume Left (vph)	9	0	25	0	178	0	55	0
Volume Right (vph)	0	189	0	37	0	21	0	34
Hadj (s)	0.53	-0.43	0.53	-0.17	0.53	-0.12	0.53	-0.12
Departure Headway (s)	6.6	5.6	6.8	6.1	6.6	5.9	6.7	6.0
Degree Utilization, x	0.02	0.44	0.05	0.21	0.32	0.16	0.10	0.25
Capacity (veh/h)	514	609	493	552	522	573	505	562
Control Delay (s)	8.5	11.9	8.9	9.5	11.5	8.8	9.2	9.8
Approach Delay (s)	11.8		9.4		10.5		9.7	
Approach LOS	B		A		B		A	

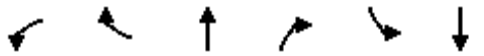
Intersection Summary				
Delay	10.6			
Level of Service	B			
Intersection Capacity Utilization	40.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	137	36	23	26	22	79
Future Volume (vph)	137	36	23	26	22	79
Peak Hour Factor	0.77	0.77	0.82	0.82	0.77	0.77
Hourly flow rate (vph)	178	47	28	32	29	103

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	178	47	28	32	132
Volume Left (vph)	178	0	28	0	0
Volume Right (vph)	0	47	0	0	103
Hadj (s)	0.53	-0.67	0.53	0.03	-0.43
Departure Headway (s)	5.5	4.3	5.8	5.3	4.6
Degree Utilization, x	0.27	0.06	0.04	0.05	0.17
Capacity (veh/h)	628	801	594	647	749
Control Delay (s)	9.3	6.4	7.8	7.3	8.5
Approach Delay (s)	8.7		7.6		8.5
Approach LOS	A		A		A

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	1	1041	14	2	877
Future Volume (Veh/h)	17	1	1041	14	2	877
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	28	2	1144	15	2	923
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.92					
vC, conflicting volume	1618	580			1160	
vC1, stage 1 conf vol	1152					
vC2, stage 2 conf vol	466					
vCu, unblocked vol	1496	580			1160	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	100			100	
cM capacity (veh/h)	248	457			597	

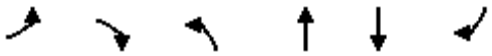
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	28	2	763	396	2	462	462
Volume Left	28	0	0	0	2	0	0
Volume Right	0	2	0	15	0	0	0
cSH	248	457	1700	1700	597	1700	1700
Volume to Capacity	0.11	0.00	0.45	0.23	0.00	0.27	0.27
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	21.3	12.9	0.0	0.0	11.0	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	20.8		0.0		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1473	464	0	2397
Future Volume (Veh/h)	0	0	1473	464	0	2397
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	0	0	1551	488	0	2634
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.89	0.78			0.78	
vC, conflicting volume	2429	776			2039	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	961	161			1773	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	225	670			272	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	776	776	488	878	878	878
Volume Left	0	0	0	0	0	0
Volume Right	0	0	488	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.46	0.29	0.52	0.52	0.52
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1937	1808	589
Future Volume (Veh/h)	0	0	0	1937	1808	589
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	2061	1923	627
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.87	0.78	0.78			
vC, conflicting volume	2954	962	2550			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1789	377	2421			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	63	482	150			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1030	1030	962	962	627
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	627
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.61	0.61	0.57	0.57	0.37
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

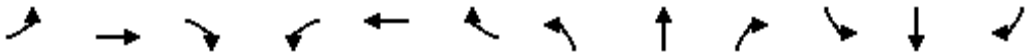
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1480	769	0	2174
Future Volume (Veh/h)	0	0	1480	769	0	2174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	1574	818	0	2313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.80	0.75			0.75	
vC, conflicting volume	2345	787			2392	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	31			2184	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	691	772			178	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	787	787	818	771	771	771
Volume Left	0	0	0	0	0	0
Volume Right	0	0	818	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.46	0.48	0.45	0.45	0.45
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

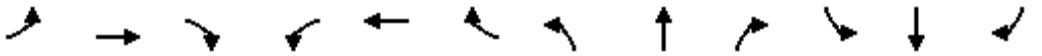
APPENDIX B-3. Background (2028) Conditions Capacity Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	329	547	178	87	231	114	126	560	181	121	413	120
Future Volume (vph)	329	547	178	87	231	114	126	560	181	121	413	120
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3576		1776	3375		1844	3554		1863	3588	
Flt Permitted	0.38	1.00		0.24	1.00		0.35	1.00		0.23	1.00	
Satd. Flow (perm)	745	3576		453	3375		672	3554		443	3588	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	374	622	202	97	257	127	137	609	197	134	459	133
RTOR Reduction (vph)	0	28	0	0	66	0	0	23	0	0	20	0
Lane Group Flow (vph)	374	796	0	97	318	0	137	783	0	134	572	0
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	47.3	32.1		25.1	16.5		52.3	46.1		52.3	46.1	
Effective Green, g (s)	47.3	32.1		25.1	16.5		52.3	46.1		52.3	46.1	
Actuated g/C Ratio	0.40	0.27		0.21	0.14		0.44	0.39		0.44	0.39	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	523	964		191	467		356	1376		268	1389	
v/s Ratio Prot	c0.15	c0.22		0.04	0.09		0.02	c0.22		c0.03	0.16	
v/s Ratio Perm	0.14			0.07			0.15			0.19		
v/c Ratio	0.72	0.83		0.51	0.68		0.38	0.57		0.50	0.41	
Uniform Delay, d1	33.7	40.8		49.6	48.7		28.7	28.6		35.8	26.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.93	0.94	
Incremental Delay, d2	4.6	5.8		2.1	4.1		0.7	1.7		1.4	0.9	
Delay (s)	38.3	46.7		51.8	52.8		29.4	30.4		34.7	25.8	
Level of Service	D	D		D	D		C	C		C	C	
Approach Delay (s)		44.0			52.6			30.2			27.4	
Approach LOS		D			D			C			C	

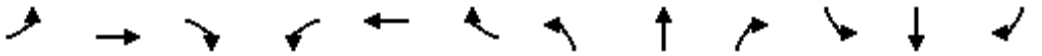
Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



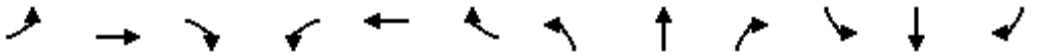
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	988	131	112	296	241	95	916	109	196	522	199
Future Volume (vph)	420	988	131	112	296	241	95	916	109	196	522	199
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1845	3624		1792	3585	1604	1845	3631		1845	3536	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1845	3624		1792	3585	1604	1845	3631		1845	3536	
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	483	1136	151	132	348	284	103	996	118	215	574	219
RTOR Reduction (vph)	0	8	0	0	0	0	0	7	0	0	29	0
Lane Group Flow (vph)	483	1279	0	132	348	284	103	1107	0	215	764	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	37.5	46.0		10.0	18.5	35.4	12.0	36.9		16.9	41.8	
Effective Green, g (s)	37.5	46.0		10.0	18.5	35.4	12.0	36.9		16.9	41.8	
Actuated g/C Ratio	0.28	0.34		0.07	0.14	0.26	0.09	0.28		0.13	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	516	1244		133	494	423	165	999		232	1103	
v/s Ratio Prot	c0.26	c0.35		0.07	0.10	0.08	0.06	c0.31		c0.12	c0.22	
v/s Ratio Perm						0.09						
v/c Ratio	0.94	1.03		0.99	0.70	0.67	0.62	1.11		0.93	0.69	
Uniform Delay, d1	47.1	44.0		62.0	55.1	44.1	58.8	48.5		57.9	40.5	
Progression Factor	0.92	0.91		1.04	0.98	0.81	0.87	0.91		0.86	0.81	
Incremental Delay, d2	21.6	30.8		73.5	7.8	4.0	6.8	62.3		38.0	1.8	
Delay (s)	65.0	71.0		137.9	62.0	39.9	57.8	106.6		87.6	34.6	
Level of Service	E	E		F	E	D	E	F		F	C	
Approach Delay (s)		69.4			66.9			102.5			45.9	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	72.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	830	36	26	513	83	44	23	55	42	8	86
Future Volume (vph)	127	830	36	26	513	83	44	23	55	42	8	86
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	3631		1792	1887	1604	1841	1748	1650	1667	1754	1457
Flt Permitted	0.36	1.00		0.27	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	686	3631		505	1887	1604	1454	1748	1650	1299	1754	1457
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.70	0.70	0.70
Adj. Flow (vph)	140	912	40	31	604	98	50	26	62	60	11	123
RTOR Reduction (vph)	0	2	0	0	0	33	0	0	60	0	0	116
Lane Group Flow (vph)	140	950	0	31	604	65	50	26	3	60	11	7
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	14%	14%	14%
Parking (#/hr)								0				
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	101.3	92.9		91.9	88.2	88.2	11.6	6.5	6.5	14.4	7.9	7.9
Effective Green, g (s)	101.3	92.9		91.9	88.2	88.2	11.6	6.5	6.5	14.4	7.9	7.9
Actuated g/C Ratio	0.76	0.69		0.69	0.66	0.66	0.09	0.05	0.05	0.11	0.06	0.06
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	590	2517		381	1242	1055	140	84	80	157	103	85
v/s Ratio Prot	c0.01	0.26		0.00	c0.32		0.01	0.01		c0.02	0.01	
v/s Ratio Perm	0.16			0.05		0.04	0.02		0.00	c0.02		0.00
v/c Ratio	0.24	0.38		0.08	0.49	0.06	0.36	0.31	0.04	0.38	0.11	0.09
Uniform Delay, d1	11.0	8.5		10.6	11.5	8.2	57.9	61.6	60.8	56.0	59.7	59.6
Progression Factor	0.22	0.42		0.43	0.60	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0		0.1	1.3	0.1	1.6	2.1	0.2	1.6	0.5	0.4
Delay (s)	2.4	3.7		4.6	8.2	0.8	59.5	63.7	61.0	57.5	60.2	60.1
Level of Service	A	A		A	A	A	E	E	E	E	E	E
Approach Delay (s)		3.5			7.1			60.9			59.3	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



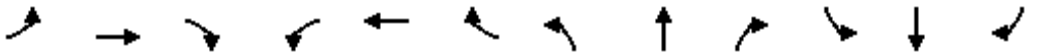
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	82	33	2	3	81	477	94	1	724	15
Future Volume (vph)	5	2	82	33	2	3	81	477	94	1	724	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	7	3	112	48	3	4	103	604	119	1	872	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	34	0	0	6
Lane Group Flow (vph)	7	3	112	48	7	0	103	604	85	1	872	12
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	6.0	21.0	6.6	6.6		9.0	95.3	95.3	1.3	87.6	87.6
Effective Green, g (s)	6.0	6.0	21.0	6.6	6.6		9.0	95.3	95.3	1.3	87.6	87.6
Actuated g/C Ratio	0.04	0.04	0.16	0.05	0.05		0.07	0.71	0.71	0.01	0.65	0.65
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	85	446	163	81		240	3770	1173	18	3499	1089
v/s Ratio Prot	0.00	0.00	c0.04	c0.01	0.00		c0.03	0.11		0.00	c0.16	
v/s Ratio Perm									0.05			0.01
v/c Ratio	0.09	0.04	0.25	0.29	0.09		0.43	0.16	0.07	0.06	0.25	0.01
Uniform Delay, d1	61.4	61.2	49.6	61.5	60.8		60.0	6.3	5.9	65.7	9.6	8.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.16	0.59	0.40	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	1.2	0.5		1.2	0.1	0.1	1.3	0.2	0.0
Delay (s)	61.8	61.4	49.9	62.6	61.4		70.8	3.8	2.5	67.0	9.8	8.1
Level of Service	E	E	D	E	E		E	A	A	E	A	A
Approach Delay (s)		50.9			62.5			12.0			9.8	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	594	79	29	336	203	153	273	90	125	131	74
Future Volume (vph)	133	594	79	29	336	203	153	273	90	125	131	74
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1845	1942	1650	1827	1923	1635	1861	1961	1667	1845	1942	1620
Flt Permitted	0.44	1.00	1.00	0.23	1.00	1.00	0.54	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	861	1942	1650	433	1923	1635	1067	1961	1667	482	1942	1620
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	143	639	85	33	378	228	161	287	95	147	154	87
RTOR Reduction (vph)	0	0	35	0	0	95	0	0	73	0	0	67
Lane Group Flow (vph)	143	639	50	33	378	133	161	287	22	147	154	20
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	71.6	66.1	78.4	71.6	66.1	78.2	37.6	25.3	30.8	37.2	25.1	30.6
Effective Green, g (s)	71.6	66.1	78.4	71.6	66.1	78.2	37.6	25.3	30.8	37.2	25.1	30.6
Actuated g/C Ratio	0.53	0.49	0.59	0.53	0.49	0.58	0.28	0.19	0.23	0.28	0.19	0.23
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	500	957	965	288	948	954	372	370	383	256	363	369
v/s Ratio Prot	c0.01	c0.33	0.00	0.00	0.20	0.01	0.04	c0.15	0.00	c0.05	0.08	0.00
v/s Ratio Perm	0.14		0.03	0.06		0.07	0.08		0.01	0.11		0.01
v/c Ratio	0.29	0.67	0.05	0.11	0.40	0.14	0.43	0.78	0.06	0.57	0.42	0.05
Uniform Delay, d1	16.3	25.7	11.9	18.5	21.4	12.6	38.0	51.7	40.3	38.9	48.1	40.4
Progression Factor	0.36	0.43	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	3.5	0.0	0.2	1.3	0.1	0.8	10.1	0.1	3.1	0.9	0.1
Delay (s)	6.2	14.5	7.2	18.7	22.7	12.7	38.9	61.7	40.3	42.0	49.0	40.5
Level of Service	A	B	A	B	C	B	D	E	D	D	D	D
Approach Delay (s)		12.4			18.9			51.2			44.4	
Approach LOS		B			B			D			D	

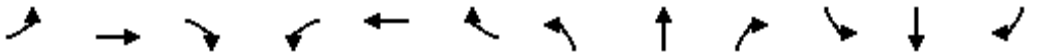
Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



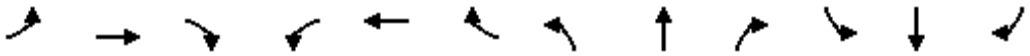
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	0	6	2	1	85	2	1316	16	222	999	48
Future Volume (vph)	38	0	6	2	1	85	2	1316	16	222	999	48
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3390	1667		1890	2933	1845	5291		3579	3689	1650
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3390	1667		1890	2933	1845	5291		3579	3689	1650
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.86	0.86	0.86	0.88	0.88	0.88
Adj. Flow (vph)	63	0	10	3	1	116	2	1530	19	252	1135	55
RTOR Reduction (vph)	0	0	9	0	0	97	0	1	0	0	0	12
Lane Group Flow (vph)	31	32	1	0	4	19	2	1548	0	252	1135	43
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	5.5	5.5	7.7		1.4	21.8	2.2	81.9		20.4	100.1	105.6
Effective Green, g (s)	5.5	5.5	7.7		1.4	21.8	2.2	81.9		20.4	100.1	105.6
Actuated g/C Ratio	0.04	0.04	0.06		0.01	0.16	0.02	0.61		0.15	0.75	0.79
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	69	139	95		19	617	30	3233		544	2755	1300
v/s Ratio Prot	c0.02	0.01	0.00		c0.00	0.00	0.00	c0.29		c0.07	0.31	0.00
v/s Ratio Perm			0.00			0.00						0.02
v/c Ratio	0.45	0.23	0.01		0.21	0.03	0.07	0.48		0.46	0.41	0.03
Uniform Delay, d1	62.8	62.2	59.5		65.8	47.2	64.9	14.3		51.8	6.2	3.1
Progression Factor	1.01	1.02	1.00		1.00	1.00	0.97	0.83		0.73	0.43	0.01
Incremental Delay, d2	4.6	0.8	0.0		7.4	0.0	0.3	0.2		0.7	0.4	0.0
Delay (s)	68.0	64.0	59.6		73.2	47.2	63.0	12.0		38.6	3.1	0.1
Level of Service	E	E	E		E	D	E	B		D	A	A
Approach Delay (s)		65.1			48.1			12.1			9.2	
Approach LOS		E			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



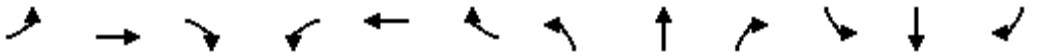
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	14	118	23	2	34	45	1040	45	43	637	19
Future Volume (vph)	50	14	118	23	2	34	45	1040	45	43	637	19
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	1665		1863	1961	1667	1845	3667		1810	3603	
Flt Permitted	0.76	1.00		0.34	1.00	1.00	0.36	1.00		0.21	1.00	
Satd. Flow (perm)	1454	1665		665	1961	1667	703	3667		408	3603	
Peak-hour factor, PHF	0.72	0.72	0.72	0.74	0.74	0.74	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	69	19	164	31	3	46	48	1118	48	48	708	21
RTOR Reduction (vph)	0	150	0	0	0	42	0	1	0	0	1	0
Lane Group Flow (vph)	69	33	0	31	3	4	48	1165	0	48	728	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	11.8	11.8		11.8	11.8	11.8	104.2	99.7		104.2	99.7	
Effective Green, g (s)	11.8	11.8		11.8	11.8	11.8	104.2	99.7		104.2	99.7	
Actuated g/C Ratio	0.09	0.09		0.09	0.09	0.09	0.78	0.74		0.78	0.74	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	128	146		58	172	146	585	2728		364	2680	
v/s Ratio Prot		0.02			0.00		0.00	c0.32		c0.00	0.20	
v/s Ratio Perm	c0.05			0.05		0.00	0.06			0.10		
v/c Ratio	0.54	0.23		0.53	0.02	0.03	0.08	0.43		0.13	0.27	
Uniform Delay, d1	58.5	56.9		58.5	55.8	55.9	4.4	6.4		7.2	5.5	
Progression Factor	1.02	1.06		1.00	1.00	1.00	1.00	1.00		1.27	0.70	
Incremental Delay, d2	4.3	0.8		9.1	0.0	0.1	0.1	0.5		0.1	0.1	
Delay (s)	63.8	60.8		67.6	55.8	55.9	4.4	6.9		9.2	4.0	
Level of Service	E	E		E	E	E	A	A		A	A	
Approach Delay (s)		61.6			60.5			6.8			4.3	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



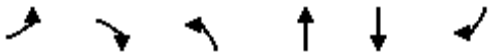
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	39	1	0	5	37	970	1	17	686	33
Future Volume (vph)	27	0	39	1	0	5	37	970	1	17	686	33
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1498		1845	3689		1845	3664	
Flt Permitted	0.75	1.00			0.95		0.33	1.00		0.25	1.00	
Satd. Flow (perm)	1475	1667			1433		645	3689		492	3664	
Peak-hour factor, PHF	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	38	0	54	1	0	7	42	1090	1	20	807	39
RTOR Reduction (vph)	0	51	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	38	3	0	0	0	0	42	1091	0	20	844	0
Heavy Vehicles (%)	2%	2%	2%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.3	7.3			7.3		99.9	99.9		99.9	99.9	
Effective Green, g (s)	7.3	7.3			7.3		99.9	99.9		99.9	99.9	
Actuated g/C Ratio	0.06	0.06			0.06		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	102			87		541	3096		413	3075	
v/s Ratio Prot		0.00						c0.30			0.23	
v/s Ratio Perm	c0.03				0.00		0.07			0.04		
v/c Ratio	0.42	0.03			0.01		0.08	0.35		0.05	0.27	
Uniform Delay, d1	53.8	52.5			52.4		1.6	2.2		1.6	2.0	
Progression Factor	1.00	1.00			1.00		0.10	0.09		1.00	1.00	
Incremental Delay, d2	3.2	0.1			0.0		0.2	0.3		0.2	0.2	
Delay (s)	57.0	52.7			52.5		0.4	0.4		1.8	2.2	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		54.4			52.5			0.4			2.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	625	61	366	0	451	0	0	766	110
Future Volume (vph)	0	0	0	625	61	366	0	451	0	0	766	110
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3544	1923	2877		5353			5301	1650
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3544	1923	2877		5353			5301	1650
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	791	77	463	0	557	0	0	806	116
RTOR Reduction (vph)	0	0	0	0	0	252	0	0	0	0	0	42
Lane Group Flow (vph)	0	0	0	791	77	211	0	557	0	0	806	74
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				36.7	36.7	52.7		69.0			85.0	85.0
Effective Green, g (s)				36.7	36.7	52.7		69.0			85.0	85.0
Actuated g/C Ratio				0.27	0.27	0.39		0.51			0.63	0.63
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				970	526	1131		2756			3362	1046
v/s Ratio Prot				c0.22	0.04	0.07		0.10			c0.15	0.04
v/s Ratio Perm												
v/c Ratio				0.82	0.15	0.19		0.20			0.24	0.07
Uniform Delay, d1				45.5	36.8	26.6		17.6			10.6	9.4
Progression Factor				1.00	1.00	1.00		0.82			0.60	0.35
Incremental Delay, d2				5.4	0.1	0.1		0.2			0.2	0.1
Delay (s)				50.8	36.9	26.7		14.5			6.5	3.4
Level of Service				D	D	C		B			A	A
Approach Delay (s)		0.0			41.6			14.5			6.1	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	66	185	0	554	1057	0
Future Volume (vph)	66	185	0	554	1057	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.91	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3367	1502		3725	3689	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3367	1502		3725	3689	
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.86	0.86
Adj. Flow (vph)	73	203	0	622	1229	0
RTOR Reduction (vph)	95	94	0	0	0	0
Lane Group Flow (vph)	80	7	0	622	1229	0
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	9.0	9.0		113.0	113.0	
Effective Green, g (s)	9.0	9.0		113.0	113.0	
Actuated g/C Ratio	0.07	0.07		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	226	100		3141	3110	
v/s Ratio Prot	c0.02	0.00		0.17	c0.33	
v/s Ratio Perm						
v/c Ratio	0.35	0.07		0.20	0.40	
Uniform Delay, d1	59.7	58.6		2.0	2.5	
Progression Factor	1.00	1.00		3.05	0.38	
Incremental Delay, d2	1.1	0.3		0.1	0.3	
Delay (s)	60.8	58.9		6.2	1.3	
Level of Service	E	E		A	A	
Approach Delay (s)	60.1			6.2	1.3	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1534	39	4	586	4	5
Future Volume (Veh/h)	1534	39	4	586	4	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.60	0.60
Hourly flow rate (vph)	1763	45	5	689	7	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.79		0.84	0.79
vC, conflicting volume			1808		2140	904
vC1, stage 1 conf vol					1786	
vC2, stage 2 conf vol					354	
vCu, unblocked vol			1495		1496	353
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	98
cM capacity (veh/h)			352		138	509

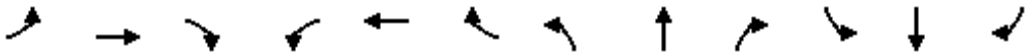
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1175	633	5	344	344	15
Volume Left	0	0	5	0	0	7
Volume Right	0	45	0	0	0	8
cSH	1700	1700	352	1700	1700	225
Volume to Capacity	0.69	0.37	0.01	0.20	0.20	0.07
Queue Length 95th (ft)	0	0	1	0	0	5
Control Delay (s)	0.0	0.0	15.4	0.0	0.0	22.1
Lane LOS			C			C
Approach Delay (s)	0.0		0.1			22.1
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	948	6	0	554	0	3
Future Volume (Veh/h)	948	6	0	554	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1077	7	0	602	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.72		0.79	0.72
vC, conflicting volume			1084		1682	542
vC1, stage 1 conf vol					1080	
vC2, stage 2 conf vol					602	
vCu, unblocked vol			320		771	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			874		422	775

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	718	366	0	602	4
Volume Left	0	0	0	0	0
Volume Right	0	7	0	0	4
cSH	1700	1700	1700	1700	775
Volume to Capacity	0.42	0.22	0.00	0.35	0.01
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.7
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.7
Approach LOS					A

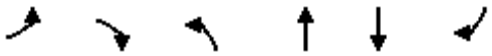
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	67	23	31	28	37	24	106	64	63	72	3
Future Volume (vph)	14	67	23	31	28	37	24	106	64	63	72	3
Peak Hour Factor	0.95	0.95	0.95	0.75	0.75	0.75	0.82	0.82	0.82	0.74	0.74	0.74
Hourly flow rate (vph)	15	71	24	41	37	49	29	129	78	85	97	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	15	95	41	86	29	207	85	101
Volume Left (vph)	15	0	41	0	29	0	85	0
Volume Right (vph)	0	24	0	49	0	78	0	4
Hadj (s)	0.53	-0.14	0.64	-0.26	0.57	-0.20	0.53	0.01
Departure Headway (s)	6.3	5.6	6.3	5.4	5.9	5.2	5.9	5.4
Degree Utilization, x	0.03	0.15	0.07	0.13	0.05	0.30	0.14	0.15
Capacity (veh/h)	536	604	532	619	582	670	580	636
Control Delay (s)	8.2	8.3	8.6	8.0	8.0	9.1	8.7	8.2
Approach Delay (s)	8.3		8.2		9.0		8.4	
Approach LOS	A		A		A		A	

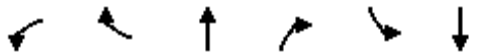
Intersection Summary					
Delay	8.6				
Level of Service	A				
Intersection Capacity Utilization	33.0%	ICU Level of Service		A	
Analysis Period (min)	15				



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	71	7	47	56	6	16
Future Volume (vph)	71	7	47	56	6	16
Peak Hour Factor	0.73	0.73	0.72	0.72	0.88	0.88
Hourly flow rate (vph)	97	10	65	78	7	18

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	97	10	65	78	25
Volume Left (vph)	97	0	65	0	0
Volume Right (vph)	0	10	0	0	18
Hadj (s)	0.53	-0.67	0.53	0.03	-0.40
Departure Headway (s)	5.5	4.3	5.4	4.9	4.4
Degree Utilization, x	0.15	0.01	0.10	0.11	0.03
Capacity (veh/h)	632	810	653	719	797
Control Delay (s)	8.2	6.1	7.7	7.2	7.5
Approach Delay (s)	8.0		7.5		7.5
Approach LOS	A		A		A

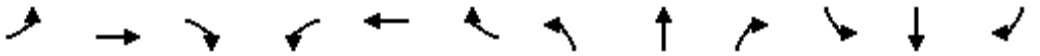
Intersection Summary			
Delay	7.7		
Level of Service	A		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	4	943	24	21	706
Future Volume (Veh/h)	11	4	943	24	21	706
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	18	7	993	25	23	776
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.95					
vC, conflicting volume	1440	509			1018	
vC1, stage 1 conf vol	1006					
vC2, stage 2 conf vol	434					
vCu, unblocked vol	1358	509			1018	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			97	
cM capacity (veh/h)	292	509			677	

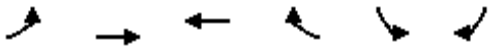
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	18	7	662	356	23	388	388
Volume Left	18	0	0	0	23	0	0
Volume Right	0	7	0	25	0	0	0
cSH	292	509	1700	1700	677	1700	1700
Volume to Capacity	0.06	0.01	0.39	0.21	0.03	0.23	0.23
Queue Length 95th (ft)	5	1	0	0	3	0	0
Control Delay (s)	18.1	12.2	0.0	0.0	10.5	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	16.5		0.0		0.3		
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1558	18	3	572	15	15	5	10	5	2	24
Future Volume (vph)	30	1558	18	3	572	15	15	5	10	5	2	24
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	3647		1845	3675		1863	1759		1863	1687	
Flt Permitted	0.41	1.00		0.10	1.00		0.73	1.00		0.75	1.00	
Satd. Flow (perm)	793	3647		191	3675		1429	1759		1465	1687	
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	34	1791	21	3	609	16	16	5	11	8	3	40
RTOR Reduction (vph)	0	0	0	0	1	0	0	10	0	0	38	0
Lane Group Flow (vph)	34	1812	0	3	624	0	16	6	0	8	5	0
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	114.3	108.6		105.1	104.0		6.3	6.3		6.3	6.3	
Effective Green, g (s)	114.3	108.6		105.1	104.0		6.3	6.3		6.3	6.3	
Actuated g/C Ratio	0.85	0.81		0.78	0.78		0.05	0.05		0.05	0.05	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	720	2955		163	2852		67	82		68	79	
v/s Ratio Prot	c0.00	c0.50		0.00	0.17			0.00			0.00	
v/s Ratio Perm	0.04			0.01			c0.01			0.01		
v/c Ratio	0.05	0.61		0.02	0.22		0.24	0.07		0.12	0.06	
Uniform Delay, d1	1.6	4.8		10.0	4.0		61.5	61.0		61.2	61.0	
Progression Factor	1.00	1.00		0.90	0.93		0.98	0.94		0.96	0.93	
Incremental Delay, d2	0.0	1.0		0.0	0.1		1.8	0.3		0.8	0.3	
Delay (s)	1.7	5.7		9.1	3.9		61.9	57.6		59.4	57.0	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		5.7			3.9			59.8			57.4	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	23	30	9	43	0
Future Volume (Veh/h)	0	23	30	9	43	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	25	33	10	47	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	43				63	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43				63	38
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1566				943	1034

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	25	43	47
Volume Left	0	0	47
Volume Right	0	10	0
cSH	1566	1700	943
Volume to Capacity	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	60	6	10	20	19	28
Future Volume (Veh/h)	60	6	10	20	19	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	7	11	22	21	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			72		112	68
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			72		112	68
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1528		878	995

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	72	33	51
Volume Left	0	11	21
Volume Right	7	0	30
cSH	1700	1528	943
Volume to Capacity	0.04	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	2.5	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.5	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	173	2	4	62	6	9
Future Volume (Veh/h)	173	2	4	62	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	2	4	67	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked						
vC, conflicting volume			190		264	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		264	189
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1384		723	853

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	190	71	17
Volume Left	0	4	7
Volume Right	2	0	10
cSH	1700	1384	794
Volume to Capacity	0.11	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.5	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		18.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	3	1331	17	5	1002
Future Volume (Veh/h)	9	3	1331	17	5	1002
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.88	0.88
Hourly flow rate (vph)	10	3	1548	20	6	1139
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.84	0.78			0.78	
vC, conflicting volume	2140	526			1568	
vC1, stage 1 conf vol	1558					
vC2, stage 2 conf vol	582					
vCu, unblocked vol	950	0			737	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	328	845			669	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	13	619	619	330	6	570	570
Volume Left	10	0	0	0	6	0	0
Volume Right	3	0	0	20	0	0	0
cSH	382	1700	1700	1700	669	1700	1700
Volume to Capacity	0.03	0.36	0.36	0.19	0.01	0.34	0.34
Queue Length 95th (ft)	3	0	0	0	1	0	0
Control Delay (s)	14.8	0.0	0.0	0.0	10.4	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	14.8	0.0			0.1		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	819	17	5	558	57	18
Future Volume (Veh/h)	819	17	5	558	57	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	881	18	6	627	62	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.80	
vC, conflicting volume			899		1520	881
vC1, stage 1 conf vol					881	
vC2, stage 2 conf vol					639	
vCu, unblocked vol			899		1525	881
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		81	94
cM capacity (veh/h)			747		328	346

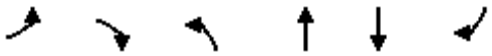
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	881	18	6	627	82
Volume Left	0	0	6	0	62
Volume Right	0	18	0	0	20
cSH	1700	1700	747	1700	433
Volume to Capacity	0.52	0.01	0.01	0.37	0.19
Queue Length 95th (ft)	0	0	1	0	17
Control Delay (s)	0.0	0.0	9.9	0.0	17.9
Lane LOS			A		C
Approach Delay (s)	0.0		0.1		17.9
Approach LOS					C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	804	33	0	563	0	2
Future Volume (Veh/h)	804	33	0	563	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	865	35	0	633	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.80	
vC, conflicting volume			900		1516	450
vC1, stage 1 conf vol					882	
vC2, stage 2 conf vol					633	
vCu, unblocked vol			900		1519	450
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			738		300	556

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	577	323	633	2
Volume Left	0	0	0	0
Volume Right	0	35	0	2
cSH	1700	1700	1700	556
Volume to Capacity	0.34	0.19	0.37	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	11.5
Lane LOS				B
Approach Delay (s)	0.0		0.0	11.5
Approach LOS				B

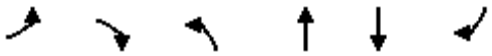
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	33	501	225	14
Future Volume (Veh/h)	15	13	33	501	225	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	16	14	35	527	265	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	870	273	281			
vC1, stage 1 conf vol	273					
vC2, stage 2 conf vol	597					
vCu, unblocked vol	823	181	189			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	97			
cM capacity (veh/h)	494	802	1288			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	16	14	35	527	281
Volume Left	16	0	35	0	0
Volume Right	0	14	0	0	16
cSH	494	802	1288	1700	1700
Volume to Capacity	0.03	0.02	0.03	0.31	0.17
Queue Length 95th (ft)	3	1	2	0	0
Control Delay (s)	12.5	9.6	7.9	0.0	0.0
Lane LOS	B	A	A		
Approach Delay (s)	11.2		0.5		0.0
Approach LOS	B				

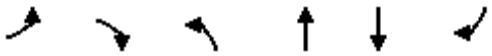
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	15	5	978	718	8
Future Volume (Veh/h)	30	15	5	978	718	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	33	16	6	1099	845	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1411	427	854			
vC1, stage 1 conf vol	850					
vC2, stage 2 conf vol	562					
vCu, unblocked vol	1333	300	748			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	342	663	810			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	33	16	6	550	550	563	291
Volume Left	33	0	6	0	0	0	0
Volume Right	0	16	0	0	0	0	9
cSH	342	663	810	1700	1700	1700	1700
Volume to Capacity	0.10	0.02	0.01	0.32	0.32	0.33	0.17
Queue Length 95th (ft)	8	2	1	0	0	0	0
Control Delay (s)	16.7	10.6	9.5	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	14.7		0.1			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	6	23	27	25	10
Future Volume (Veh/h)	3	6	23	27	25	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	5	10	38	45	42	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	149	30	59			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149	30	59			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	808	1038	1543			

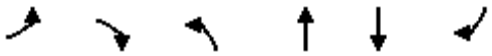
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	10	38	22	22	28	31
Volume Left	5	0	38	0	0	0	0
Volume Right	0	10	0	0	0	0	17
cSH	808	1038	1543	1700	1700	1700	1700
Volume to Capacity	0.01	0.01	0.02	0.01	0.01	0.02	0.02
Queue Length 95th (ft)	0	1	2	0	0	0	0
Control Delay (s)	9.5	8.5	7.4	0.0	0.0	0.0	0.0
Lane LOS	A	A	A				
Approach Delay (s)	8.8		3.4			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	451	169	0	1391
Future Volume (Veh/h)	0	0	451	169	0	1391
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.81	0.81	0.95	0.95
Hourly flow rate (vph)	0	0	557	209	0	1464
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.94					
vC, conflicting volume	1045	278			766	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826	278			766	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	292	719			837	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	278	278	209	488	488	488
Volume Left	0	0	0	0	0	0
Volume Right	0	0	209	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.16	0.12	0.29	0.29	0.29
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	620	1057	334
Future Volume (Veh/h)	0	0	0	620	1057	334
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	0	697	1229	388
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.95	0.94	0.94			
vC, conflicting volume	1578	614	1617			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1367	459	1527			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	132	515	406			

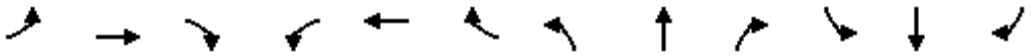
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	348	348	614	614	388
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	388
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.20	0.36	0.36	0.23
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	554	881	0	1242
Future Volume (Veh/h)	0	0	554	881	0	1242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	622	990	0	1444
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.93					
vC, conflicting volume	1103	311			1612	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	855	311			1612	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	277	685			396	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	311	311	990	481	481	481
Volume Left	0	0	0	0	0	0
Volume Right	0	0	990	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.58	0.28	0.28	0.28
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

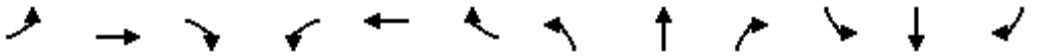
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	317	229	243	602	190	217	692	91	151	741	319
Future Volume (vph)	222	317	229	243	602	190	217	692	91	151	741	319
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.96		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3491		1863	3580		1863	3653		1863	3547	
Flt Permitted	0.18	1.00		0.20	1.00		0.10	1.00		0.15	1.00	
Satd. Flow (perm)	346	3491		393	3580		195	3653		303	3547	
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	249	356	257	261	647	204	238	760	100	159	780	336
RTOR Reduction (vph)	0	116	0	0	25	0	0	8	0	0	39	0
Lane Group Flow (vph)	249	497	0	261	826	0	238	852	0	159	1077	0
Confl. Peds. (#/hr)	1					1			3	3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	36.1	22.7		50.7	30.7		52.9	40.3		52.9	40.3	
Effective Green, g (s)	36.1	22.7		50.7	30.7		52.9	40.3		52.9	40.3	
Actuated g/C Ratio	0.29	0.18		0.41	0.25		0.43	0.33		0.43	0.33	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	644		417	893		254	1196		290	1162	
v/s Ratio Prot	c0.10	0.14		c0.11	c0.23		c0.10	0.23		0.06	0.30	
v/s Ratio Perm	0.17			0.15			c0.31			0.18		
v/c Ratio	0.94	0.77		0.63	0.93		0.94	0.71		0.55	0.93	
Uniform Delay, d1	50.9	47.7		38.4	45.0		50.2	36.3		41.6	39.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.93	0.94	
Incremental Delay, d2	37.9	5.7		2.9	15.0		39.3	3.6		2.0	13.3	
Delay (s)	88.8	53.4		41.3	60.1		89.4	39.9		40.6	50.9	
Level of Service	F	D		D	E		F	D		D	D	
Approach Delay (s)		63.6			55.7			50.6			49.6	
Approach LOS		E			E			D			D	

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)	123.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

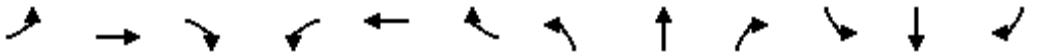
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	540	86	208	855	462	178	939	140	249	714	240
Future Volume (vph)	228	540	86	208	855	462	178	939	140	249	714	240
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3649		1863	3725	1667	1863	3653		1863	3585	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3649		1863	3725	1667	1863	3653		1863	3585	
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	259	614	98	226	929	502	193	1021	152	262	752	253
RTOR Reduction (vph)	0	9	0	0	0	0	0	9	0	0	25	0
Lane Group Flow (vph)	259	703	0	226	929	502	193	1164	0	262	981	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	21.6	39.0		15.0	32.4	48.3	16.3	40.9		15.9	40.5	
Effective Green, g (s)	21.6	39.0		15.0	32.4	48.3	16.3	40.9		15.9	40.5	
Actuated g/C Ratio	0.16	0.29		0.11	0.24	0.36	0.12	0.30		0.12	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	298	1054		207	894	596	224	1106		219	1075	
v/s Ratio Prot	0.14	c0.19		c0.12	c0.25	0.10	0.10	c0.32		c0.14	0.27	
v/s Ratio Perm						0.20						
v/c Ratio	0.87	0.67		1.09	1.04	0.84	0.86	1.05		1.20	0.91	
Uniform Delay, d1	55.3	42.3		60.0	51.3	39.8	58.2	47.0		59.5	45.5	
Progression Factor	1.04	0.89		1.14	0.95	0.84	0.95	0.85		0.87	0.68	
Incremental Delay, d2	22.2	3.2		85.0	38.7	9.3	25.1	40.6		118.8	9.8	
Delay (s)	79.6	40.8		153.4	87.4	42.6	80.5	80.4		170.7	40.6	
Level of Service	E	D		F	F	D	F	F		F	D	
Approach Delay (s)		51.2			82.9			80.4			67.5	
Approach LOS		D			F			F			E	

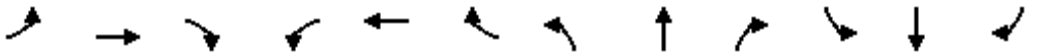
Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	694	75	52	994	169	94	38	56	175	96	165
Future Volume (vph)	99	694	75	52	994	169	94	38	56	175	96	165
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3661		1862	1961	1619	1863	1961	1667	1863	1961	1667
Flt Permitted	0.05	1.00		0.30	1.00	1.00	0.53	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	95	3661		580	1961	1619	1048	1961	1667	1427	1961	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	106	746	81	55	1046	178	111	45	66	199	109	188
RTOR Reduction (vph)	0	5	0	0	0	72	0	0	62	0	0	170
Lane Group Flow (vph)	106	822	0	55	1046	106	111	45	4	199	109	18
Confl. Peds. (#/hr)	3		2	2		3						
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	90.6	82.8		85.8	80.4	80.4	18.2	8.5	8.5	26.6	12.7	12.7
Effective Green, g (s)	90.6	82.8		85.8	80.4	80.4	18.2	8.5	8.5	26.6	12.7	12.7
Actuated g/C Ratio	0.67	0.61		0.64	0.60	0.60	0.13	0.06	0.06	0.20	0.09	0.09
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	165	2245		419	1167	964	199	123	104	326	184	156
v/s Ratio Prot	c0.04	0.22		0.01	c0.53		0.04	0.02		c0.06	0.06	
v/s Ratio Perm	0.39			0.08		0.07	0.03		0.00	c0.06		0.01
v/c Ratio	0.64	0.37		0.13	0.90	0.11	0.56	0.37	0.04	0.61	0.59	0.11
Uniform Delay, d1	54.4	13.0		14.4	23.7	11.8	55.6	60.7	59.4	49.1	58.7	56.0
Progression Factor	0.78	1.04		0.33	0.50	0.15	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.2		0.0	3.2	0.1	3.4	1.8	0.2	3.4	5.0	0.3
Delay (s)	46.9	13.8		4.8	15.1	1.8	58.9	62.5	59.6	52.4	63.7	56.3
Level of Service	D	B		A	B	A	E	E	E	D	E	E
Approach Delay (s)		17.5			12.8			59.9			56.4	
Approach LOS		B			B			E			E	

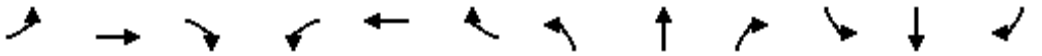
Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	26	433	372	52	45	378	769	222	11	1009	61
Future Volume (vph)	59	26	433	372	52	45	378	769	222	11	1009	61
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	62	27	456	404	57	49	415	845	244	12	1062	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	116	0	0	39
Lane Group Flow (vph)	62	27	456	404	106	0	415	845	128	12	1062	25
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	16.0	16.0	43.4	20.6	20.6		21.4	70.6	70.6	3.0	52.2	52.2
Effective Green, g (s)	16.0	16.0	43.4	20.6	20.6		21.4	70.6	70.6	3.0	52.2	52.2
Actuated g/C Ratio	0.12	0.12	0.32	0.15	0.15		0.16	0.52	0.52	0.02	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	232	942	551	278		572	2799	871	41	2069	644
v/s Ratio Prot	0.03	0.01	c0.16	c0.11	0.06		c0.11	0.16		0.01	c0.20	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.28	0.12	0.48	0.73	0.38		0.73	0.30	0.15	0.29	0.51	0.04
Uniform Delay, d1	54.3	53.2	36.8	54.6	51.5		54.0	18.2	16.6	65.0	31.7	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.63	0.51	0.35	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.4	5.2	1.0		4.2	0.3	0.3	3.9	0.9	0.1
Delay (s)	55.0	53.4	37.2	59.8	52.5		38.3	9.5	6.2	68.9	32.6	25.9
Level of Service	D	D	D	E	D		D	A	A	E	C	C
Approach Delay (s)		40.0			58.3			16.9			32.6	
Approach LOS		D			E			B			C	

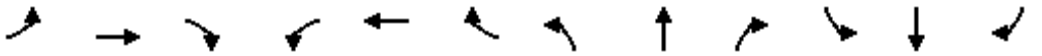
Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	461	227	77	858	102	252	223	47	170	390	153
Future Volume (vph)	104	461	227	77	858	102	252	223	47	170	390	153
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1632	1863	1961	1667	1863	1961	1667
Flt Permitted	0.07	1.00	1.00	0.30	1.00	1.00	0.12	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	138	1961	1667	581	1961	1632	234	1961	1667	827	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	109	485	239	81	903	107	283	251	53	205	470	184
RTOR Reduction (vph)	0	0	89	0	0	52	0	0	37	0	0	54
Lane Group Flow (vph)	109	485	150	81	903	55	283	251	16	205	470	130
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	64.2	56.8	69.8	63.8	56.6	69.1	46.5	33.5	40.7	45.5	33.0	40.4
Effective Green, g (s)	64.2	56.8	69.8	63.8	56.6	69.1	46.5	33.5	40.7	45.5	33.0	40.4
Actuated g/C Ratio	0.48	0.42	0.52	0.47	0.42	0.51	0.34	0.25	0.30	0.34	0.24	0.30
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	160	825	861	342	822	835	237	486	502	374	479	498
v/s Ratio Prot	c0.04	0.25	0.02	0.01	c0.46	0.01	c0.11	0.13	0.00	0.05	0.24	0.01
v/s Ratio Perm	0.29		0.07	0.10		0.03	c0.30		0.01	0.13		0.06
v/c Ratio	0.68	0.59	0.17	0.24	1.10	0.07	1.19	0.52	0.03	0.55	0.98	0.26
Uniform Delay, d1	30.7	30.1	17.3	21.6	39.2	16.6	37.2	43.8	33.3	33.8	50.7	36.0
Progression Factor	1.10	0.82	1.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	2.9	0.1	0.4	61.8	0.0	121.1	1.1	0.0	1.6	36.2	0.3
Delay (s)	44.4	27.5	32.0	22.0	101.0	16.7	158.3	44.8	33.3	35.4	86.8	36.2
Level of Service	D	C	C	C	F	B	F	D	C	D	F	D
Approach Delay (s)		31.0			86.9			98.5			63.7	
Approach LOS		C			F			F			E	

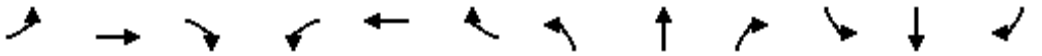
Intersection Summary			
HCM 2000 Control Delay	69.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	15	40	50	16	528	37	1347	63	461	1390	104
Future Volume (vph)	139	15	40	50	16	528	37	1347	63	461	1390	104
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3428	1667		1890	2933	1863	5317		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3428	1667		1890	2933	1863	5317		3614	3725	1667
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	172	19	49	58	19	614	42	1513	71	485	1463	109
RTOR Reduction (vph)	0	0	43	0	0	87	0	3	0	0	0	33
Lane Group Flow (vph)	86	105	6	0	77	527	42	1581	0	485	1463	76
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	10.7	10.7	16.7		10.1	43.0	6.0	56.5		32.9	83.4	94.1
Effective Green, g (s)	10.7	10.7	16.7		10.1	43.0	6.0	56.5		32.9	83.4	94.1
Actuated g/C Ratio	0.08	0.08	0.12		0.07	0.32	0.04	0.42		0.24	0.62	0.70
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	134	271	206		141	1073	82	2225		880	2301	1161
v/s Ratio Prot	c0.05	0.03	0.00		0.04	c0.12	0.02	c0.30		0.13	c0.39	0.01
v/s Ratio Perm			0.00			0.06						0.04
v/c Ratio	0.64	0.39	0.03		0.55	0.49	0.51	0.71		0.55	0.64	0.07
Uniform Delay, d1	60.3	59.0	52.0		60.2	37.2	63.1	32.5		44.6	16.2	6.5
Progression Factor	1.01	1.01	1.00		1.00	1.00	0.85	1.07		0.92	0.85	1.28
Incremental Delay, d2	10.1	0.9	0.1		5.3	0.4	2.0	0.7		0.7	1.1	0.0
Delay (s)	70.8	60.3	52.1		65.6	37.6	55.8	35.5		41.8	14.8	8.3
Level of Service	E	E	D		E	D	E	D		D	B	A
Approach Delay (s)		62.4			40.7			36.0			20.8	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

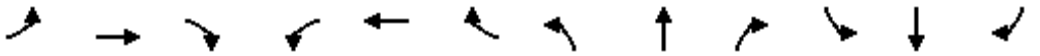
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	62	74	4	35	110	1159	53	56	867	42
Future Volume (vph)	42	1	62	74	4	35	110	1159	53	56	867	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1672		1863	1961	1667	1863	3701		1863	3700	
Flt Permitted	0.75	1.00		0.63	1.00	1.00	0.25	1.00		0.16	1.00	
Satd. Flow (perm)	1478	1672		1234	1961	1667	499	3701		323	3700	
Peak-hour factor, PHF	0.60	0.60	0.60	0.72	0.72	0.72	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	70	2	103	103	6	49	121	1274	58	62	953	46
RTOR Reduction (vph)	0	91	0	0	0	43	0	2	0	0	2	0
Lane Group Flow (vph)	70	14	0	103	6	6	121	1330	0	62	997	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	15.9	15.9		15.9	15.9	15.9	103.4	96.3		98.8	94.0	
Effective Green, g (s)	15.9	15.9		15.9	15.9	15.9	103.4	96.3		98.8	94.0	
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12	0.77	0.71		0.73	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	174	196		145	230	196	453	2640		291	2576	
v/s Ratio Prot		0.01			0.00		c0.01	c0.36		0.01	0.27	
v/s Ratio Perm	0.05			c0.08		0.00	0.19			0.15		
v/c Ratio	0.40	0.07		0.71	0.03	0.03	0.27	0.50		0.21	0.39	
Uniform Delay, d1	55.1	53.0		57.3	52.7	52.7	8.5	8.7		13.2	8.5	
Progression Factor	1.03	1.13		1.00	1.00	1.00	1.00	1.00		0.93	0.91	
Incremental Delay, d2	1.5	0.2		15.1	0.0	0.1	0.3	0.7		0.1	0.2	
Delay (s)	58.1	60.0		72.4	52.7	52.8	8.8	9.4		12.4	7.9	
Level of Service	E	E		E	D	D	A	A		B	A	
Approach Delay (s)		59.2			65.6			9.3			8.2	
Approach LOS		E			E			A			A	

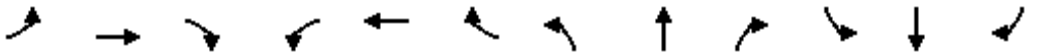
Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	60	7	0	36	43	1204	2	2	1104	56
Future Volume (vph)	40	0	60	7	0	36	43	1204	2	2	1104	56
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1600		1863	3725		1863	3698	
Flt Permitted	0.83	1.00			0.93		0.22	1.00		0.19	1.00	
Satd. Flow (perm)	1632	1667			1492		427	3725		372	3698	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	52	0	78	9	0	46	48	1338	2	2	1162	59
RTOR Reduction (vph)	0	73	0	0	43	0	0	0	0	0	2	0
Lane Group Flow (vph)	52	5	0	0	12	0	48	1340	0	2	1219	0
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Effective Green, g (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Actuated g/C Ratio	0.07	0.07			0.07		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	112			100		357	3116		311	3093	
v/s Ratio Prot		0.00						c0.36			0.33	
v/s Ratio Perm	c0.03				0.01		0.11			0.01		
v/c Ratio	0.47	0.05			0.12		0.13	0.43		0.01	0.39	
Uniform Delay, d1	55.2	53.7			53.9		1.9	2.6		1.7	2.4	
Progression Factor	1.00	1.00			1.00		0.12	0.10		1.00	1.00	
Incremental Delay, d2	3.2	0.2			0.5		0.6	0.3		0.0	0.4	
Delay (s)	58.4	53.8			54.5		0.8	0.6		1.7	2.8	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		55.7			54.5			0.6			2.8	
Approach LOS		E			D			A			A	

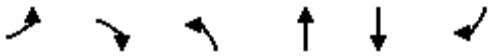
Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	576	417	349	0	1175	0	0	1409	479
Future Volume (vph)	0	0	0	576	417	349	0	1175	0	0	1409	479
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	606	439	367	0	1263	0	0	1483	504
RTOR Reduction (vph)	0	0	0	0	0	32	0	0	0	0	0	75
Lane Group Flow (vph)	0	0	0	606	439	335	0	1263	0	0	1483	429
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				37.8	37.8	50.8		71.9			84.9	84.9
Effective Green, g (s)				37.8	37.8	50.8		71.9			84.9	84.9
Actuated g/C Ratio				0.28	0.28	0.38		0.53			0.63	0.63
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1011	549	1103		2850			3366	1048
v/s Ratio Prot				0.17	c0.22	0.11		0.24			c0.28	0.26
v/s Ratio Perm												
v/c Ratio				0.60	0.80	0.30		0.44			0.44	0.41
Uniform Delay, d1				42.0	45.1	29.6		19.3			12.9	12.5
Progression Factor				1.00	1.00	1.00		0.82			0.89	0.88
Incremental Delay, d2				1.0	8.0	0.2		0.4			0.4	1.0
Delay (s)				43.0	53.1	29.8		16.2			11.8	12.0
Level of Service				D	D	C		B			B	B
Approach Delay (s)		0.0			42.7			16.2			11.8	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	285	359	0	1333	1596	0
Future Volume (vph)	285	359	0	1333	1596	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3490	1517		3725	3725	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3490	1517		3725	3725	
Peak-hour factor, PHF	0.94	0.94	0.86	0.86	0.94	0.94
Adj. Flow (vph)	303	382	0	1550	1698	0
RTOR Reduction (vph)	34	34	0	0	0	0
Lane Group Flow (vph)	433	184	0	1550	1698	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	23.1	23.1		99.9	99.9	
Effective Green, g (s)	23.1	23.1		99.9	99.9	
Actuated g/C Ratio	0.17	0.17		0.74	0.74	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	597	259		2756	2756	
v/s Ratio Prot	c0.12	0.12		0.42	c0.46	
v/s Ratio Perm						
v/c Ratio	0.73	0.71		0.56	0.62	
Uniform Delay, d1	52.9	52.8		7.8	8.4	
Progression Factor	1.00	1.00		0.26	0.65	
Incremental Delay, d2	4.5	9.1		0.6	0.9	
Delay (s)	57.5	61.9		2.7	6.4	
Level of Service	E	E		A	A	
Approach Delay (s)	58.9			2.7	6.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	838	19	7	1266	16	16
Future Volume (Veh/h)	838	19	7	1266	16	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.63	0.63
Hourly flow rate (vph)	952	22	8	1376	25	25
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.92		0.80	0.92
vC, conflicting volume			974		1668	487
vC1, stage 1 conf vol					963	
vC2, stage 2 conf vol					705	
vCu, unblocked vol			804		906	276
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	96
cM capacity (veh/h)			753		357	665

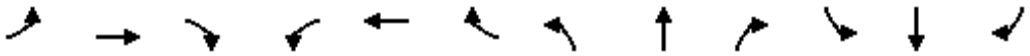
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	635	339	8	688	688	50
Volume Left	0	0	8	0	0	25
Volume Right	0	22	0	0	0	25
cSH	1700	1700	753	1700	1700	465
Volume to Capacity	0.37	0.20	0.01	0.40	0.40	0.11
Queue Length 95th (ft)	0	0	1	0	0	9
Control Delay (s)	0.0	0.0	9.8	0.0	0.0	13.7
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			13.7
Approach LOS						B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	873	3	15	1023	5	2
Future Volume (Veh/h)	873	3	15	1023	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.88	0.88
Hourly flow rate (vph)	919	3	16	1077	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.86		0.56	0.86
vC, conflicting volume			922		2030	461
vC1, stage 1 conf vol					920	
vC2, stage 2 conf vol					1109	
vCu, unblocked vol			579		1496	41
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	100
cM capacity (veh/h)			851		197	876

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	613	309	16	1077	8
Volume Left	0	0	16	0	6
Volume Right	0	3	0	0	2
cSH	1700	1700	851	1700	244
Volume to Capacity	0.36	0.18	0.02	0.63	0.03
Queue Length 95th (ft)	0	0	1	0	3
Control Delay (s)	0.0	0.0	9.3	0.0	20.2
Lane LOS			A		C
Approach Delay (s)	0.0		0.1		20.2
Approach LOS					C

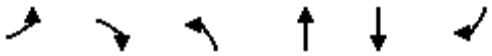
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	75	133	158	153	168	110	124	29	39	152	9
Future Volume (vph)	4	75	133	158	153	168	110	124	29	39	152	9
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90
Hourly flow rate (vph)	5	86	153	195	189	207	128	144	34	43	169	10

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	5	239	195	396	128	178	43	179
Volume Left (vph)	5	0	195	0	128	0	43	0
Volume Right (vph)	0	153	0	207	0	34	0	10
Hadj (s)	0.53	-0.41	0.53	-0.33	0.53	-0.10	0.53	-0.01
Departure Headway (s)	7.7	6.7	7.2	6.3	7.7	7.1	7.9	7.4
Degree Utilization, x	0.01	0.45	0.39	0.69	0.28	0.35	0.09	0.37
Capacity (veh/h)	440	510	486	552	442	480	427	462
Control Delay (s)	9.6	13.8	13.4	21.1	12.5	12.7	10.5	13.3
Approach Delay (s)	13.7		18.6		12.6		12.8	
Approach LOS	B		C		B		B	

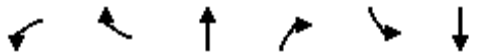
Intersection Summary				
Delay	15.4			
Level of Service	C			
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	111	24	21	29	43	115
Future Volume (vph)	111	24	21	29	43	115
Peak Hour Factor	0.95	0.95	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	117	25	24	34	47	125

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	117	25	24	34	172
Volume Left (vph)	117	0	24	0	0
Volume Right (vph)	0	25	0	0	125
Hadj (s)	0.53	-0.67	0.57	0.07	-0.40
Departure Headway (s)	5.6	4.4	5.6	5.1	4.4
Degree Utilization, x	0.18	0.03	0.04	0.05	0.21
Capacity (veh/h)	616	781	616	675	790
Control Delay (s)	8.6	6.3	7.6	7.2	8.5
Approach Delay (s)	8.2		7.4		8.5
Approach LOS	A		A		A

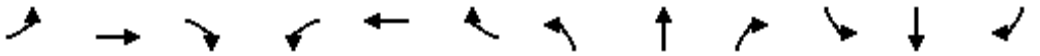
Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	14	1174	22	3	1151
Future Volume (Veh/h)	23	14	1174	22	3	1151
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	26	16	1290	24	3	1212
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.89					
vC, conflicting volume	1914	658			1314	
vC1, stage 1 conf vol	1302					
vC2, stage 2 conf vol	612					
vCu, unblocked vol	1775	658			1314	
tC, single (s)	6.9	7.0			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	199	397			522	

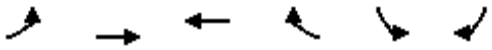
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	26	16	860	454	3	606	606
Volume Left	26	0	0	0	3	0	0
Volume Right	0	16	0	24	0	0	0
cSH	199	397	1700	1700	522	1700	1700
Volume to Capacity	0.13	0.04	0.51	0.27	0.01	0.36	0.36
Queue Length 95th (ft)	11	3	0	0	0	0	0
Control Delay (s)	25.8	14.4	0.0	0.0	11.9	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	21.5		0.0		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	786	22	16	1262	4	19	7	12	59	8	61
Future Volume (vph)	16	786	22	16	1262	4	19	7	12	59	8	61
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3711		1845	3688		1863	1779		1863	1700	
Flt Permitted	0.16	1.00		0.31	1.00		0.57	1.00		0.74	1.00	
Satd. Flow (perm)	307	3711		605	3688		1125	1779		1458	1700	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	17	836	23	18	1402	4	21	8	13	98	13	102
RTOR Reduction (vph)	0	1	0	0	0	0	0	12	0	0	91	0
Lane Group Flow (vph)	17	858	0	18	1406	0	21	9	0	98	24	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	102.9	100.7		102.9	100.7		14.1	14.1		14.1	14.1	
Effective Green, g (s)	102.9	100.7		102.9	100.7		14.1	14.1		14.1	14.1	
Actuated g/C Ratio	0.76	0.75		0.76	0.75		0.10	0.10		0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	2768		481	2750		117	185		152	177	
v/s Ratio Prot	c0.00	0.23		0.00	c0.38			0.01			0.01	
v/s Ratio Perm	0.05			0.03			0.02			c0.07		
v/c Ratio	0.07	0.31		0.04	0.51		0.18	0.05		0.64	0.13	
Uniform Delay, d1	9.7	5.7		5.4	7.0		55.2	54.4		58.0	54.9	
Progression Factor	1.00	1.00		0.64	0.64		0.97	0.95		1.04	1.14	
Incremental Delay, d2	0.1	0.3		0.0	0.2		0.7	0.1		9.0	0.3	
Delay (s)	9.8	6.0		3.4	4.7		54.0	51.7		69.1	63.1	
Level of Service	A	A		A	A		D	D		E	E	
Approach Delay (s)		6.0			4.7			52.8			65.9	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	46	38	32	26	0
Future Volume (Veh/h)	0	46	38	32	26	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	50	41	35	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	76				108	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				108	58
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1523				889	1007

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	50	76	28
Volume Left	0	0	28
Volume Right	0	35	0
cSH	1523	1700	889
Volume to Capacity	0.00	0.04	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	45	27	46	48	22	36
Future Volume (Veh/h)	45	27	46	48	22	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	29	50	52	24	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			78		216	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			78		216	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	96
cM capacity (veh/h)			1520		747	1001

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	78	102	63
Volume Left	0	50	24
Volume Right	29	0	39
cSH	1700	1520	886
Volume to Capacity	0.05	0.03	0.07
Queue Length 95th (ft)	0	3	6
Control Delay (s)	0.0	3.8	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.8	9.4
Approach LOS			A

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	93	9	16	140	7	12
Future Volume (Veh/h)	93	9	16	140	7	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	10	17	152	8	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					0.99	
vC, conflicting volume			111		292	106
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			111		276	106
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1479		696	948

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	111	169	21
Volume Left	0	17	8
Volume Right	10	0	13
cSH	1700	1479	833
Volume to Capacity	0.07	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	0.8	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	9	1438	19	9	1471
Future Volume (Veh/h)	19	9	1438	19	9	1471
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	21	10	1616	21	9	1548
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.86	0.77			0.77	
vC, conflicting volume	2418	549			1637	
vC1, stage 1 conf vol	1626					
vC2, stage 2 conf vol	792					
vCu, unblocked vol	704	0			771	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			99	
cM capacity (veh/h)	318	833			644	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	646	646	344	9	774	774
Volume Left	21	0	0	0	9	0	0
Volume Right	10	0	0	21	0	0	0
cSH	397	1700	1700	1700	644	1700	1700
Volume to Capacity	0.08	0.38	0.38	0.20	0.01	0.46	0.46
Queue Length 95th (ft)	6	0	0	0	1	0	0
Control Delay (s)	14.8	0.0	0.0	0.0	10.7	0.0	0.0
Lane LOS	B				B		
Approach Delay (s)	14.8	0.0			0.1		
Approach LOS	B						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	799	57	15	1248	32	10
Future Volume (Veh/h)	799	57	15	1248	32	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	841	60	16	1314	35	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.45	
vC, conflicting volume			901		2187	841
vC1, stage 1 conf vol					841	
vC2, stage 2 conf vol					1346	
vCu, unblocked vol			901		3021	841
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		71	97
cM capacity (veh/h)			754		121	365

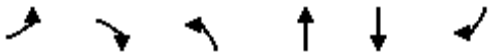
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	841	60	16	1314	46
Volume Left	0	0	16	0	35
Volume Right	0	60	0	0	11
cSH	1700	1700	754	1700	159
Volume to Capacity	0.49	0.04	0.02	0.77	0.29
Queue Length 95th (ft)	0	0	2	0	28
Control Delay (s)	0.0	0.0	9.9	0.0	39.0
Lane LOS			A		E
Approach Delay (s)	0.0		0.1		39.0
Approach LOS					E

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	786	23	0	1263	0	6
Future Volume (Veh/h)	786	23	0	1263	0	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	827	24	0	1329	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.45	
vC, conflicting volume			851		2168	426
vC1, stage 1 conf vol					839	
vC2, stage 2 conf vol					1329	
vCu, unblocked vol			851		2994	426
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			783		112	577

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	551	300	1329	7
Volume Left	0	0	0	0
Volume Right	0	24	0	7
cSH	1700	1700	1700	577
Volume to Capacity	0.32	0.18	0.78	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	11.3
Lane LOS				B
Approach Delay (s)	0.0		0.0	11.3
Approach LOS				B

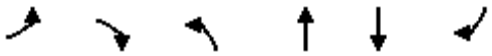
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	30	19	482	685	9
Future Volume (Veh/h)	40	30	19	482	685	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	43	33	21	542	825	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.74	0.74	0.74			
vC, conflicting volume	1414	830	836			
vC1, stage 1 conf vol	830					
vC2, stage 2 conf vol	584					
vCu, unblocked vol	1385	597	604			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	91	97			
cM capacity (veh/h)	335	373	722			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	43	33	21	542	836
Volume Left	43	0	21	0	0
Volume Right	0	33	0	0	11
cSH	335	373	722	1700	1700
Volume to Capacity	0.13	0.09	0.03	0.32	0.49
Queue Length 95th (ft)	11	7	2	0	0
Control Delay (s)	17.3	15.6	10.1	0.0	0.0
Lane LOS	C	C	B		
Approach Delay (s)	16.6		0.4		0.0
Approach LOS	C				

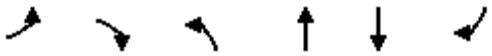
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	9	15	1232	1141	30
Future Volume (Veh/h)	17	9	15	1232	1141	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	18	10	17	1369	1201	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1936	616	1233			
vC1, stage 1 conf vol	1217					
vC2, stage 2 conf vol	718					
vCu, unblocked vol	1840	403	1074			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	97			
cM capacity (veh/h)	229	548	592			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	10	17	684	684	801	432
Volume Left	18	0	17	0	0	0	0
Volume Right	0	10	0	0	0	0	32
cSH	229	548	592	1700	1700	1700	1700
Volume to Capacity	0.08	0.02	0.03	0.40	0.40	0.47	0.25
Queue Length 95th (ft)	6	1	2	0	0	0	0
Control Delay (s)	22.0	11.7	11.3	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	18.3		0.1			0.0	
Approach LOS	C						

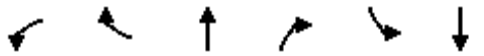
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	93	6	21	35	3
Future Volume (Veh/h)	39	93	6	21	35	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	65	155	10	35	58	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	98	32	63			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	32	63			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	85	99			
cM capacity (veh/h)	885	1035	1538			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	65	155	10	18	18	39	24
Volume Left	65	0	10	0	0	0	0
Volume Right	0	155	0	0	0	0	5
cSH	885	1035	1538	1700	1700	1700	1700
Volume to Capacity	0.07	0.15	0.01	0.01	0.01	0.02	0.01
Queue Length 95th (ft)	6	13	0	0	0	0	0
Control Delay (s)	9.4	9.1	7.4	0.0	0.0	0.0	0.0
Lane LOS	A	A	A				
Approach Delay (s)	9.2		1.6			0.0	
Approach LOS	A						

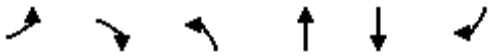
Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1175	443	0	1985
Future Volume (Veh/h)	0	0	1175	443	0	1985
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	0	1263	476	0	2089
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.92	0.85			0.85	
vC, conflicting volume	1959	632			1739	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	931	208			1514	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	245	677			371	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	632	632	476	696	696	696
Volume Left	0	0	0	0	0	0
Volume Right	0	0	476	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.37	0.37	0.28	0.41	0.41	0.41
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1618	1596	389
Future Volume (Veh/h)	0	0	0	1618	1596	389
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	0	1881	1698	414
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.89	0.84	0.84			
vC, conflicting volume	2638	849	2112			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1760	428	1938			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	67	481	250			

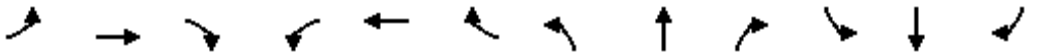
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	940	940	849	849	414
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	414
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.55	0.55	0.50	0.50	0.24
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1333	651	0	1955
Future Volume (Veh/h)	0	0	1333	651	0	1955
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	1550	757	0	2080
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.86	0.75			0.75	
vC, conflicting volume	2243	775			2307	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	656	45			2080	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	341	764			198	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	775	775	757	693	693	693
Volume Left	0	0	0	0	0	0
Volume Right	0	0	757	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.46	0.45	0.41	0.41	0.41
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

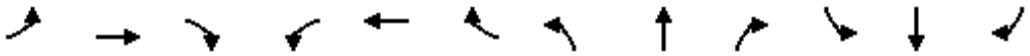
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	252	296	105	113	304	177	153	564	103	154	545	289
Future Volume (vph)	252	296	105	113	304	177	153	564	103	154	545	289
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3579		1863	3520		1863	3640		1863	3532	
Flt Permitted	0.22	1.00		0.29	1.00		0.17	1.00		0.27	1.00	
Satd. Flow (perm)	438	3579		571	3520		342	3640		527	3532	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	286	336	119	120	323	188	170	627	114	173	612	325
RTOR Reduction (vph)	0	34	0	0	80	0	0	13	0	0	59	0
Lane Group Flow (vph)	286	421	0	120	431	0	170	728	0	173	878	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	33.0	17.9		33.6	18.2		49.7	43.1		49.7	43.1	
Effective Green, g (s)	33.0	17.9		33.6	18.2		49.7	43.1		49.7	43.1	
Actuated g/C Ratio	0.30	0.16		0.31	0.17		0.46	0.40		0.46	0.40	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	330	587		358	587		248	1439		321	1396	
v/s Ratio Prot	c0.12	0.12		0.05	0.12		c0.04	0.20		0.03	0.25	
v/s Ratio Perm	c0.14			0.06			c0.27			0.21		
v/c Ratio	0.87	0.72		0.34	0.73		0.69	0.51		0.54	0.63	
Uniform Delay, d1	40.5	43.1		35.6	43.1		36.8	24.9		30.5	26.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.89	0.90	
Incremental Delay, d2	20.5	4.2		0.6	4.7		7.6	1.3		1.7	2.1	
Delay (s)	61.0	47.3		36.2	47.8		44.4	26.2		28.8	26.1	
Level of Service	E	D		D	D		D	C		C	C	
Approach Delay (s)		52.6			45.6			29.6			26.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

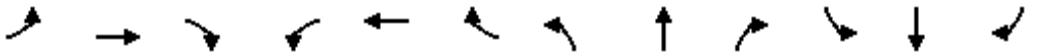
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	462	60	211	549	541	96	804	125	341	736	296
Future Volume (vph)	340	462	60	211	549	541	96	804	125	341	736	296
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3661		1863	3725	1667	1863	3650		1863	3565	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3661		1863	3725	1667	1863	3650		1863	3565	
Peak-hour factor, PHF	0.78	0.78	0.78	0.93	0.93	0.93	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	436	592	77	227	590	582	108	903	140	379	818	329
RTOR Reduction (vph)	0	8	0	0	0	0	0	10	0	0	32	0
Lane Group Flow (vph)	436	661	0	227	590	582	108	1033	0	379	1115	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	33.0	37.0		17.0	21.0	40.9	11.6	33.9		19.9	42.2	
Effective Green, g (s)	33.0	37.0		17.0	21.0	40.9	11.6	33.9		19.9	42.2	
Actuated g/C Ratio	0.25	0.28		0.13	0.16	0.31	0.09	0.26		0.15	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	465	1026		239	592	516	163	937		280	1139	
v/s Ratio Prot	c0.23	0.18		0.12	0.16	c0.17	0.06	c0.28		c0.20	0.31	
v/s Ratio Perm						0.18						
v/c Ratio	0.94	0.64		0.95	1.00	1.13	0.66	1.10		1.35	0.98	
Uniform Delay, d1	48.5	41.7		57.1	55.5	45.5	58.3	49.0		56.0	44.5	
Progression Factor	0.91	0.91		1.12	0.99	0.83	1.20	0.84		0.83	0.70	
Incremental Delay, d2	25.8	3.0		40.1	33.5	77.3	9.0	60.6		177.1	19.0	
Delay (s)	69.9	40.8		103.9	88.4	115.0	79.1	102.0		223.5	50.1	
Level of Service	E	D		F	F	F	E	F		F	D	
Approach Delay (s)		52.3			102.0			99.8			93.1	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	88.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



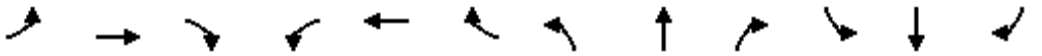
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	788	60	29	836	174	96	38	56	177	36	63
Future Volume (vph)	53	788	60	29	836	174	96	38	56	177	36	63
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3680		1862	1961	1667	1863	1961	1635	1854	1961	1667
Flt Permitted	0.14	1.00		0.27	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	267	3680		537	1961	1667	1428	1961	1635	1423	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	56	829	63	32	919	191	109	43	64	219	44	78
RTOR Reduction (vph)	0	3	0	0	0	75	0	0	60	0	0	74
Lane Group Flow (vph)	56	889	0	32	919	116	109	43	4	219	44	4
Confl. Peds. (#/hr)			1	1					4	4		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	88.5	82.5		83.7	80.1	80.1	22.1	7.8	7.8	20.9	7.2	7.2
Effective Green, g (s)	88.5	82.5		83.7	80.1	80.1	22.1	7.8	7.8	20.9	7.2	7.2
Actuated g/C Ratio	0.67	0.62		0.63	0.61	0.61	0.17	0.06	0.06	0.16	0.05	0.05
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	251	2300		376	1189	1011	286	115	96	270	106	90
v/s Ratio Prot	c0.01	0.24		0.00	c0.47		0.04	0.02		c0.08	0.02	
v/s Ratio Perm	0.14			0.05		0.07	0.02		0.00	c0.04		0.00
v/c Ratio	0.22	0.39		0.09	0.77	0.11	0.38	0.37	0.04	0.81	0.42	0.05
Uniform Delay, d1	34.7	12.2		14.2	19.2	11.0	49.1	59.8	58.6	52.4	60.4	59.1
Progression Factor	1.39	1.09		0.44	0.54	0.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		0.1	3.4	0.2	0.9	2.0	0.2	16.7	2.6	0.2
Delay (s)	48.6	13.5		6.4	13.7	1.3	49.9	61.8	58.7	69.1	63.0	59.4
Level of Service	D	B		A	B	A	D	E	E	E	E	E
Approach Delay (s)		15.6			11.4			54.9			66.1	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	126	778	679	153	41	715	876	513	24	1158	78
Future Volume (vph)	118	126	778	679	153	41	715	876	513	24	1158	78
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	134	828	746	168	45	753	922	540	25	1219	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	281	0	0	61
Lane Group Flow (vph)	126	134	828	746	213	0	753	922	259	25	1219	21
Confl. Peds. (#/hr)						2						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.0	12.0	51.1	28.0	28.0		33.1	63.2	63.2	4.0	34.1	34.1
Effective Green, g (s)	12.0	12.0	51.1	28.0	28.0		33.1	63.2	63.2	4.0	34.1	34.1
Actuated g/C Ratio	0.09	0.09	0.39	0.21	0.21		0.25	0.48	0.48	0.03	0.26	0.26
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	178	1135	766	400		906	2562	798	56	1382	424
v/s Ratio Prot	0.07	0.07	c0.28	c0.21	0.11		c0.21	0.17		0.01	c0.23	
v/s Ratio Perm									0.16			0.01
v/c Ratio	0.75	0.75	0.73	0.97	0.53		0.83	0.36	0.32	0.45	0.88	0.05
Uniform Delay, d1	58.5	58.6	34.5	51.6	46.2		46.8	21.7	21.2	62.9	47.0	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.72	0.47	1.00	1.00	1.00
Incremental Delay, d2	16.3	16.4	2.4	26.1	1.5		4.1	0.2	0.7	5.6	8.4	0.2
Delay (s)	74.8	74.9	36.9	77.7	47.7		42.4	15.8	10.6	68.5	55.4	37.0
Level of Service	E	E	D	E	D		D	B	B	E	E	D
Approach Delay (s)		46.0			71.1			23.6			54.5	
Approach LOS		D			E			C			D	

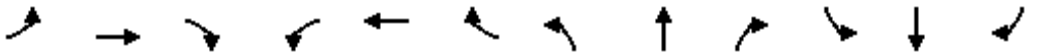
Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	537	199	54	674	102	271	203	44	88	231	101
Future Volume (vph)	97	537	199	54	674	102	271	203	44	88	231	101
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1630	1863	1961	1667	1863	1961	1667
Flt Permitted	0.15	1.00	1.00	0.28	1.00	1.00	0.24	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	291	1961	1667	547	1961	1630	464	1961	1667	910	1961	1667
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	107	590	219	59	741	112	288	216	47	100	262	115
RTOR Reduction (vph)	0	0	87	0	0	48	0	0	36	0	0	90
Lane Group Flow (vph)	107	590	132	59	741	64	288	216	11	100	263	25
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	72.3	66.8	79.8	70.1	65.7	76.0	38.5	25.5	29.9	33.1	22.8	28.3
Effective Green, g (s)	72.3	66.8	79.8	70.1	65.7	76.0	38.5	25.5	29.9	33.1	22.8	28.3
Actuated g/C Ratio	0.55	0.51	0.60	0.53	0.50	0.58	0.29	0.19	0.23	0.25	0.17	0.21
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	224	992	1007	334	976	938	273	378	377	302	338	357
v/s Ratio Prot	c0.02	0.30	0.01	0.01	c0.38	0.01	c0.10	0.11	0.00	0.03	0.13	0.00
v/s Ratio Perm	0.24		0.07	0.09		0.03	c0.20		0.01	0.06		0.01
v/c Ratio	0.48	0.59	0.13	0.18	0.76	0.07	1.05	0.57	0.03	0.33	0.78	0.07
Uniform Delay, d1	21.7	23.0	11.2	17.4	26.8	12.4	42.8	48.3	39.7	39.3	52.2	41.3
Progression Factor	0.75	0.91	3.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.4	0.1	0.3	5.5	0.0	69.7	2.2	0.0	0.6	11.1	0.1
Delay (s)	17.9	23.4	33.9	17.6	32.3	12.4	112.5	50.5	39.8	39.9	63.2	41.4
Level of Service	B	C	C	B	C	B	F	D	D	D	E	D
Approach Delay (s)		25.3			28.9			82.0			53.1	
Approach LOS		C			C			F			D	

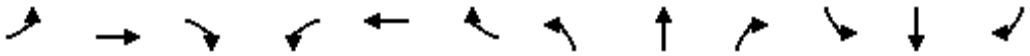
Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	28	59	75	9	603	40	1624	89	637	1346	155
Future Volume (vph)	156	28	59	75	9	603	40	1624	89	637	1346	155
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3442	1667		1877	2933	1863	5311		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3442	1667		1877	2933	1863	5311		3614	3725	1667
Peak-hour factor, PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	188	34	71	80	10	641	42	1709	94	671	1417	163
RTOR Reduction (vph)	0	0	62	0	0	86	0	4	0	0	0	54
Lane Group Flow (vph)	94	128	9	0	90	555	42	1799	0	671	1417	109
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	9.0	9.0	15.9		12.4	45.2	6.9	53.0		32.8	78.9	87.9
Effective Green, g (s)	9.0	9.0	15.9		12.4	45.2	6.9	53.0		32.8	78.9	87.9
Actuated g/C Ratio	0.07	0.07	0.12		0.09	0.34	0.05	0.40		0.25	0.60	0.67
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	115	234	200		176	1146	97	2132		898	2226	1110
v/s Ratio Prot	c0.06	0.04	0.00		0.05	c0.12	0.02	c0.34		c0.19	0.38	0.01
v/s Ratio Perm			0.00			0.07						0.06
v/c Ratio	0.82	0.55	0.04		0.51	0.48	0.43	0.84		0.75	0.64	0.10
Uniform Delay, d1	60.7	59.5	51.3		56.9	34.2	60.7	35.8		45.8	17.2	7.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.90	1.09		0.98	0.89	1.25
Incremental Delay, d2	34.4	2.6	0.1		3.3	0.4	0.3	0.4		1.9	0.7	0.0
Delay (s)	95.1	62.2	51.4		60.2	34.6	54.9	39.4		46.5	16.1	9.9
Level of Service	F	E	D		E	C	D	D		D	B	A
Approach Delay (s)		70.1			37.7			39.7			24.7	
Approach LOS		E			D			D			C	

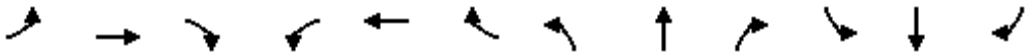
Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



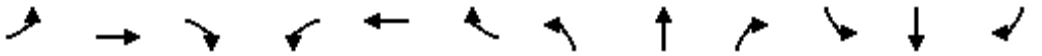
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	62	57	5	50	67	1024	102	76	907	59
Future Volume (vph)	84	3	62	57	5	50	67	1024	102	76	907	59
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1680		1863	1961	1643	1863	3675		1863	3691	
Flt Permitted	0.75	1.00		0.70	1.00	1.00	0.25	1.00		0.19	1.00	
Satd. Flow (perm)	1474	1680		1372	1961	1643	491	3675		377	3691	
Peak-hour factor, PHF	0.74	0.74	0.74	0.72	0.72	0.72	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	114	4	84	79	7	69	72	1101	110	80	955	62
RTOR Reduction (vph)	0	74	0	0	0	61	0	4	0	0	2	0
Lane Group Flow (vph)	114	14	0	79	7	8	72	1207	0	80	1015	0
Confl. Peds. (#/hr)	1					1						
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	15.5	15.5		15.5	15.5	15.5	96.2	91.6		100.8	93.9	
Effective Green, g (s)	15.5	15.5		15.5	15.5	15.5	96.2	91.6		100.8	93.9	
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12	0.73	0.69		0.76	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	173	197		161	230	192	405	2550		365	2625	
v/s Ratio Prot		0.01			0.00		0.01	c0.33		c0.01	0.27	
v/s Ratio Perm	c0.08			0.06		0.00	0.12			0.16		
v/c Ratio	0.66	0.07		0.49	0.03	0.04	0.18	0.47		0.22	0.39	
Uniform Delay, d1	55.7	51.8		54.6	51.6	51.7	9.2	9.2		10.3	7.6	
Progression Factor	1.01	0.98		1.00	1.00	1.00	1.00	1.00		0.09	0.16	
Incremental Delay, d2	8.7	0.2		2.3	0.1	0.1	0.2	0.6		0.1	0.1	
Delay (s)	64.8	51.2		56.9	51.6	51.8	9.4	9.8		1.0	1.4	
Level of Service	E	D		E	D	D	A	A		A	A	
Approach Delay (s)		58.9			54.4			9.8			1.3	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	65	0	0	1	62	1120	1	7	974	55
Future Volume (vph)	44	0	65	0	0	1	62	1120	1	7	974	55
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1696		1863	3725		1862	3696	
Flt Permitted	0.76	1.00			1.00		0.25	1.00		0.22	1.00	
Satd. Flow (perm)	1483	1667			1696		498	3725		432	3696	
Peak-hour factor, PHF	0.90	0.90	0.90	0.60	0.60	0.60	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	49	0	72	0	0	2	67	1204	1	7	1025	58
RTOR Reduction (vph)	0	67	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	49	5	0	0	0	0	67	1205	0	7	1080	0
Confl. Peds. (#/hr)									1	1		
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Effective Green, g (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.82		0.82	0.82	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	107	120			122		407	3051		353	3028	
v/s Ratio Prot		0.00			0.00			c0.32			0.29	
v/s Ratio Perm	c0.03						0.13			0.02		
v/c Ratio	0.46	0.04			0.00		0.16	0.39		0.02	0.36	
Uniform Delay, d1	48.5	47.0			46.9		2.1	2.6		1.8	2.5	
Progression Factor	1.00	1.00			1.00		0.40	0.34		1.00	1.00	
Incremental Delay, d2	3.1	0.1			0.0		0.8	0.3		0.1	0.3	
Delay (s)	51.6	47.2			46.9		1.6	1.2		1.9	2.8	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.0			46.9			1.2			2.8	
Approach LOS		D			D			A			A	

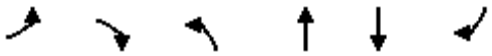
Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	718	179	1035	0	1602	0	0	1928	491
Future Volume (vph)	0	0	0	718	179	1035	0	1602	0	0	1928	491
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	816	203	1176	0	1686	0	0	2119	540
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	0	0	0	138
Lane Group Flow (vph)	0	0	0	816	203	1160	0	1686	0	0	2119	402
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				34.0	34.0	56.0		63.7			85.7	85.7
Effective Green, g (s)				34.0	34.0	56.0		63.7			85.7	85.7
Actuated g/C Ratio				0.26	0.26	0.42		0.48			0.65	0.65
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				930	505	1244		2583			3475	1082
v/s Ratio Prot				0.23	0.10	c0.40		c0.31			0.40	0.24
v/s Ratio Perm												
v/c Ratio				0.88	0.40	0.93		0.65			0.61	0.37
Uniform Delay, d1				47.0	40.6	36.2		25.8			13.4	10.7
Progression Factor				1.00	1.00	1.00		0.90			0.94	1.31
Incremental Delay, d2				9.4	0.5	12.6		0.9			0.4	0.5
Delay (s)				56.4	41.1	48.8		24.2			13.0	14.5
Level of Service				E	D	D		C			B	B
Approach Delay (s)		0.0			50.9			24.2			13.3	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	480	425	0	1650	2027	0
Future Volume (vph)	480	425	0	1650	2027	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.97	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1517		3725	3725	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1517		3725	3725	
Peak-hour factor, PHF	0.95	0.95	0.94	0.94	0.94	0.94
Adj. Flow (vph)	505	447	0	1755	2156	0
RTOR Reduction (vph)	7	7	0	0	0	0
Lane Group Flow (vph)	646	292	0	1755	2156	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	32.3	32.3		87.7	87.7	
Effective Green, g (s)	32.3	32.3		87.7	87.7	
Actuated g/C Ratio	0.24	0.24		0.66	0.66	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	865	371		2474	2474	
v/s Ratio Prot	0.18	c0.19		0.47	c0.58	
v/s Ratio Perm						
v/c Ratio	0.75	0.79		0.71	0.87	
Uniform Delay, d1	46.1	46.6		14.1	17.7	
Progression Factor	1.00	1.00		0.48	0.99	
Incremental Delay, d2	3.7	10.9		1.2	3.4	
Delay (s)	49.7	57.5		8.0	20.8	
Level of Service	D	E		A	C	
Approach Delay (s)	52.2			8.0	20.8	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	948	12	15	932	17	7
Future Volume (Veh/h)	948	12	15	932	17	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.87	0.87	0.82	0.82
Hourly flow rate (vph)	1042	13	17	1071	21	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.90		0.89	0.90
vC, conflicting volume			1055		1618	528
vC1, stage 1 conf vol					1048	
vC2, stage 2 conf vol					570	
vCu, unblocked vol			846		967	262
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		94	99
cM capacity (veh/h)			710		333	665

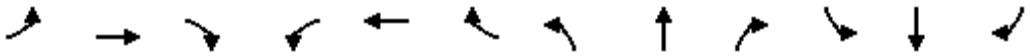
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	695	360	17	536	536	30
Volume Left	0	0	17	0	0	21
Volume Right	0	13	0	0	0	9
cSH	1700	1700	710	1700	1700	392
Volume to Capacity	0.41	0.21	0.02	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	2	0	0	6
Control Delay (s)	0.0	0.0	10.2	0.0	0.0	15.0
Lane LOS			B			B
Approach Delay (s)	0.0		0.2			15.0
Approach LOS						B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	879	3	1	1137	2	3
Future Volume (Veh/h)	879	3	1	1137	2	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.63	0.63
Hourly flow rate (vph)	925	3	1	1197	3	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.88		0.61	0.88
vC, conflicting volume			928		2126	464
vC1, stage 1 conf vol					926	
vC2, stage 2 conf vol					1199	
vCu, unblocked vol			639		1771	110
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			826		168	809

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	617	311	1	1197	8
Volume Left	0	0	1	0	3
Volume Right	0	3	0	0	5
cSH	1700	1700	826	1700	333
Volume to Capacity	0.36	0.18	0.00	0.70	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	9.4	0.0	16.1
Lane LOS			A		C
Approach Delay (s)	0.0		0.0		16.1
Approach LOS					C

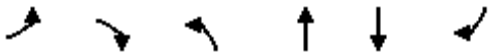
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	96	189	31	88	37	161	82	25	39	93	24
Future Volume (vph)	9	96	189	31	88	37	161	82	25	39	93	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.67	0.67	0.67
Hourly flow rate (vph)	9	101	199	33	93	39	187	95	29	58	139	36

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	9	300	33	132	187	124	58	175
Volume Left (vph)	9	0	33	0	187	0	58	0
Volume Right (vph)	0	199	0	39	0	29	0	36
Hadj (s)	0.53	-0.43	0.53	-0.17	0.53	-0.13	0.53	-0.11
Departure Headway (s)	6.8	5.9	7.0	6.3	6.8	6.1	6.9	6.2
Degree Utilization, x	0.02	0.49	0.06	0.23	0.35	0.21	0.11	0.30
Capacity (veh/h)	495	585	475	529	508	557	489	543
Control Delay (s)	8.7	13.1	9.3	10.0	12.2	9.5	9.5	10.7
Approach Delay (s)	13.0		9.9		11.1		10.4	
Approach LOS	B		A		B		B	

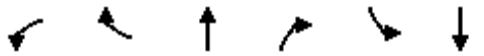
Intersection Summary				
Delay	11.3			
Level of Service	B			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	144	38	24	27	23	83
Future Volume (vph)	144	38	24	27	23	83
Peak Hour Factor	0.77	0.77	0.82	0.82	0.77	0.77
Hourly flow rate (vph)	187	49	29	33	30	108

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	187	49	29	33	138
Volume Left (vph)	187	0	29	0	0
Volume Right (vph)	0	49	0	0	108
Hadj (s)	0.53	-0.67	0.53	0.03	-0.44
Departure Headway (s)	5.5	4.3	5.8	5.3	4.6
Degree Utilization, x	0.29	0.06	0.05	0.05	0.18
Capacity (veh/h)	626	797	589	641	744
Control Delay (s)	9.5	6.4	7.9	7.4	8.6
Approach Delay (s)	8.9		7.6		8.6
Approach LOS	A		A		A

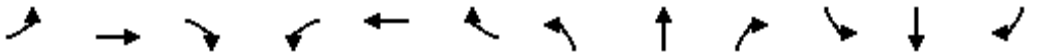
Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	1	1186	15	2	1012
Future Volume (Veh/h)	18	1	1186	15	2	1012
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	30	2	1303	16	2	1065
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.89					
vC, conflicting volume	1848	660			1320	
vC1, stage 1 conf vol	1312					
vC2, stage 2 conf vol	536					
vCu, unblocked vol	1712	660			1320	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	100			100	
cM capacity (veh/h)	205	405			519	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	30	2	869	450	2	532	532
Volume Left	30	0	0	0	2	0	0
Volume Right	0	2	0	16	0	0	0
cSH	205	405	1700	1700	519	1700	1700
Volume to Capacity	0.15	0.00	0.51	0.26	0.00	0.31	0.31
Queue Length 95th (ft)	13	0	0	0	0	0	0
Control Delay (s)	25.6	13.9	0.0	0.0	12.0	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	24.8		0.0		0.0		
Approach LOS	C						

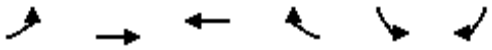
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	932	18	12	933	4	16	11	12	16	11	49
Future Volume (vph)	20	932	18	12	933	4	16	11	12	16	11	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.92		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3715		1863	3723		1863	1808		1863	1720	
Flt Permitted	0.25	1.00		0.22	1.00		0.59	1.00		0.74	1.00	
Satd. Flow (perm)	500	3715		438	3723		1159	1808		1453	1720	
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	24	1137	22	13	1037	4	17	12	13	27	18	82
RTOR Reduction (vph)	0	1	0	0	0	0	0	12	0	0	77	0
Lane Group Flow (vph)	24	1158	0	13	1041	0	17	13	0	27	23	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	107.7	103.2		103.1	100.9		8.6	8.6		8.6	8.6	
Effective Green, g (s)	107.7	103.2		103.1	100.9		8.6	8.6		8.6	8.6	
Actuated g/C Ratio	0.82	0.78		0.78	0.76		0.07	0.07		0.07	0.07	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	454	2904		365	2845		75	117		94	112	
v/s Ratio Prot	c0.00	c0.31		0.00	0.28			0.01			0.01	
v/s Ratio Perm	0.04			0.03			0.01			c0.02		
v/c Ratio	0.05	0.40		0.04	0.37		0.23	0.11		0.29	0.21	
Uniform Delay, d1	4.0	4.6		5.5	5.1		58.5	58.1		58.8	58.5	
Progression Factor	1.00	1.00		1.03	0.72		1.09	1.14		0.94	0.86	
Incremental Delay, d2	0.0	0.4		0.0	0.2		1.5	0.4		1.7	0.9	
Delay (s)	4.1	5.0		5.7	3.8		65.4	66.8		57.0	51.3	
Level of Service	A	A		A	A		E	E		E	D	
Approach Delay (s)		5.0			3.8			66.3			52.5	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	41	39	24	27	0
Future Volume (Veh/h)	0	41	39	24	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	45	42	26	29	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	68				100	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	68				100	55
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1533				899	1012

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	45	68	29
Volume Left	0	0	29
Volume Right	0	26	0
cSH	1533	1700	899
Volume to Capacity	0.00	0.04	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	43	25	41	38	25	40
Future Volume (Veh/h)	43	25	41	38	25	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	27	45	41	27	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			74		192	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			74		192	60
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	96
cM capacity (veh/h)			1526		774	1005

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	74	86	70
Volume Left	0	45	27
Volume Right	27	0	43
cSH	1700	1526	901
Volume to Capacity	0.04	0.03	0.08
Queue Length 95th (ft)	0	2	6
Control Delay (s)	0.0	4.0	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	4.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	9	14	117	9	14
Future Volume (Veh/h)	135	9	14	117	9	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	147	10	15	127	10	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					1.00	
vC, conflicting volume			157		309	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			157		308	152
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1423		676	894

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	157	142	25
Volume Left	0	15	10
Volume Right	10	0	15
cSH	1700	1423	792
Volume to Capacity	0.09	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.9	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	12	1741	16	13	1467
Future Volume (Veh/h)	15	12	1741	16	13	1467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	13	1833	17	14	1544
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.85	0.79			0.79	
vC, conflicting volume	2642	620			1850	
vC1, stage 1 conf vol	1842					
vC2, stage 2 conf vol	800					
vCu, unblocked vol	1074	0			1130	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			97	
cM capacity (veh/h)	210	853			483	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	733	733	384	14	772	772
Volume Left	16	0	0	0	14	0	0
Volume Right	13	0	0	17	0	0	0
cSH	317	1700	1700	1700	483	1700	1700
Volume to Capacity	0.09	0.43	0.43	0.23	0.03	0.45	0.45
Queue Length 95th (ft)	7	0	0	0	2	0	0
Control Delay (s)	17.5	0.0	0.0	0.0	12.7	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	17.5	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	875	77	20	1026	77	20
Future Volume (Veh/h)	875	77	20	1026	77	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	962	85	22	1127	84	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.52	
vC, conflicting volume			1047		2133	962
vC1, stage 1 conf vol					962	
vC2, stage 2 conf vol					1171	
vCu, unblocked vol			1047		2712	962
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		51	93
cM capacity (veh/h)			665		171	310

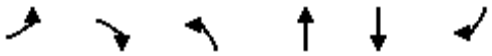
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	962	85	22	1127	106
Volume Left	0	0	22	0	84
Volume Right	0	85	0	0	22
cSH	1700	1700	665	1700	216
Volume to Capacity	0.57	0.05	0.03	0.66	0.49
Queue Length 95th (ft)	0	0	3	0	61
Control Delay (s)	0.0	0.0	10.6	0.0	39.0
Lane LOS			B		E
Approach Delay (s)	0.0		0.2		39.0
Approach LOS					E

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	828	67	0	1046	0	5
Future Volume (Veh/h)	828	67	0	1046	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	910	74	0	1149	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.54	
vC, conflicting volume			984		2096	492
vC1, stage 1 conf vol					947	
vC2, stage 2 conf vol					1149	
vCu, unblocked vol			984		2609	492
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			698		165	522

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	607	377	1149	5
Volume Left	0	0	0	0
Volume Right	0	74	0	5
cSH	1700	1700	1700	522
Volume to Capacity	0.36	0.22	0.68	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	12.0
Lane LOS				B
Approach Delay (s)	0.0		0.0	12.0
Approach LOS				B

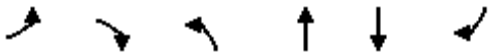
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	34	34	439	467	17
Future Volume (Veh/h)	79	34	34	439	467	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.88	0.88
Hourly flow rate (vph)	86	37	36	467	531	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1080	540	550			
vC1, stage 1 conf vol	540					
vC2, stage 2 conf vol	539					
vCu, unblocked vol	1014	391	402			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	93	96			
cM capacity (veh/h)	447	569	1001			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	86	37	36	467	550
Volume Left	86	0	36	0	0
Volume Right	0	37	0	0	19
cSH	447	569	1001	1700	1700
Volume to Capacity	0.19	0.07	0.04	0.27	0.32
Queue Length 95th (ft)	18	5	3	0	0
Control Delay (s)	15.0	11.8	8.7	0.0	0.0
Lane LOS	B	B	A		
Approach Delay (s)	14.0		0.6		0.0
Approach LOS	B				

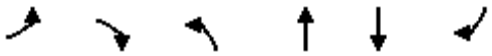
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	12	12	1145	1001	38
Future Volume (Veh/h)	38	12	12	1145	1001	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	41	13	13	1231	1054	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1716	547	1094			
vC1, stage 1 conf vol	1074					
vC2, stage 2 conf vol	642					
vCu, unblocked vol	1610	346	938			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	98	98			
cM capacity (veh/h)	273	601	671			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	41	13	13	616	616	703	391
Volume Left	41	0	13	0	0	0	0
Volume Right	0	13	0	0	0	0	40
cSH	273	601	671	1700	1700	1700	1700
Volume to Capacity	0.15	0.02	0.02	0.36	0.36	0.41	0.23
Queue Length 95th (ft)	13	2	1	0	0	0	0
Control Delay (s)	20.5	11.1	10.5	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	18.3		0.1			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	5	30	44	3
Future Volume (Veh/h)	11	32	5	30	44	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	18	53	8	50	73	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	116	39	78			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	39	78			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	95	99			
cM capacity (veh/h)	863	1024	1518			

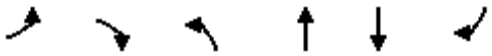
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	53	8	25	25	49	29
Volume Left	18	0	8	0	0	0	0
Volume Right	0	53	0	0	0	0	5
cSH	863	1024	1518	1700	1700	1700	1700
Volume to Capacity	0.02	0.05	0.01	0.01	0.01	0.03	0.02
Queue Length 95th (ft)	2	4	0	0	0	0	0
Control Delay (s)	9.3	8.7	7.4	0.0	0.0	0.0	0.0
Lane LOS	A	A	A				
Approach Delay (s)	8.8		1.0			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1602	528	0	2646
Future Volume (Veh/h)	0	0	1602	528	0	2646
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	0	0	1686	556	0	2908
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.83	0.72			0.72	
vC, conflicting volume	2655	843			2242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	885	0			1942	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	237	777			214	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	843	843	556	969	969	969
Volume Left	0	0	0	0	0	0
Volume Right	0	0	556	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.50	0.50	0.33	0.57	0.57	0.57
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

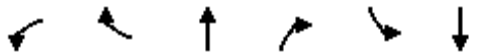
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	2130	2027	619
Future Volume (Veh/h)	0	0	0	2130	2027	619
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	2266	2156	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.81	0.74	0.74			
vC, conflicting volume	3289	1078	2815			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1918	404	2750			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	48	441	106			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1133	1133	1078	1078	659
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	659
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.67	0.67	0.63	0.63	0.39
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

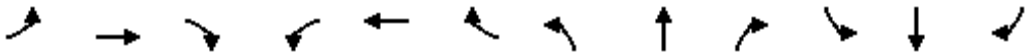


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1650	876	0	2452
Future Volume (Veh/h)	0	0	1650	876	0	2452
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	1755	932	0	2609
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.70	0.69			0.69	
vC, conflicting volume	2625	878			2687	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			2548	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	716	751			119	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	878	878	932	870	870	870
Volume Left	0	0	0	0	0	0
Volume Right	0	0	932	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.52	0.55	0.51	0.51	0.51
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

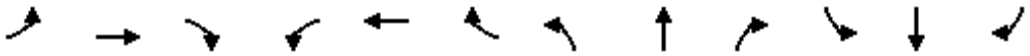
APPENDIX B-4. Future (2028) Conditions Capacity Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	374	547	178	87	231	153	126	605	181	156	455	161
Future Volume (vph)	374	547	178	87	231	153	126	605	181	156	455	161
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3576		1776	3339		1844	3562		1863	3565	
Flt Permitted	0.32	1.00		0.25	1.00		0.29	1.00		0.20	1.00	
Satd. Flow (perm)	635	3576		464	3339		561	3562		393	3565	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	425	622	202	97	257	170	137	658	197	173	506	179
RTOR Reduction (vph)	0	28	0	0	121	0	0	21	0	0	26	0
Lane Group Flow (vph)	425	796	0	97	306	0	137	834	0	173	659	0
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	47.3	32.1		24.7	16.1		52.3	45.7		52.3	45.7	
Effective Green, g (s)	47.3	32.1		24.7	16.1		52.3	45.7		52.3	45.7	
Actuated g/C Ratio	0.40	0.27		0.21	0.14		0.44	0.38		0.44	0.38	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	506	964		191	451		317	1367		254	1369	
v/s Ratio Prot	c0.17	0.22		0.04	0.09		0.02	0.23		c0.04	0.18	
v/s Ratio Perm	c0.16			0.07			0.17			c0.26		
v/c Ratio	0.84	0.83		0.51	0.68		0.43	0.61		0.68	0.48	
Uniform Delay, d1	36.2	40.8		49.6	49.0		31.7	29.5		40.2	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.93	0.93	
Incremental Delay, d2	11.7	5.8		2.1	4.0		0.9	2.0		7.1	1.2	
Delay (s)	47.9	46.7		51.8	53.0		32.7	31.5		44.6	26.9	
Level of Service	D	D		D	D		C	C		D	C	
Approach Delay (s)		47.1			52.8			31.7			30.5	
Approach LOS		D			D			C			C	

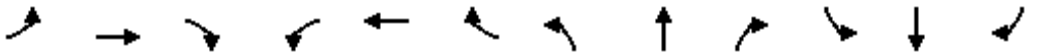
Intersection Summary			
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



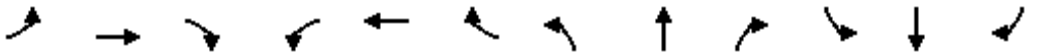
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1042	147	151	344	274	117	983	168	235	562	199
Future Volume (vph)	420	1042	147	151	344	274	117	983	168	235	562	199
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1845	3621		1792	3585	1604	1845	3608		1845	3545	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1845	3621		1792	3585	1604	1845	3608		1845	3545	
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	483	1198	169	178	405	322	127	1068	183	258	618	219
RTOR Reduction (vph)	0	9	0	0	0	0	0	10	0	0	26	0
Lane Group Flow (vph)	483	1358	0	178	405	322	127	1241	0	258	811	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	37.5	46.0		10.0	18.5	35.4	12.8	36.9		16.9	41.0	
Effective Green, g (s)	37.5	46.0		10.0	18.5	35.4	12.8	36.9		16.9	41.0	
Actuated g/C Ratio	0.28	0.34		0.07	0.14	0.26	0.10	0.28		0.13	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	516	1243		133	494	423	176	993		232	1084	
v/s Ratio Prot	0.26	c0.38		c0.10	0.11	0.10	0.07	c0.34		c0.14	c0.23	
v/s Ratio Perm						0.10						
v/c Ratio	0.94	1.09		1.34	0.82	0.76	0.72	1.25		1.11	0.75	
Uniform Delay, d1	47.1	44.0		62.0	56.1	45.4	58.9	48.5		58.5	41.8	
Progression Factor	0.94	0.90		1.02	1.03	0.84	0.93	0.87		0.85	0.80	
Incremental Delay, d2	21.3	52.8		191.4	13.1	7.4	12.5	120.0		90.3	2.7	
Delay (s)	65.4	92.3		254.4	70.8	45.7	67.4	162.2		140.0	36.2	
Level of Service	E	F		F	E	D	E	F		F	D	
Approach Delay (s)		85.3			98.0			153.5			60.7	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	100.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



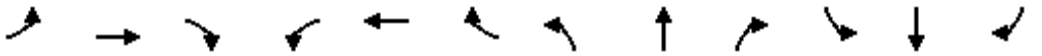
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	927	36	39	591	92	44	25	75	55	9	119
Future Volume (vph)	187	927	36	39	591	92	44	25	75	55	9	119
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	3633		1792	1887	1604	1841	1748	1650	1667	1754	1457
Flt Permitted	0.29	1.00		0.23	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	566	3633		428	1887	1604	1451	1748	1650	1296	1754	1457
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.70	0.70	0.70
Adj. Flow (vph)	205	1019	40	46	695	108	50	28	85	79	13	170
RTOR Reduction (vph)	0	2	0	0	0	38	0	0	80	0	0	157
Lane Group Flow (vph)	205	1057	0	46	695	70	50	28	5	79	13	13
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	14%	14%	14%
Parking (#/hr)								0				
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	96.5	89.0		91.7	86.6	86.6	12.8	7.7	7.7	18.2	10.4	10.4
Effective Green, g (s)	96.5	89.0		91.7	86.6	86.6	12.8	7.7	7.7	18.2	10.4	10.4
Actuated g/C Ratio	0.72	0.66		0.68	0.65	0.65	0.10	0.06	0.06	0.14	0.08	0.08
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	478	2412		344	1219	1036	153	100	94	197	136	113
v/s Ratio Prot	c0.02	0.29		0.01	c0.37		0.01	0.02		c0.02	0.01	
v/s Ratio Perm	0.28			0.09		0.04	0.02		0.00	c0.03		0.01
v/c Ratio	0.43	0.44		0.13	0.57	0.07	0.33	0.28	0.05	0.40	0.10	0.12
Uniform Delay, d1	19.0	10.7		13.0	13.3	8.8	56.8	60.5	59.7	53.3	57.4	57.5
Progression Factor	0.32	0.51		0.49	0.70	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		0.2	1.9	0.1	1.3	1.5	0.2	1.3	0.3	0.5
Delay (s)	6.2	5.5		6.6	11.2	1.0	58.0	62.0	59.9	54.6	57.7	58.0
Level of Service	A	A		A	B	A	E	E	E	D	E	E
Approach Delay (s)		5.6			9.6			59.7			57.0	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	82	33	2	3	81	504	94	1	755	15
Future Volume (vph)	5	2	82	33	2	3	81	504	94	1	755	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	7	3	112	48	3	4	103	638	119	1	910	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	34	0	0	6
Lane Group Flow (vph)	7	3	112	48	7	0	103	638	85	1	910	12
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	6.0	21.0	6.6	6.6		9.0	95.3	95.3	1.3	87.6	87.6
Effective Green, g (s)	6.0	6.0	21.0	6.6	6.6		9.0	95.3	95.3	1.3	87.6	87.6
Actuated g/C Ratio	0.04	0.04	0.16	0.05	0.05		0.07	0.71	0.71	0.01	0.65	0.65
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	85	446	163	81		240	3770	1173	18	3499	1089
v/s Ratio Prot	0.00	0.00	c0.04	c0.01	0.00		c0.03	0.12		0.00	c0.17	
v/s Ratio Perm									0.05			0.01
v/c Ratio	0.09	0.04	0.25	0.29	0.09		0.43	0.17	0.07	0.06	0.26	0.01
Uniform Delay, d1	61.4	61.2	49.6	61.5	60.8		60.0	6.4	5.9	65.7	9.7	8.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.14	0.60	0.51	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	1.2	0.5		1.2	0.1	0.1	1.3	0.2	0.0
Delay (s)	61.8	61.4	49.9	62.6	61.4		69.8	3.9	3.1	67.0	9.9	8.1
Level of Service	E	E	D	E	E		E	A	A	E	A	A
Approach Delay (s)		50.9			62.5			11.7			9.9	
Approach LOS		D			E			B			A	

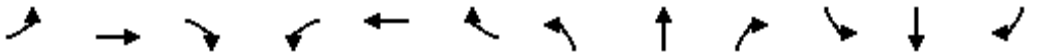
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	629	98	29	375	203	176	273	90	125	131	104
Future Volume (vph)	160	629	98	29	375	203	176	273	90	125	131	104
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1845	1942	1650	1827	1923	1635	1861	1961	1667	1845	1942	1620
Flt Permitted	0.41	1.00	1.00	0.20	1.00	1.00	0.54	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	788	1942	1650	378	1923	1635	1049	1961	1667	485	1942	1620
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	172	676	105	33	421	228	185	287	95	147	154	122
RTOR Reduction (vph)	0	0	43	0	0	95	0	0	73	0	0	95
Lane Group Flow (vph)	172	676	62	33	421	133	185	287	22	147	154	27
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	71.7	66.2	78.8	71.7	66.2	78.3	37.8	25.2	30.7	36.8	24.7	30.2
Effective Green, g (s)	71.7	66.2	78.8	71.7	66.2	78.3	37.8	25.2	30.7	36.8	24.7	30.2
Actuated g/C Ratio	0.54	0.49	0.59	0.54	0.49	0.58	0.28	0.19	0.23	0.27	0.18	0.23
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	465	959	970	261	950	955	372	368	381	256	357	365
v/s Ratio Prot	c0.02	c0.35	0.01	0.01	0.22	0.01	0.05	c0.15	0.00	c0.05	0.08	0.00
v/s Ratio Perm	0.18		0.03	0.06		0.07	0.09		0.01	0.11		0.01
v/c Ratio	0.37	0.70	0.06	0.13	0.44	0.14	0.50	0.78	0.06	0.57	0.43	0.08
Uniform Delay, d1	18.0	26.3	11.8	19.3	22.0	12.6	38.4	51.8	40.3	39.2	48.4	40.9
Progression Factor	0.38	0.50	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	4.1	0.0	0.2	1.5	0.1	1.0	10.3	0.1	3.1	1.0	0.1
Delay (s)	7.2	17.1	10.1	19.5	23.5	12.7	39.5	62.1	40.4	42.3	49.4	41.0
Level of Service	A	B	B	B	C	B	D	E	D	D	D	D
Approach Delay (s)		14.6			19.7			51.1			44.5	
Approach LOS		B			B			D			D	

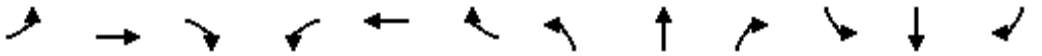
Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



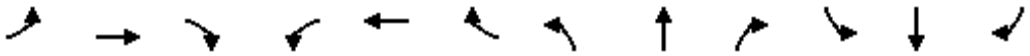
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	31	8	1	93	32	1370	32	240	1047	73
Future Volume (vph)	58	0	31	8	1	93	32	1370	32	240	1047	73
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3390	1667		1875	2933	1845	5283		3579	3689	1650
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3390	1667		1875	2933	1845	5283		3579	3689	1650
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.86	0.86	0.86	0.88	0.88	0.88
Adj. Flow (vph)	97	0	52	11	1	127	37	1593	37	273	1190	83
RTOR Reduction (vph)	0	0	48	0	0	107	0	2	0	0	0	20
Lane Group Flow (vph)	48	49	4	0	12	20	37	1628	0	273	1190	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	6.7	6.7	11.2		2.8	20.7	4.5	81.8		17.9	95.2	101.9
Effective Green, g (s)	6.7	6.7	11.2		2.8	20.7	4.5	81.8		17.9	95.2	101.9
Actuated g/C Ratio	0.05	0.05	0.08		0.02	0.15	0.03	0.61		0.13	0.71	0.76
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	84	169	139		39	593	61	3224		478	2620	1254
v/s Ratio Prot	c0.03	0.01	0.00		c0.01	0.00	0.02	c0.31		c0.08	0.32	0.00
v/s Ratio Perm			0.00			0.00						0.04
v/c Ratio	0.57	0.29	0.03		0.31	0.03	0.61	0.51		0.57	0.45	0.05
Uniform Delay, d1	62.2	61.4	56.4		64.6	48.1	63.9	14.7		54.4	8.3	4.0
Progression Factor	1.01	1.00	1.00		1.00	1.00	0.85	0.97		0.73	0.43	0.13
Incremental Delay, d2	9.1	1.0	0.1		6.0	0.0	1.5	0.1		1.7	0.5	0.0
Delay (s)	71.7	62.6	56.5		70.7	48.2	56.0	14.3		41.4	4.1	0.5
Level of Service	E	E	E		E	D	E	B		D	A	A
Approach Delay (s)		63.4			50.1			15.3			10.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



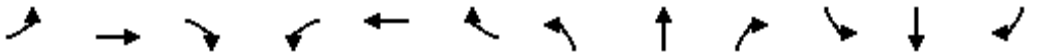
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	14	119	64	2	72	46	1150	66	67	708	19
Future Volume (vph)	50	14	119	64	2	72	46	1150	66	67	708	19
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	1664		1863	1961	1667	1845	3659		1810	3605	
Flt Permitted	0.76	1.00		0.35	1.00	1.00	0.32	1.00		0.17	1.00	
Satd. Flow (perm)	1454	1664		687	1961	1667	630	3659		325	3605	
Peak-hour factor, PHF	0.72	0.72	0.72	0.74	0.74	0.74	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	69	19	165	86	3	97	49	1237	71	74	787	21
RTOR Reduction (vph)	0	145	0	0	0	85	0	2	0	0	1	0
Lane Group Flow (vph)	69	39	0	86	3	12	49	1306	0	74	807	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3	16.3	99.7	95.1		99.7	95.1	
Effective Green, g (s)	16.3	16.3		16.3	16.3	16.3	99.7	95.1		99.7	95.1	
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12	0.74	0.71		0.74	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	202		83	238	202	510	2596		292	2558	
v/s Ratio Prot		0.02			0.00		0.00	c0.36		c0.01	0.22	
v/s Ratio Perm	0.05			c0.13		0.01	0.07			0.18		
v/c Ratio	0.39	0.19		1.04	0.01	0.06	0.10	0.50		0.25	0.32	
Uniform Delay, d1	54.3	52.9		58.9	51.8	52.1	6.5	8.8		12.6	7.3	
Progression Factor	1.02	1.07		1.00	1.00	1.00	1.00	1.00		1.24	0.84	
Incremental Delay, d2	1.4	0.5		109.0	0.0	0.1	0.1	0.7		0.2	0.1	
Delay (s)	56.9	57.2		167.9	51.8	52.2	6.6	9.5		15.7	6.2	
Level of Service	E	E		F	D	D	A	A		B	A	
Approach Delay (s)		57.1			105.7			9.4			7.0	
Approach LOS		E			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



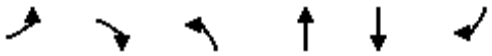
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	39	1	0	5	37	1099	1	17	804	33
Future Volume (vph)	27	0	39	1	0	5	37	1099	1	17	804	33
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1498		1845	3689		1845	3667	
Flt Permitted	0.75	1.00			0.95		0.29	1.00		0.22	1.00	
Satd. Flow (perm)	1475	1667			1433		554	3689		418	3667	
Peak-hour factor, PHF	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	38	0	54	1	0	7	42	1235	1	20	946	39
RTOR Reduction (vph)	0	51	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	38	3	0	0	0	0	42	1236	0	20	983	0
Heavy Vehicles (%)	2%	2%	2%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.3	7.3			7.3		99.9	99.9		99.9	99.9	
Effective Green, g (s)	7.3	7.3			7.3		99.9	99.9		99.9	99.9	
Actuated g/C Ratio	0.06	0.06			0.06		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	102			87		465	3096		350	3078	
v/s Ratio Prot		0.00						c0.34			0.27	
v/s Ratio Perm	c0.03				0.00		0.08			0.05		
v/c Ratio	0.42	0.03			0.01		0.09	0.40		0.06	0.32	
Uniform Delay, d1	53.8	52.5			52.4		1.7	2.3		1.6	2.1	
Progression Factor	1.00	1.00			1.00		0.10	0.09		1.00	1.00	
Incremental Delay, d2	3.2	0.1			0.0		0.3	0.3		0.3	0.3	
Delay (s)	57.0	52.7			52.5		0.5	0.5		1.9	2.4	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		54.4			52.5			0.5			2.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	670	61	366	0	478	0	0	797	110
Future Volume (vph)	0	0	0	670	61	366	0	478	0	0	797	110
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3544	1923	2877		5353			5301	1650
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3544	1923	2877		5353			5301	1650
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	848	77	463	0	590	0	0	839	116
RTOR Reduction (vph)	0	0	0	0	0	225	0	0	0	0	0	44
Lane Group Flow (vph)	0	0	0	848	77	238	0	590	0	0	839	72
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				38.4	38.4	54.4		67.3			83.3	83.3
Effective Green, g (s)				38.4	38.4	54.4		67.3			83.3	83.3
Actuated g/C Ratio				0.29	0.29	0.41		0.50			0.62	0.62
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1015	551	1167		2688			3295	1025
v/s Ratio Prot				c0.24	0.04	0.08		0.11			c0.16	0.04
v/s Ratio Perm												
v/c Ratio				0.84	0.14	0.20		0.22			0.25	0.07
Uniform Delay, d1				44.8	35.5	25.8		18.7			11.4	10.0
Progression Factor				1.00	1.00	1.00		0.74			0.62	0.35
Incremental Delay, d2				6.1	0.1	0.1		0.2			0.2	0.1
Delay (s)				50.9	35.6	25.9		13.9			7.3	3.6
Level of Service				D	D	C		B			A	A
Approach Delay (s)		0.0			41.7			13.9			6.8	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	66	200	0	594	1133	0
Future Volume (vph)	66	200	0	594	1133	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.91	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3360	1502		3725	3689	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3360	1502		3725	3689	
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.86	0.86
Adj. Flow (vph)	73	220	0	667	1317	0
RTOR Reduction (vph)	93	93	0	0	0	0
Lane Group Flow (vph)	90	17	0	667	1317	0
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	9.5	9.5		112.5	112.5	
Effective Green, g (s)	9.5	9.5		112.5	112.5	
Actuated g/C Ratio	0.07	0.07		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	238	106		3127	3097	
v/s Ratio Prot	c0.03	0.01		0.18	c0.36	
v/s Ratio Perm						
v/c Ratio	0.38	0.16		0.21	0.43	
Uniform Delay, d1	59.4	58.5		2.1	2.7	
Progression Factor	1.00	1.00		3.00	0.38	
Incremental Delay, d2	1.2	0.8		0.1	0.4	
Delay (s)	60.6	59.4		6.4	1.4	
Level of Service	E	E		A	A	
Approach Delay (s)	60.1			6.4	1.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1604	39	4	656	4	5
Future Volume (Veh/h)	1604	39	4	656	4	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.60	0.60
Hourly flow rate (vph)	1844	45	5	772	7	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.76		0.81	0.76
vC, conflicting volume			1889		2262	944
vC1, stage 1 conf vol					1866	
vC2, stage 2 conf vol					396	
vCu, unblocked vol			1533		1501	286
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		94	99
cM capacity (veh/h)			326		126	539

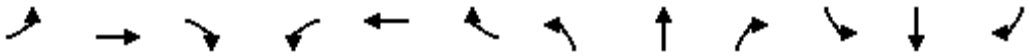
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1229	660	5	386	386	15
Volume Left	0	0	5	0	0	7
Volume Right	0	45	0	0	0	8
cSH	1700	1700	326	1700	1700	213
Volume to Capacity	0.72	0.39	0.02	0.23	0.23	0.07
Queue Length 95th (ft)	0	0	1	0	0	6
Control Delay (s)	0.0	0.0	16.2	0.0	0.0	23.2
Lane LOS			C			C
Approach Delay (s)	0.0		0.1			23.2
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1096	10	3	662	12	12
Future Volume (Veh/h)	1096	10	3	662	12	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1245	11	3	720	16	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.70		0.80	0.70
vC, conflicting volume			1256		1976	628
vC1, stage 1 conf vol					1250	
vC2, stage 2 conf vol					726	
vCu, unblocked vol			504		978	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	98
cM capacity (veh/h)			729		337	758

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	830	426	3	720	32
Volume Left	0	0	3	0	16
Volume Right	0	11	0	0	16
cSH	1700	1700	729	1700	467
Volume to Capacity	0.49	0.25	0.00	0.42	0.07
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.0	0.0	10.0	0.0	13.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		13.3
Approach LOS					B

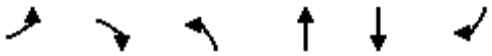
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	67	23	34	28	43	24	131	79	71	83	3
Future Volume (vph)	14	67	23	34	28	43	24	131	79	71	83	3
Peak Hour Factor	0.95	0.95	0.95	0.75	0.75	0.75	0.82	0.82	0.82	0.74	0.74	0.74
Hourly flow rate (vph)	15	71	24	45	37	57	29	160	96	96	112	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	15	95	45	94	29	256	96	116
Volume Left (vph)	15	0	45	0	29	0	96	0
Volume Right (vph)	0	24	0	57	0	96	0	4
Hadj (s)	0.53	-0.14	0.64	-0.29	0.57	-0.19	0.53	0.01
Departure Headway (s)	6.5	5.8	6.5	5.6	6.0	5.2	6.0	5.5
Degree Utilization, x	0.03	0.15	0.08	0.15	0.05	0.37	0.16	0.18
Capacity (veh/h)	514	575	514	595	573	660	569	623
Control Delay (s)	8.4	8.6	8.9	8.4	8.1	10.1	9.0	8.5
Approach Delay (s)	8.6		8.5		9.9		8.7	
Approach LOS	A		A		A		A	

Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	93	7	47	56	6	30
Future Volume (vph)	93	7	47	56	6	30
Peak Hour Factor	0.73	0.73	0.72	0.72	0.88	0.88
Hourly flow rate (vph)	127	10	65	78	7	34

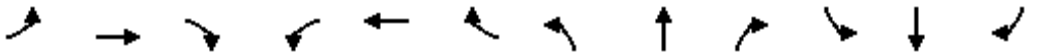
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	127	10	65	78	41
Volume Left (vph)	127	0	65	0	0
Volume Right (vph)	0	10	0	0	34
Hadj (s)	0.53	-0.67	0.53	0.03	-0.46
Departure Headway (s)	5.5	4.3	5.5	5.0	4.4
Degree Utilization, x	0.19	0.01	0.10	0.11	0.05
Capacity (veh/h)	627	801	639	702	777
Control Delay (s)	8.6	6.1	7.9	7.4	7.6
Approach Delay (s)	8.4		7.6		7.6
Approach LOS	A		A		A

Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	10	1069	27	22	818
Future Volume (Veh/h)	17	10	1069	27	22	818
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	28	17	1125	28	24	899
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.93					
vC, conflicting volume	1636	576			1153	
vC1, stage 1 conf vol	1139					
vC2, stage 2 conf vol	498					
vCu, unblocked vol	1532	576			1153	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	96			96	
cM capacity (veh/h)	249	460			602	

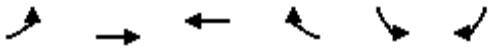
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	28	17	750	403	24	450	450
Volume Left	28	0	0	0	24	0	0
Volume Right	0	17	0	28	0	0	0
cSH	249	460	1700	1700	602	1700	1700
Volume to Capacity	0.11	0.04	0.44	0.24	0.04	0.26	0.26
Queue Length 95th (ft)	9	3	0	0	3	0	0
Control Delay (s)	21.3	13.1	0.0	0.0	11.2	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	18.2		0.0		0.3		
Approach LOS	C						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1601	19	3	612	45	16	5	10	32	2	38
Future Volume (vph)	47	1601	19	3	612	45	16	5	10	32	2	38
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	3647		1845	3651		1863	1759		1863	1680	
Flt Permitted	0.37	1.00		0.09	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	720	3647		167	3651		1400	1759		1465	1680	
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	54	1840	22	3	651	48	17	5	11	53	3	63
RTOR Reduction (vph)	0	0	0	0	3	0	0	10	0	0	59	0
Lane Group Flow (vph)	54	1862	0	3	696	0	17	6	0	53	7	0
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	113.0	105.8		100.0	98.8		9.0	9.0		9.0	9.0	
Effective Green, g (s)	113.0	105.8		100.0	98.8		9.0	9.0		9.0	9.0	
Actuated g/C Ratio	0.84	0.79		0.75	0.74		0.07	0.07		0.07	0.07	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	674	2879		139	2691		94	118		98	112	
v/s Ratio Prot	c0.00	c0.51		0.00	0.19			0.00			0.00	
v/s Ratio Perm	0.06			0.02			0.01			c0.04		
v/c Ratio	0.08	0.65		0.02	0.26		0.18	0.05		0.54	0.06	
Uniform Delay, d1	2.3	6.1		14.4	5.7		59.0	58.5		60.5	58.6	
Progression Factor	1.00	1.00		1.05	0.96		0.96	0.92		1.01	1.06	
Incremental Delay, d2	0.1	1.1		0.0	0.2		0.9	0.2		6.0	0.2	
Delay (s)	2.4	7.2		15.2	5.7		57.7	53.9		67.0	62.1	
Level of Service	A	A		B	A		E	D		E	E	
Approach Delay (s)		7.1			5.7			55.9			64.3	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	24	31	9	43	0
Future Volume (Veh/h)	0	24	31	9	43	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	34	10	47	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	44				65	39
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	44				65	39
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1564				941	1033

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	26	44	47
Volume Left	0	0	47
Volume Right	0	10	0
cSH	1564	1700	941
Volume to Capacity	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	61	6	10	21	19	28
Future Volume (Veh/h)	61	6	10	21	19	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	7	11	23	21	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			73		114	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			73		114	70
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1527		876	993

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	73	34	51
Volume Left	0	11	21
Volume Right	7	0	30
cSH	1700	1527	941
Volume to Capacity	0.04	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	2.4	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	174	2	4	63	6	9
Future Volume (Veh/h)	174	2	4	63	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	2	4	68	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked						
vC, conflicting volume			191		266	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		266	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1383		721	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	191	72	17
Volume Left	0	4	7
Volume Right	2	0	10
cSH	1700	1383	793
Volume to Capacity	0.11	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		18.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	3	1431	17	5	1081
Future Volume (Veh/h)	9	3	1431	17	5	1081
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.88	0.88
Hourly flow rate (vph)	10	3	1664	20	6	1228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.83	0.76			0.76	
vC, conflicting volume	2300	565			1684	
vC1, stage 1 conf vol	1674					
vC2, stage 2 conf vol	626					
vCu, unblocked vol	965	0			806	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	298	827			616	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	13	666	666	353	6	614	614
Volume Left	10	0	0	0	6	0	0
Volume Right	3	0	0	20	0	0	0
cSH	350	1700	1700	1700	616	1700	1700
Volume to Capacity	0.04	0.39	0.39	0.21	0.01	0.36	0.36
Queue Length 95th (ft)	3	0	0	0	1	0	0
Control Delay (s)	15.7	0.0	0.0	0.0	10.9	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	15.7	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	900	17	5	650	57	18
Future Volume (Veh/h)	900	17	5	650	57	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	968	18	6	730	62	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.77	
vC, conflicting volume			986		1710	968
vC1, stage 1 conf vol					968	
vC2, stage 2 conf vol					742	
vCu, unblocked vol			986		1773	968
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		78	94
cM capacity (veh/h)			693		286	308

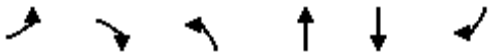
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	968	18	6	730	82
Volume Left	0	0	6	0	62
Volume Right	0	18	0	0	20
cSH	1700	1700	693	1700	379
Volume to Capacity	0.57	0.01	0.01	0.43	0.22
Queue Length 95th (ft)	0	0	1	0	20
Control Delay (s)	0.0	0.0	10.2	0.0	20.2
Lane LOS			B		C
Approach Delay (s)	0.0		0.1		20.2
Approach LOS					C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	885	33	0	655	0	2
Future Volume (Veh/h)	885	33	0	655	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	952	35	0	736	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.77	
vC, conflicting volume			987		1706	494
vC1, stage 1 conf vol					970	
vC2, stage 2 conf vol					736	
vCu, unblocked vol			987		1768	494
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			684		260	521

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	635	352	736	2
Volume Left	0	0	0	0
Volume Right	0	35	0	2
cSH	1700	1700	1700	521
Volume to Capacity	0.37	0.21	0.43	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	11.9
Lane LOS				B
Approach Delay (s)	0.0		0.0	11.9
Approach LOS				B

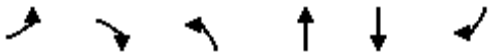
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	33	524	244	14
Future Volume (Veh/h)	15	13	33	524	244	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	16	14	35	552	287	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	917	295	303			
vC1, stage 1 conf vol	295					
vC2, stage 2 conf vol	622					
vCu, unblocked vol	873	204	212			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	97			
cM capacity (veh/h)	478	778	1262			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	16	14	35	552	303
Volume Left	16	0	35	0	0
Volume Right	0	14	0	0	16
cSH	478	778	1262	1700	1700
Volume to Capacity	0.03	0.02	0.03	0.32	0.18
Queue Length 95th (ft)	3	1	2	0	0
Control Delay (s)	12.8	9.7	7.9	0.0	0.0
Lane LOS	B	A	A		
Approach Delay (s)	11.4		0.5		0.0
Approach LOS	B				

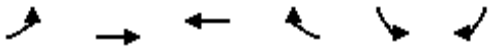
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	15	5	1107	836	8
Future Volume (Veh/h)	30	15	5	1107	836	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	33	16	6	1244	984	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1622	496	993			
vC1, stage 1 conf vol	988					
vC2, stage 2 conf vol	634					
vCu, unblocked vol	1536	339	867			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	293	618	721			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	33	16	6	622	622	656	337
Volume Left	33	0	6	0	0	0	0
Volume Right	0	16	0	0	0	0	9
cSH	293	618	721	1700	1700	1700	1700
Volume to Capacity	0.11	0.03	0.01	0.37	0.37	0.39	0.20
Queue Length 95th (ft)	9	2	1	0	0	0	0
Control Delay (s)	18.8	11.0	10.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	16.3		0.0			0.0	
Approach LOS	C						

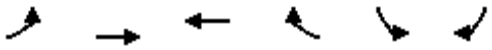
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	44	51	55	45	41
Future Volume (Veh/h)	47	44	51	55	45	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.60	0.60	0.73	0.73	0.92	0.92
Hourly flow rate (vph)	78	73	70	75	49	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	145				300	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	145				300	72
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				92	95
cM capacity (veh/h)	1435				631	975

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	78	36	36	47	98	49	45
Volume Left	78	0	0	0	0	49	0
Volume Right	0	0	0	0	75	0	45
cSH	1435	1700	1700	1700	1700	631	975
Volume to Capacity	0.05	0.02	0.02	0.03	0.06	0.08	0.05
Queue Length 95th (ft)	4	0	0	0	0	6	4
Control Delay (s)	7.7	0.0	0.0	0.0	0.0	11.2	8.9
Lane LOS	A					B	A
Approach Delay (s)	4.0			0.0		10.1	
Approach LOS						B	

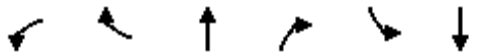
Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	985	664	50	23	58
Future Volume (Veh/h)	72	985	664	50	23	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	79	1082	781	59	25	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.87	
vC, conflicting volume	840				1510	420
vC1, stage 1 conf vol					810	
vC2, stage 2 conf vol					699	
vCu, unblocked vol	840				1278	420
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				92	89
cM capacity (veh/h)	778				332	582

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	79	541	541	521	319	25	63
Volume Left	79	0	0	0	0	25	0
Volume Right	0	0	0	0	59	0	63
cSH	778	1700	1700	1700	1700	332	582
Volume to Capacity	0.10	0.32	0.32	0.31	0.19	0.08	0.11
Queue Length 95th (ft)	8	0	0	0	0	6	9
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	16.7	11.9
Lane LOS	B					C	B
Approach Delay (s)	0.7			0.0		13.3	
Approach LOS						B	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	41	6	228	37	8	132
Future Volume (Veh/h)	41	6	228	37	8	132
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.82	0.82	0.74	0.74
Hourly flow rate (vph)	45	7	278	45	11	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	500	300			323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	466	259			282	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			99	
cM capacity (veh/h)	532	754			1237	

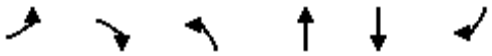
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	45	7	323	11	178
Volume Left	45	0	0	11	0
Volume Right	0	7	45	0	0
cSH	532	754	1700	1237	1700
Volume to Capacity	0.08	0.01	0.19	0.01	0.10
Queue Length 95th (ft)	7	1	0	1	0
Control Delay (s)	12.4	9.8	0.0	7.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	12.0		0.0	0.5	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	198	19	4	100	5	2
Future Volume (Veh/h)	198	19	4	100	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.75	0.75	0.92	0.92
Hourly flow rate (vph)	208	20	5	133	5	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			228		361	218
vC1, stage 1 conf vol					218	
vC2, stage 2 conf vol					143	
vCu, unblocked vol			228		361	218
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1306		756	822

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	228	5	133	5	2
Volume Left	0	5	0	5	0
Volume Right	20	0	0	0	2
cSH	1700	1306	1700	756	822
Volume to Capacity	0.13	0.00	0.08	0.01	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	7.8	0.0	9.8	9.4
Lane LOS		A		A	A
Approach Delay (s)	0.0	0.3		9.7	
Approach LOS				A	

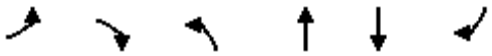
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1112	851	0
Future Volume (Veh/h)	0	0	0	1112	851	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	0	0	0	1249	1001	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.85	0.96	0.96			
vC, conflicting volume	1626	500	1001			
vC1, stage 1 conf vol	1001					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1186	398	919			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	315	577	703			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	0	0	624	624	667	334
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.37	0.37	0.39	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A					
Approach Delay (s)	0.0		0.0			0.0	
Approach LOS	A						

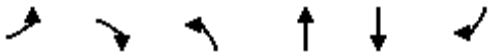
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1112	851	0
Future Volume (Veh/h)	0	0	0	1112	851	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	0	0	0	1249	1001	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.87	0.95	0.95			
vC, conflicting volume	1626	500	1001			
vC1, stage 1 conf vol	1001					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1166	375	900			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	319	593	708			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	624	624	500	500
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.37	0.37	0.29	0.29
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

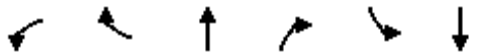
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	6	23	74	66	10
Future Volume (Veh/h)	3	6	23	74	66	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	5	10	38	123	110	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	256	64	127			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	64	127			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	692	988	1457			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	10	38	62	62	73	54
Volume Left	5	0	38	0	0	0	0
Volume Right	0	10	0	0	0	0	17
cSH	692	988	1457	1700	1700	1700	1700
Volume to Capacity	0.01	0.01	0.03	0.04	0.04	0.04	0.03
Queue Length 95th (ft)	1	1	2	0	0	0	0
Control Delay (s)	10.2	8.7	7.5	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.2		1.8			0.0	
Approach LOS	A						

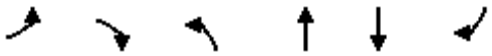
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	478	182	0	1467
Future Volume (Veh/h)	0	0	478	182	0	1467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.81	0.81	0.95	0.95
Hourly flow rate (vph)	0	0	590	225	0	1544
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.93					
vC, conflicting volume	1105	295			815	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	295			815	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	273	701			802	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	295	295	225	515	515	515
Volume Left	0	0	0	0	0	0
Volume Right	0	0	225	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.17	0.13	0.30	0.30	0.30
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	660	1133	334
Future Volume (Veh/h)	0	0	0	660	1133	334
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	0	742	1317	388
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.95	0.93	0.93			
vC, conflicting volume	1688	658	1705			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1453	485	1609			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	115	491	374			

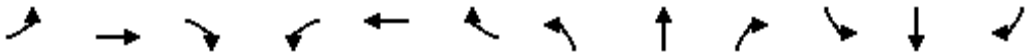
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	371	371	658	658	388
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	388
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.39	0.39	0.23
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	594	923	0	1333
Future Volume (Veh/h)	0	0	594	923	0	1333
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	667	1037	0	1550
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.92					
vC, conflicting volume	1184	334			1704	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	334			1704	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	256	662			365	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	334	334	1037	517	517	517
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1037	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.20	0.61	0.30	0.30	0.30
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

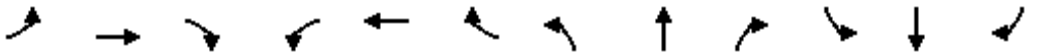
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	317	229	243	602	246	217	763	91	202	803	370
Future Volume (vph)	278	317	229	243	602	246	217	763	91	202	803	370
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.96		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3491		1863	3549		1863	3659		1863	3538	
Flt Permitted	0.18	1.00		0.20	1.00		0.10	1.00		0.11	1.00	
Satd. Flow (perm)	346	3491		393	3549		198	3659		219	3538	
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	312	356	257	261	647	265	238	838	100	213	845	389
RTOR Reduction (vph)	0	116	0	0	36	0	0	7	0	0	44	0
Lane Group Flow (vph)	312	497	0	261	876	0	238	931	0	213	1190	0
Confl. Peds. (#/hr)	1					1			3	3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	36.1	22.7		51.4	31.4		52.2	39.6		52.2	39.6	
Effective Green, g (s)	36.1	22.7		51.4	31.4		52.2	39.6		52.2	39.6	
Actuated g/C Ratio	0.29	0.18		0.42	0.26		0.42	0.32		0.42	0.32	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	266	644		428	906		254	1178		261	1139	
v/s Ratio Prot	c0.13	0.14		0.11	c0.25		c0.10	0.25		0.08	c0.34	
v/s Ratio Perm	c0.22			0.15			0.30			0.26		
v/c Ratio	1.17	0.77		0.61	0.97		0.94	0.79		0.82	1.04	
Uniform Delay, d1	51.4	47.7		37.8	45.3		51.3	37.9		45.7	41.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.94	0.94	
Incremental Delay, d2	110.2	5.7		2.5	22.0		39.3	5.4		16.6	38.3	
Delay (s)	161.6	53.4		40.3	67.3		90.6	43.4		59.6	77.4	
Level of Service	F	D		D	E		F	D		E	E	
Approach Delay (s)		89.9			61.3			52.9			74.8	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	69.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

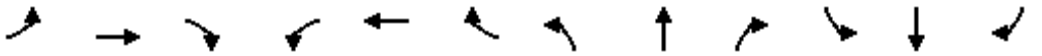
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	594	117	277	918	515	212	1035	215	300	815	240
Future Volume (vph)	228	594	117	277	918	515	212	1035	215	300	815	240
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3634		1863	3725	1667	1863	3629		1863	3598	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3634		1863	3725	1667	1863	3629		1863	3598	
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	259	675	133	301	998	560	230	1125	234	316	858	253
RTOR Reduction (vph)	0	12	0	0	0	0	0	13	0	0	20	0
Lane Group Flow (vph)	259	796	0	301	998	560	230	1346	0	316	1091	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	21.6	39.0		15.0	32.4	48.3	16.9	40.9		15.9	39.9	
Effective Green, g (s)	21.6	39.0		15.0	32.4	48.3	16.9	40.9		15.9	39.9	
Actuated g/C Ratio	0.16	0.29		0.11	0.24	0.36	0.13	0.30		0.12	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	298	1049		207	894	596	233	1099		219	1063	
v/s Ratio Prot	0.14	c0.22		c0.16	c0.27	0.11	0.12	c0.37		c0.17	0.30	
v/s Ratio Perm						0.23						
v/c Ratio	0.87	0.76		1.45	1.12	0.94	0.99	1.22		1.44	1.03	
Uniform Delay, d1	55.3	43.7		60.0	51.3	41.9	58.9	47.0		59.5	47.6	
Progression Factor	1.09	0.85		1.12	0.98	0.86	1.11	0.75		0.90	0.65	
Incremental Delay, d2	21.5	4.8		224.4	64.7	19.4	48.9	107.8		217.4	30.5	
Delay (s)	82.0	41.9		291.7	115.1	55.6	114.1	143.2		270.8	61.6	
Level of Service	F	D		F	F	E	F	F		F	E	
Approach Delay (s)		51.7			125.8			139.0			107.9	
Approach LOS		D			F			F			F	

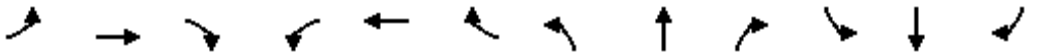
Intersection Summary			
HCM 2000 Control Delay	111.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	802	75	73	1119	169	94	42	68	203	101	226
Future Volume (vph)	166	802	75	73	1119	169	94	42	68	203	101	226
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3669		1862	1961	1619	1863	1961	1667	1863	1961	1667
Flt Permitted	0.05	1.00		0.25	1.00	1.00	0.52	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	93	3669		498	1961	1619	1023	1961	1667	1422	1961	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	178	862	81	77	1178	178	111	49	80	231	115	257
RTOR Reduction (vph)	0	5	0	0	0	49	0	0	74	0	0	161
Lane Group Flow (vph)	178	938	0	77	1178	129	111	49	6	231	115	96
Confl. Peds. (#/hr)	3		2	2		3						
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	92.0	84.0		86.8	81.4	81.4	17.8	9.8	9.8	24.6	13.2	13.2
Effective Green, g (s)	92.0	84.0		86.8	81.4	81.4	17.8	9.8	9.8	24.6	13.2	13.2
Actuated g/C Ratio	0.68	0.62		0.64	0.60	0.60	0.13	0.07	0.07	0.18	0.10	0.10
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	168	2282		374	1182	976	184	142	121	296	191	162
v/s Ratio Prot	c0.06	0.26		0.01	0.60		0.04	0.02		c0.07	0.06	
v/s Ratio Perm	c0.66			0.12		0.08	0.04		0.00	c0.08		0.06
v/c Ratio	1.06	0.41		0.21	1.00	0.13	0.60	0.35	0.05	0.78	0.60	0.60
Uniform Delay, d1	60.2	12.9		16.0	26.7	11.6	56.6	59.5	58.3	51.5	58.4	58.3
Progression Factor	0.83	1.20		0.40	0.59	0.16	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.7	0.0		0.1	12.4	0.1	5.5	1.5	0.2	12.5	5.3	5.8
Delay (s)	89.0	15.5		6.4	28.2	2.0	62.0	61.0	58.4	64.0	63.6	64.1
Level of Service	F	B		A	C	A	E	E	E	E	E	E
Approach Delay (s)		27.2			23.8			60.6			64.0	
Approach LOS		C			C			E			E	

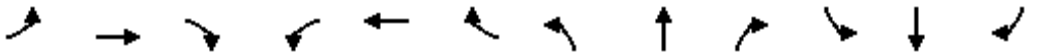
Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	26	433	372	52	45	378	830	222	11	1079	61
Future Volume (vph)	59	26	433	372	52	45	378	830	222	11	1079	61
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	62	27	456	404	57	49	415	912	244	12	1136	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	116	0	0	39
Lane Group Flow (vph)	62	27	456	404	106	0	415	912	128	12	1136	25
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	16.0	16.0	43.4	20.6	20.6		21.4	70.6	70.6	3.0	52.2	52.2
Effective Green, g (s)	16.0	16.0	43.4	20.6	20.6		21.4	70.6	70.6	3.0	52.2	52.2
Actuated g/C Ratio	0.12	0.12	0.32	0.15	0.15		0.16	0.52	0.52	0.02	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	232	942	551	278		572	2799	871	41	2069	644
v/s Ratio Prot	0.03	0.01	c0.16	c0.11	0.06		c0.11	0.17		0.01	c0.21	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.28	0.12	0.48	0.73	0.38		0.73	0.33	0.15	0.29	0.55	0.04
Uniform Delay, d1	54.3	53.2	36.8	54.6	51.5		54.0	18.5	16.6	65.0	32.2	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.67	0.49	0.31	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.4	5.2	1.0		4.2	0.3	0.3	3.9	1.1	0.1
Delay (s)	55.0	53.4	37.2	59.8	52.5		40.5	9.3	5.5	68.9	33.3	25.9
Level of Service	D	D	D	E	D		D	A	A	E	C	C
Approach Delay (s)		40.0			58.3			17.0			33.3	
Approach LOS		D			E			B			C	

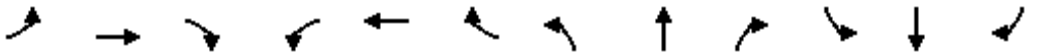
Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	513	256	77	915	102	284	223	47	170	390	186
Future Volume (vph)	133	513	256	77	915	102	284	223	47	170	390	186
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1632	1863	1961	1667	1863	1961	1667
Flt Permitted	0.07	1.00	1.00	0.24	1.00	1.00	0.12	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	138	1961	1667	478	1961	1632	234	1961	1667	827	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	140	540	269	81	963	107	319	251	53	205	470	224
RTOR Reduction (vph)	0	0	85	0	0	52	0	0	37	0	0	54
Lane Group Flow (vph)	140	540	184	81	963	55	319	251	16	205	470	170
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	64.3	56.8	69.8	63.7	56.5	69.0	46.5	33.5	40.7	45.5	33.0	40.5
Effective Green, g (s)	64.3	56.8	69.8	63.7	56.5	69.0	46.5	33.5	40.7	45.5	33.0	40.5
Actuated g/C Ratio	0.48	0.42	0.52	0.47	0.42	0.51	0.34	0.25	0.30	0.34	0.24	0.30
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	161	825	861	299	820	834	237	486	502	374	479	500
v/s Ratio Prot	c0.05	0.28	0.02	0.01	c0.49	0.01	c0.13	0.13	0.00	0.05	0.24	0.02
v/s Ratio Perm	0.36		0.09	0.11		0.03	c0.33		0.01	0.13		0.08
v/c Ratio	0.87	0.65	0.21	0.27	1.17	0.07	1.35	0.52	0.03	0.55	0.98	0.34
Uniform Delay, d1	31.6	31.3	17.7	22.6	39.2	16.7	37.2	43.8	33.3	33.8	50.7	36.8
Progression Factor	0.99	0.85	1.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	33.7	3.7	0.1	0.5	91.2	0.0	181.1	1.1	0.0	1.6	36.2	0.4
Delay (s)	64.9	30.2	28.8	23.1	130.4	16.7	218.3	44.8	33.3	35.4	86.8	37.2
Level of Service	E	C	C	C	F	B	F	D	C	D	F	D
Approach Delay (s)		34.9			112.3			132.7			62.8	
Approach LOS		C			F			F			E	

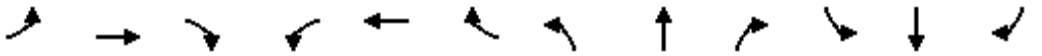
Intersection Summary			
HCM 2000 Control Delay	83.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	108.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	15	87	60	16	547	95	1432	69	476	1485	168
Future Volume (vph)	185	15	87	60	16	547	95	1432	69	476	1485	168
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3422	1667		1887	2933	1863	5316		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3422	1667		1887	2933	1863	5316		3614	3725	1667
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	228	19	107	70	19	636	107	1609	78	501	1563	177
RTOR Reduction (vph)	0	0	92	0	0	86	0	4	0	0	0	58
Lane Group Flow (vph)	114	133	15	0	89	550	107	1683	0	501	1563	119
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	11.5	11.5	19.1		12.2	43.8	7.6	54.9		31.6	78.9	90.4
Effective Green, g (s)	11.5	11.5	19.1		12.2	43.8	7.6	54.9		31.6	78.9	90.4
Actuated g/C Ratio	0.09	0.09	0.14		0.09	0.32	0.06	0.41		0.23	0.58	0.67
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	144	291	235		170	1090	104	2161		845	2177	1116
v/s Ratio Prot	c0.07	0.04	0.00		0.05	c0.12	0.06	c0.32		0.14	c0.42	0.01
v/s Ratio Perm			0.01			0.07						0.06
v/c Ratio	0.79	0.46	0.06		0.52	0.50	1.03	0.78		0.59	0.72	0.11
Uniform Delay, d1	60.6	58.8	50.2		58.6	36.8	63.7	34.8		46.0	20.1	7.9
Progression Factor	1.01	1.01	1.43		1.00	1.00	0.84	1.10		0.93	0.86	1.19
Incremental Delay, d2	24.9	1.1	0.1		3.8	0.4	34.1	0.3		0.9	1.5	0.0
Delay (s)	86.4	60.5	71.8		62.4	37.3	87.6	38.4		43.5	18.8	9.5
Level of Service	F	E	E		E	D	F	D		D	B	A
Approach Delay (s)		72.2			40.3			41.4			23.6	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

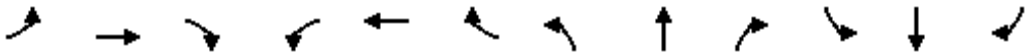
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	65	103	4	64	112	1335	93	108	1016	42
Future Volume (vph)	42	1	65	103	4	64	112	1335	93	108	1016	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1672		1863	1961	1667	1863	3689		1863	3703	
Flt Permitted	0.75	1.00		0.63	1.00	1.00	0.20	1.00		0.10	1.00	
Satd. Flow (perm)	1478	1672		1244	1961	1667	386	3689		203	3703	
Peak-hour factor, PHF	0.60	0.60	0.60	0.72	0.72	0.72	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	70	2	108	143	6	89	123	1467	102	119	1116	46
RTOR Reduction (vph)	0	92	0	0	0	76	0	3	0	0	2	0
Lane Group Flow (vph)	70	18	0	143	6	13	123	1566	0	119	1160	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	19.9	19.9		19.9	19.9	19.9	97.1	89.8		97.1	89.8	
Effective Green, g (s)	19.9	19.9		19.9	19.9	19.9	97.1	89.8		97.1	89.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.72	0.67		0.72	0.67	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	217	246		183	289	245	357	2453		235	2463	
v/s Ratio Prot		0.01			0.00		0.02	c0.42		c0.03	0.31	
v/s Ratio Perm	0.05			c0.11		0.01	0.23			0.34		
v/c Ratio	0.32	0.07		0.78	0.02	0.05	0.34	0.64		0.51	0.47	
Uniform Delay, d1	51.5	49.6		55.5	49.2	49.5	15.2	13.2		29.2	11.0	
Progression Factor	1.04	1.14		1.00	1.00	1.00	1.00	1.00		0.71	0.90	
Incremental Delay, d2	0.9	0.1		19.2	0.0	0.1	0.6	1.3		0.2	0.1	
Delay (s)	54.3	56.6		74.6	49.2	49.5	15.8	14.4		20.8	10.0	
Level of Service	D	E		E	D	D	B	B		C	B	
Approach Delay (s)		55.7			64.6			14.5			11.0	
Approach LOS		E			E			B			B	

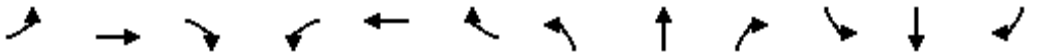
Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	60	7	0	36	43	1424	2	2	1283	56
Future Volume (vph)	40	0	60	7	0	36	43	1424	2	2	1283	56
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1600		1863	3725		1863	3702	
Flt Permitted	0.83	1.00			0.93		0.17	1.00		0.14	1.00	
Satd. Flow (perm)	1632	1667			1492		342	3725		277	3702	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	52	0	78	9	0	46	48	1582	2	2	1351	59
RTOR Reduction (vph)	0	73	0	0	43	0	0	0	0	0	2	0
Lane Group Flow (vph)	52	5	0	0	12	0	48	1584	0	2	1408	0
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Effective Green, g (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Actuated g/C Ratio	0.07	0.07			0.07		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	112			100		286	3116		231	3097	
v/s Ratio Prot		0.00						c0.43			0.38	
v/s Ratio Perm	c0.03				0.01		0.14			0.01		
v/c Ratio	0.47	0.05			0.12		0.17	0.51		0.01	0.45	
Uniform Delay, d1	55.2	53.7			53.9		1.9	2.9		1.7	2.7	
Progression Factor	1.00	1.00			1.00		0.14	0.10		1.00	1.00	
Incremental Delay, d2	3.2	0.2			0.5		0.8	0.4		0.1	0.5	
Delay (s)	58.4	53.8			54.5		1.1	0.7		1.7	3.1	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		55.7			54.5			0.7			3.1	
Approach LOS		E			D			A			A	

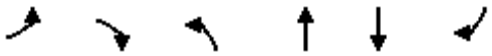
Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	646	417	349	0	1236	0	0	1479	479
Future Volume (vph)	0	0	0	646	417	349	0	1236	0	0	1479	479
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	680	439	367	0	1329	0	0	1557	504
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	0	75
Lane Group Flow (vph)	0	0	0	680	439	341	0	1329	0	0	1557	429
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				38.0	38.0	51.0		71.7			84.7	84.7
Effective Green, g (s)				38.0	38.0	51.0		71.7			84.7	84.7
Actuated g/C Ratio				0.28	0.28	0.38		0.53			0.63	0.63
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1017	551	1108		2843			3358	1045
v/s Ratio Prot				0.19	c0.22	0.12		0.25			c0.29	0.26
v/s Ratio Perm												
v/c Ratio				0.67	0.80	0.31		0.47			0.46	0.41
Uniform Delay, d1				42.9	44.9	29.6		19.7			13.2	12.6
Progression Factor				1.00	1.00	1.00		0.75			0.93	0.97
Incremental Delay, d2				1.7	7.9	0.2		0.4			0.4	1.0
Delay (s)				44.6	52.8	29.7		15.3			12.7	13.2
Level of Service				D	D	C		B			B	B
Approach Delay (s)		0.0			43.3			15.3			12.8	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	285	393	0	1423	1736	0
Future Volume (vph)	285	393	0	1423	1736	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.94	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3478	1517		3725	3725	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3478	1517		3725	3725	
Peak-hour factor, PHF	0.94	0.94	0.86	0.86	0.94	0.94
Adj. Flow (vph)	303	418	0	1655	1847	0
RTOR Reduction (vph)	25	25	0	0	0	0
Lane Group Flow (vph)	466	205	0	1655	1847	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	24.2	24.2		98.8	98.8	
Effective Green, g (s)	24.2	24.2		98.8	98.8	
Actuated g/C Ratio	0.18	0.18		0.73	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	623	271		2726	2726	
v/s Ratio Prot	0.13	c0.14		0.44	c0.50	
v/s Ratio Perm						
v/c Ratio	0.75	0.76		0.61	0.68	
Uniform Delay, d1	52.5	52.6		8.7	9.6	
Progression Factor	1.00	1.00		0.24	0.69	
Incremental Delay, d2	5.1	11.8		0.7	1.2	
Delay (s)	57.6	64.4		2.8	7.9	
Level of Service	E	E		A	A	
Approach Delay (s)	59.8			2.8	7.9	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	923	19	7	1363	16	16
Future Volume (Veh/h)	923	19	7	1363	16	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.63	0.63
Hourly flow rate (vph)	1049	22	8	1482	25	25
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.91		0.81	0.91
vC, conflicting volume			1071		1818	536
vC1, stage 1 conf vol					1060	
vC2, stage 2 conf vol					758	
vCu, unblocked vol			872		1023	282
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	96
cM capacity (veh/h)			697		322	648

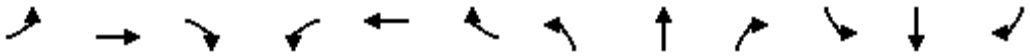
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	699	372	8	741	741	50
Volume Left	0	0	8	0	0	25
Volume Right	0	22	0	0	0	25
cSH	1700	1700	697	1700	1700	431
Volume to Capacity	0.41	0.22	0.01	0.44	0.44	0.12
Queue Length 95th (ft)	0	0	1	0	0	10
Control Delay (s)	0.0	0.0	10.2	0.0	0.0	14.5
Lane LOS			B			B
Approach Delay (s)	0.0		0.1			14.5
Approach LOS						B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1042	14	23	1201	12	8
Future Volume (Veh/h)	1042	14	23	1201	12	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.88	0.88
Hourly flow rate (vph)	1097	15	24	1264	14	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.83		0.46	0.83
vC, conflicting volume			1112		2416	556
vC1, stage 1 conf vol					1104	
vC2, stage 2 conf vol					1312	
vCu, unblocked vol			725		2106	55
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		87	99
cM capacity (veh/h)			725		107	830

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	731	381	24	1264	23
Volume Left	0	0	24	0	14
Volume Right	0	15	0	0	9
cSH	1700	1700	725	1700	162
Volume to Capacity	0.43	0.22	0.03	0.74	0.14
Queue Length 95th (ft)	0	0	3	0	12
Control Delay (s)	0.0	0.0	10.1	0.0	30.8
Lane LOS			B		D
Approach Delay (s)	0.0		0.2		30.8
Approach LOS					D

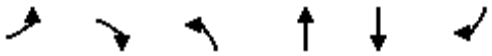
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	75	133	172	153	177	110	134	53	49	169	9
Future Volume (vph)	4	75	133	172	153	177	110	134	53	49	169	9
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90
Hourly flow rate (vph)	5	86	153	212	189	219	128	156	62	54	188	10

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	5	239	212	408	128	218	54	198
Volume Left (vph)	5	0	212	0	128	0	54	0
Volume Right (vph)	0	153	0	219	0	62	0	10
Hadj (s)	0.53	-0.41	0.53	-0.34	0.53	-0.17	0.53	0.00
Departure Headway (s)	8.0	7.0	7.4	6.6	8.0	7.3	8.1	7.6
Degree Utilization, x	0.01	0.47	0.44	0.74	0.28	0.44	0.12	0.42
Capacity (veh/h)	423	487	471	534	433	475	418	452
Control Delay (s)	9.9	14.9	14.9	24.9	12.9	14.6	11.0	14.7
Approach Delay (s)	14.8		21.5		14.0		13.9	
Approach LOS	B		C		B		B	

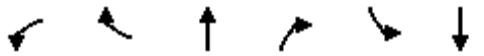
Intersection Summary				
Delay	17.3			
Level of Service	C			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	127	24	21	29	43	141
Future Volume (vph)	127	24	21	29	43	141
Peak Hour Factor	0.95	0.95	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	134	25	24	34	47	153

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	134	25	24	34	200
Volume Left (vph)	134	0	24	0	0
Volume Right (vph)	0	25	0	0	153
Hadj (s)	0.53	-0.67	0.57	0.07	-0.42
Departure Headway (s)	5.6	4.4	5.7	5.2	4.4
Degree Utilization, x	0.21	0.03	0.04	0.05	0.24
Capacity (veh/h)	608	767	605	661	783
Control Delay (s)	8.9	6.4	7.7	7.3	8.8
Approach Delay (s)	8.5		7.4		8.8
Approach LOS	A		A		A

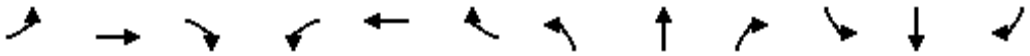
Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	22	1384	32	10	1325
Future Volume (Veh/h)	28	22	1384	32	10	1325
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	32	25	1521	35	11	1395
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.84					
vC, conflicting volume	2258	779			1556	
vC1, stage 1 conf vol	1538					
vC2, stage 2 conf vol	720					
vCu, unblocked vol	2120	779			1556	
tC, single (s)	6.9	7.0			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.2	
p0 queue free %	78	92			97	
cM capacity (veh/h)	148	330			421	

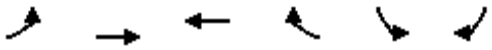
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	32	25	1014	542	11	698	698
Volume Left	32	0	0	0	11	0	0
Volume Right	0	25	0	35	0	0	0
cSH	148	330	1700	1700	421	1700	1700
Volume to Capacity	0.22	0.08	0.60	0.32	0.03	0.41	0.41
Queue Length 95th (ft)	20	6	0	0	2	0	0
Control Delay (s)	35.8	16.8	0.0	0.0	13.8	0.0	0.0
Lane LOS	E	C			B		
Approach Delay (s)	27.5		0.0		0.1		
Approach LOS	D						

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	825	25	16	1296	67	21	7	12	105	8	84
Future Volume (vph)	43	825	25	16	1296	67	21	7	12	105	8	84
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.91		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3709		1845	3662		1863	1779		1863	1692	
Flt Permitted	0.12	1.00		0.29	1.00		0.49	1.00		0.74	1.00	
Satd. Flow (perm)	237	3709		559	3662		952	1779		1458	1692	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	46	878	27	18	1440	74	23	8	13	175	13	140
RTOR Reduction (vph)	0	1	0	0	3	0	0	11	0	0	111	0
Lane Group Flow (vph)	46	904	0	18	1511	0	23	10	0	175	42	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	103.3	96.4		94.1	91.8		18.3	18.3		18.3	18.3	
Effective Green, g (s)	103.3	96.4		94.1	91.8		18.3	18.3		18.3	18.3	
Actuated g/C Ratio	0.77	0.71		0.70	0.68		0.14	0.14		0.14	0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	2648		411	2490		129	241		197	229	
v/s Ratio Prot	c0.01	0.24		0.00	c0.41			0.01			0.03	
v/s Ratio Perm	0.12			0.03			0.02			c0.12		
v/c Ratio	0.17	0.34		0.04	0.61		0.18	0.04		0.89	0.18	
Uniform Delay, d1	15.5	7.3		9.1	11.8		51.7	50.7		57.3	51.7	
Progression Factor	1.00	1.00		0.59	0.67		1.01	1.02		1.02	1.17	
Incremental Delay, d2	0.3	0.4		0.0	0.1		0.7	0.1		34.6	0.4	
Delay (s)	15.8	7.6		5.4	8.0		53.0	52.0		93.1	61.0	
Level of Service	B	A		A	A		D	D		F	E	
Approach Delay (s)		8.0			8.0			52.5			78.1	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	49	40	32	26	0
Future Volume (Veh/h)	0	49	40	32	26	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	43	35	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	78				114	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				114	60
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1520				883	1005

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	53	78	28
Volume Left	0	0	28
Volume Right	0	35	0
cSH	1520	1700	883
Volume to Capacity	0.00	0.05	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	27	46	50	22	36
Future Volume (Veh/h)	48	27	46	50	22	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	29	50	54	24	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			81		220	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		220	66
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	96
cM capacity (veh/h)			1517		742	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	81	104	63
Volume Left	0	50	24
Volume Right	29	0	39
cSH	1700	1517	882
Volume to Capacity	0.05	0.03	0.07
Queue Length 95th (ft)	0	3	6
Control Delay (s)	0.0	3.7	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	9.4
Approach LOS			A

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	96	9	16	142	7	12
Future Volume (Veh/h)	96	9	16	142	7	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	10	17	154	8	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					0.98	
vC, conflicting volume			114		297	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			114		275	109
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1475		694	945

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	114	171	21
Volume Left	0	17	8
Volume Right	10	0	13
cSH	1700	1475	830
Volume to Capacity	0.07	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	0.8	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	9	1587	19	9	1623
Future Volume (Veh/h)	19	9	1587	19	9	1623
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	21	10	1783	21	9	1708
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.82	0.74			0.74	
vC, conflicting volume	2666	605			1804	
vC1, stage 1 conf vol	1794					
vC2, stage 2 conf vol	872					
vCu, unblocked vol	664	0			838	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			98	
cM capacity (veh/h)	281	798			583	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	713	713	378	9	854	854
Volume Left	21	0	0	0	9	0	0
Volume Right	10	0	0	21	0	0	0
cSH	356	1700	1700	1700	583	1700	1700
Volume to Capacity	0.09	0.42	0.42	0.22	0.02	0.50	0.50
Queue Length 95th (ft)	7	0	0	0	1	0	0
Control Delay (s)	16.1	0.0	0.0	0.0	11.3	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	16.1	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	909	57	15	1370	32	10
Future Volume (Veh/h)	909	57	15	1370	32	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	60	16	1442	35	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.43	
vC, conflicting volume			1017		2431	957
vC1, stage 1 conf vol					957	
vC2, stage 2 conf vol					1474	
vCu, unblocked vol			1017		3663	957
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		59	96
cM capacity (veh/h)			682		86	313

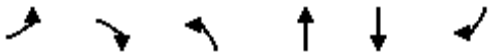
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	957	60	16	1442	46
Volume Left	0	0	16	0	35
Volume Right	0	60	0	0	11
cSH	1700	1700	682	1700	113
Volume to Capacity	0.56	0.04	0.02	0.85	0.41
Queue Length 95th (ft)	0	0	2	0	43
Control Delay (s)	0.0	0.0	10.4	0.0	59.9
Lane LOS			B		F
Approach Delay (s)	0.0		0.1		59.9
Approach LOS					F

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	896	23	0	1385	0	6
Future Volume (Veh/h)	896	23	0	1385	0	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	943	24	0	1458	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.43	
vC, conflicting volume			967		2413	484
vC1, stage 1 conf vol					955	
vC2, stage 2 conf vol					1458	
vCu, unblocked vol			967		3638	484
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			708		77	529

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	629	338	1458	7
Volume Left	0	0	0	0
Volume Right	0	24	0	7
cSH	1700	1700	1700	529
Volume to Capacity	0.37	0.20	0.86	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	11.9
Lane LOS				B
Approach Delay (s)	0.0		0.0	11.9
Approach LOS				B

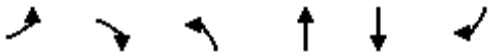
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	30	19	514	714	9
Future Volume (Veh/h)	40	30	19	514	714	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	43	33	21	578	860	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.74	0.74	0.74			
vC, conflicting volume	1486	866	871			
vC1, stage 1 conf vol	866					
vC2, stage 2 conf vol	620					
vCu, unblocked vol	1480	644	651			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	91	97			
cM capacity (veh/h)	317	350	693			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	43	33	21	578	871
Volume Left	43	0	21	0	0
Volume Right	0	33	0	0	11
cSH	317	350	693	1700	1700
Volume to Capacity	0.14	0.09	0.03	0.34	0.51
Queue Length 95th (ft)	12	8	2	0	0
Control Delay (s)	18.1	16.3	10.4	0.0	0.0
Lane LOS	C	C	B		
Approach Delay (s)	17.3		0.4		0.0
Approach LOS	C				

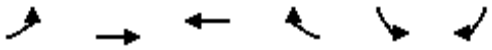
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	9	15	1452	1320	30
Future Volume (Veh/h)	17	9	15	1452	1320	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	18	10	17	1613	1389	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	2246	710	1421			
vC1, stage 1 conf vol	1405					
vC2, stage 2 conf vol	840					
vCu, unblocked vol	2157	443	1236			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	97			
cM capacity (veh/h)	184	504	501			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	10	17	806	806	926	495
Volume Left	18	0	17	0	0	0	0
Volume Right	0	10	0	0	0	0	32
cSH	184	504	501	1700	1700	1700	1700
Volume to Capacity	0.10	0.02	0.03	0.47	0.47	0.54	0.29
Queue Length 95th (ft)	8	2	3	0	0	0	0
Control Delay (s)	26.7	12.3	12.4	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	21.6		0.1			0.0	
Approach LOS	C						

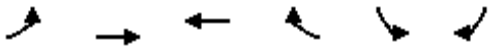
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	194	157	122	93	69
Future Volume (Veh/h)	90	194	157	122	93	69
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	111	240	183	142	101	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	325				596	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325				596	162
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				74	91
cM capacity (veh/h)	1231				396	854

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	111	120	120	122	203	101	75
Volume Left	111	0	0	0	0	101	0
Volume Right	0	0	0	0	142	0	75
cSH	1231	1700	1700	1700	1700	396	854
Volume to Capacity	0.09	0.07	0.07	0.07	0.12	0.26	0.09
Queue Length 95th (ft)	7	0	0	0	0	25	7
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	17.2	9.6
Lane LOS	A					C	A
Approach Delay (s)	2.6			0.0		14.0	
Approach LOS						B	

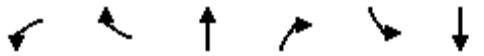
Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	986	1264	73	49	97
Future Volume (Veh/h)	87	986	1264	73	49	97
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	94	1060	1331	77	53	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.88	
vC, conflicting volume	1408				2088	704
vC1, stage 1 conf vol					1370	
vC2, stage 2 conf vol					718	
vCu, unblocked vol	1408				1959	704
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	80				71	72
cM capacity (veh/h)	481				181	379

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	94	530	530	887	521	53	105
Volume Left	94	0	0	0	0	53	0
Volume Right	0	0	0	0	77	0	105
cSH	481	1700	1700	1700	1700	181	379
Volume to Capacity	0.20	0.31	0.31	0.52	0.31	0.29	0.28
Queue Length 95th (ft)	18	0	0	0	0	29	28
Control Delay (s)	14.3	0.0	0.0	0.0	0.0	32.9	18.1
Lane LOS	B					D	C
Approach Delay (s)	1.2			0.0		23.1	
Approach LOS						C	

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	72	9	288	46	9	465
Future Volume (Veh/h)	72	9	288	46	9	465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.90	0.90
Hourly flow rate (vph)	78	10	335	53	10	517
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.96	0.96			0.96	
vC, conflicting volume	898	362			388	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	871	309			337	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	99			99	
cM capacity (veh/h)	305	699			1169	

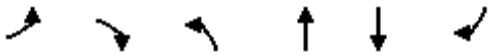
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	78	10	388	10	517
Volume Left	78	0	0	10	0
Volume Right	0	10	53	0	0
cSH	305	699	1700	1169	1700
Volume to Capacity	0.26	0.01	0.23	0.01	0.30
Queue Length 95th (ft)	25	1	0	1	0
Control Delay (s)	20.8	10.2	0.0	8.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	19.6		0.0	0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	157	20	7	493	9	7
Future Volume (Veh/h)	157	20	7	493	9	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.81	0.81	0.92	0.92
Hourly flow rate (vph)	180	23	9	609	10	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			203		818	192
vC1, stage 1 conf vol					192	
vC2, stage 2 conf vol					627	
vCu, unblocked vol			203		818	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1369		500	850

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	203	9	609	10	8
Volume Left	0	9	0	10	0
Volume Right	23	0	0	0	8
cSH	1700	1369	1700	500	850
Volume to Capacity	0.12	0.01	0.36	0.02	0.01
Queue Length 95th (ft)	0	0	0	2	1
Control Delay (s)	0.0	7.6	0.0	12.4	9.3
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		11.0	
Approach LOS				B	

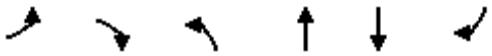
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	39	30	1400	1275	61
Future Volume (Veh/h)	67	39	30	1400	1275	61
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	73	42	33	1556	1342	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.83	0.90	0.90			
vC, conflicting volume	2218	703	1406			
vC1, stage 1 conf vol	1374					
vC2, stage 2 conf vol	844					
vCu, unblocked vol	1491	438	1222			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	92	94			
cM capacity (veh/h)	213	508	508			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	73	42	33	778	778	895	511
Volume Left	73	0	33	0	0	0	0
Volume Right	0	42	0	0	0	0	64
cSH	213	508	508	1700	1700	1700	1700
Volume to Capacity	0.34	0.08	0.06	0.46	0.46	0.53	0.30
Queue Length 95th (ft)	36	7	5	0	0	0	0
Control Delay (s)	30.5	12.7	12.6	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	24.0		0.3			0.0	
Approach LOS	C						

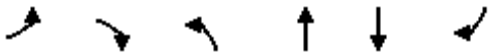
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	0	1467	1329	0
Future Volume (Veh/h)	0	7	0	1467	1329	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	0	8	0	1630	1399	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.83	0.89	0.89			
vC, conflicting volume	2214	700	1399			
vC1, stage 1 conf vol	1399					
vC2, stage 2 conf vol	815					
vCu, unblocked vol	1481	428	1210			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	209	514	512			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	815	815	700	700
Volume Left	0	0	0	0	0
Volume Right	8	0	0	0	0
cSH	514	1700	1700	1700	1700
Volume to Capacity	0.02	0.48	0.48	0.41	0.41
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	12.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	93	6	111	104	3
Future Volume (Veh/h)	39	93	6	111	104	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	65	155	10	185	173	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	288	89	178			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288	89	178			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	84	99			
cM capacity (veh/h)	674	951	1395			

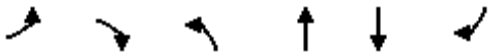
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	65	155	10	92	92	115	63
Volume Left	65	0	10	0	0	0	0
Volume Right	0	155	0	0	0	0	5
cSH	674	951	1395	1700	1700	1700	1700
Volume to Capacity	0.10	0.16	0.01	0.05	0.05	0.07	0.04
Queue Length 95th (ft)	8	15	1	0	0	0	0
Control Delay (s)	10.9	9.5	7.6	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.9		0.4			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1236	472	0	2125
Future Volume (Veh/h)	0	0	1236	472	0	2125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	0	1329	508	0	2237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.90	0.82			0.82	
vC, conflicting volume	2075	664			1837	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	149			1580	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	239	714			338	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	664	664	508	746	746	746
Volume Left	0	0	0	0	0	0
Volume Right	0	0	508	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.39	0.30	0.44	0.44	0.44
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1708	1736	389
Future Volume (Veh/h)	0	0	0	1708	1736	389
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	0	1986	1847	414
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.86	0.82	0.82			
vC, conflicting volume	2840	924	2261			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1884	475	2101			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	54	441	212			

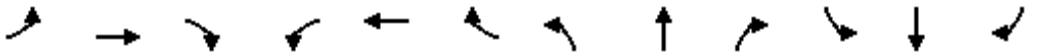
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	993	993	924	924	414
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	414
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.58	0.58	0.54	0.54	0.24
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1423	711	0	2129
Future Volume (Veh/h)	0	0	1423	711	0	2129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	1655	827	0	2265
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.85	0.72			0.72	
vC, conflicting volume	2410	828			2482	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	509	0			2284	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	420	785			158	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	828	828	827	755	755	755
Volume Left	0	0	0	0	0	0
Volume Right	0	0	827	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.49	0.49	0.49	0.44	0.44	0.44
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

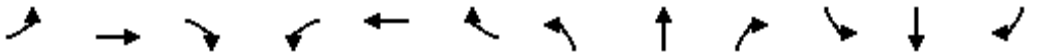
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	296	105	113	304	221	153	610	103	195	587	330
Future Volume (vph)	297	296	105	113	304	221	153	610	103	195	587	330
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3579		1863	3490		1863	3645		1863	3524	
Flt Permitted	0.22	1.00		0.29	1.00		0.13	1.00		0.24	1.00	
Satd. Flow (perm)	438	3579		569	3490		252	3645		463	3524	
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	338	336	119	120	323	235	170	678	114	219	660	371
RTOR Reduction (vph)	0	34	0	0	128	0	0	12	0	0	67	0
Lane Group Flow (vph)	338	421	0	120	430	0	170	780	0	219	964	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	34.3	17.9		34.7	18.1		48.5	41.9		48.5	41.9	
Effective Green, g (s)	34.3	17.9		34.7	18.1		48.5	41.9		48.5	41.9	
Actuated g/C Ratio	0.31	0.16		0.32	0.17		0.44	0.38		0.44	0.38	
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	352	587		378	579		209	1401		290	1354	
v/s Ratio Prot	c0.14	0.12		0.05	0.12		c0.05	0.21		0.05	0.27	
v/s Ratio Perm	c0.16			0.05			c0.31			0.29		
v/c Ratio	0.96	0.72		0.32	0.74		0.81	0.56		0.76	0.71	
Uniform Delay, d1	41.4	43.1		34.7	43.2		39.9	26.3		35.2	28.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.90	0.90	
Incremental Delay, d2	37.4	4.2		0.5	5.1		20.9	1.6		10.1	3.0	
Delay (s)	78.8	47.3		35.2	48.4		60.8	27.9		41.9	28.7	
Level of Service	E	D		D	D		E	C		D	C	
Approach Delay (s)		60.7			46.0			33.7			31.0	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

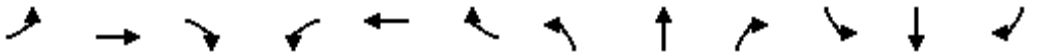
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	518	91	262	604	597	126	909	171	400	849	296
Future Volume (vph)	340	518	91	262	604	597	126	909	171	400	849	296
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3642		1863	3725	1667	1863	3637		1863	3581	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3642		1863	3725	1667	1863	3637		1863	3581	
Peak-hour factor, PHF	0.78	0.78	0.78	0.93	0.93	0.93	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	436	664	117	282	649	642	142	1021	192	444	943	329
RTOR Reduction (vph)	0	11	0	0	0	0	0	12	0	0	26	0
Lane Group Flow (vph)	436	770	0	282	649	642	142	1201	0	444	1246	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	33.0	37.0		17.0	21.0	40.9	12.5	33.9		19.9	41.3	
Effective Green, g (s)	33.0	37.0		17.0	21.0	40.9	12.5	33.9		19.9	41.3	
Actuated g/C Ratio	0.25	0.28		0.13	0.16	0.31	0.09	0.26		0.15	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	465	1020		239	592	516	176	934		280	1120	
v/s Ratio Prot	c0.23	0.21		c0.15	0.17	c0.19	0.08	c0.33		c0.24	0.35	
v/s Ratio Perm						0.20						
v/c Ratio	0.94	0.76		1.18	1.10	1.24	0.81	1.29		1.59	1.11	
Uniform Delay, d1	48.5	43.4		57.5	55.5	45.5	58.6	49.0		56.0	45.4	
Progression Factor	0.95	0.86		1.10	1.02	0.83	1.17	0.92		0.85	0.66	
Incremental Delay, d2	25.4	4.9		108.6	61.6	121.9	20.6	135.8		275.9	60.4	
Delay (s)	71.6	42.1		171.8	118.5	159.7	89.3	181.0		323.6	90.4	
Level of Service	E	D		F	F	F	F	F		F	F	
Approach Delay (s)		52.6			144.9			171.4			150.7	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	133.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



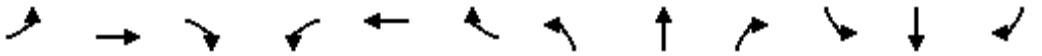
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	898	60	46	953	174	96	41	73	192	39	105
Future Volume (vph)	102	898	60	46	953	174	96	41	73	192	39	105
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3685		1863	1961	1667	1863	1961	1635	1854	1961	1667
Flt Permitted	0.05	1.00		0.23	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	98	3685		445	1961	1667	1423	1961	1635	1417	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	107	945	63	51	1047	191	109	47	83	237	48	130
RTOR Reduction (vph)	0	3	0	0	0	52	0	0	77	0	0	121
Lane Group Flow (vph)	107	1005	0	51	1047	139	109	47	6	237	48	9
Confl. Peds. (#/hr)			1	1					4	4		
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2		2	8		8	4		4
Actuated Green, G (s)	87.6	79.9		82.8	77.5	77.5	22.7	9.0	9.0	22.1	8.7	8.7
Effective Green, g (s)	87.6	79.9		82.8	77.5	77.5	22.7	9.0	9.0	22.1	8.7	8.7
Actuated g/C Ratio	0.66	0.61		0.63	0.59	0.59	0.17	0.07	0.07	0.17	0.07	0.07
Clearance Time (s)	6.2	6.2		6.2	6.2	6.2	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	167	2230		336	1151	978	290	133	111	281	129	109
v/s Ratio Prot	c0.04	0.27		0.01	c0.53		0.04	0.02		c0.09	0.02	
v/s Ratio Perm	0.38			0.09		0.08	0.03		0.00	c0.06		0.01
v/c Ratio	0.64	0.45		0.15	0.91	0.14	0.38	0.35	0.05	0.84	0.37	0.08
Uniform Delay, d1	54.3	14.1		17.5	24.1	12.3	49.0	58.7	57.5	51.9	59.0	57.9
Progression Factor	1.03	1.18		0.49	0.65	0.30	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1		0.1	8.5	0.2	0.8	1.6	0.2	20.0	1.8	0.3
Delay (s)	57.0	16.7		8.7	24.3	3.9	49.8	60.3	57.7	71.9	60.8	58.2
Level of Service	E	B		A	C	A	D	E	E	E	E	E
Approach Delay (s)		20.5			20.7			54.6			66.3	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	126	778	679	153	41	715	945	513	24	1235	78
Future Volume (vph)	118	126	778	679	153	41	715	945	513	24	1235	78
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	134	828	746	168	45	753	995	540	25	1300	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	281	0	0	61
Lane Group Flow (vph)	126	134	828	746	213	0	753	995	259	25	1300	21
Confl. Peds. (#/hr)						2						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.0	12.0	51.1	28.0	28.0		33.1	63.2	63.2	4.0	34.1	34.1
Effective Green, g (s)	12.0	12.0	51.1	28.0	28.0		33.1	63.2	63.2	4.0	34.1	34.1
Actuated g/C Ratio	0.09	0.09	0.39	0.21	0.21		0.25	0.48	0.48	0.03	0.26	0.26
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	178	1135	766	400		906	2562	798	56	1382	424
v/s Ratio Prot	0.07	0.07	c0.28	c0.21	0.11		c0.21	0.19		0.01	c0.24	
v/s Ratio Perm									0.16			0.01
v/c Ratio	0.75	0.75	0.73	0.97	0.53		0.83	0.39	0.32	0.45	0.94	0.05
Uniform Delay, d1	58.5	58.6	34.5	51.6	46.2		46.8	22.0	21.2	62.9	48.0	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	0.69	0.36	1.00	1.00	1.00
Incremental Delay, d2	16.3	16.4	2.4	26.1	1.5		4.0	0.3	0.6	5.6	13.7	0.2
Delay (s)	74.8	74.9	36.9	77.7	47.7		43.9	15.5	8.2	68.5	61.6	37.0
Level of Service	E	E	D	E	D		D	B	A	E	E	D
Approach Delay (s)		46.0			71.1			23.1			60.3	
Approach LOS		D			E			C			E	

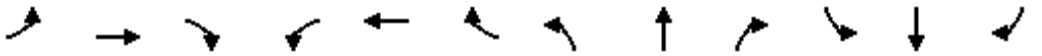
Intersection Summary			
HCM 2000 Control Delay	44.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	585	229	54	718	102	304	203	44	88	231	134
Future Volume (vph)	127	585	229	54	718	102	304	203	44	88	231	134
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	1961	1630	1863	1961	1667	1863	1961	1667
Flt Permitted	0.11	1.00	1.00	0.24	1.00	1.00	0.24	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	220	1961	1667	465	1961	1630	464	1961	1667	910	1961	1667
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	140	643	252	59	789	112	323	216	47	100	262	152
RTOR Reduction (vph)	0	0	100	0	0	48	0	0	36	0	0	80
Lane Group Flow (vph)	140	643	152	59	789	64	323	216	11	100	263	72
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2	7	3	8	5	7	4	1
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	72.3	66.8	79.8	70.1	65.7	76.0	38.5	25.5	29.9	33.1	22.8	28.3
Effective Green, g (s)	72.3	66.8	79.8	70.1	65.7	76.0	38.5	25.5	29.9	33.1	22.8	28.3
Actuated g/C Ratio	0.55	0.51	0.60	0.53	0.50	0.58	0.29	0.19	0.23	0.25	0.17	0.21
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5	6.0	6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	188	992	1007	293	976	938	273	378	377	302	338	357
v/s Ratio Prot	c0.03	0.33	0.01	0.01	c0.40	0.01	c0.12	0.11	0.00	0.03	0.13	0.01
v/s Ratio Perm	0.37		0.08	0.10		0.03	c0.23		0.01	0.06		0.03
v/c Ratio	0.74	0.65	0.15	0.20	0.81	0.07	1.18	0.57	0.03	0.33	0.78	0.20
Uniform Delay, d1	24.7	24.0	11.4	18.3	27.9	12.4	42.8	48.3	39.7	39.3	52.2	42.6
Progression Factor	0.78	0.86	2.77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.3	2.9	0.1	0.3	7.2	0.0	113.4	2.2	0.0	0.6	11.1	0.3
Delay (s)	32.6	23.6	31.5	18.7	35.0	12.4	156.2	50.5	39.8	39.9	63.2	42.9
Level of Service	C	C	C	B	D	B	F	D	D	D	E	D
Approach Delay (s)		26.7			31.4			107.9			52.7	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

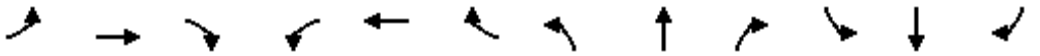


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	28	107	79	9	620	90	1731	93	654	1466	249
Future Volume (vph)	241	28	107	79	9	620	90	1731	93	654	1466	249
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3430	1667		1877	2933	1863	5312		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3430	1667		1877	2933	1863	5312		3614	3725	1667
Peak-hour factor, PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	290	34	129	84	10	660	95	1822	98	688	1543	262
RTOR Reduction (vph)	0	0	111	0	0	87	0	4	0	0	0	91
Lane Group Flow (vph)	145	179	18	0	94	573	95	1916	0	688	1543	171
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	9.0	9.0	18.3		12.6	44.2	9.3	54.0		31.6	76.3	85.3
Effective Green, g (s)	9.0	9.0	18.3		12.6	44.2	9.3	54.0		31.6	76.3	85.3
Actuated g/C Ratio	0.07	0.07	0.14		0.10	0.33	0.07	0.41		0.24	0.58	0.65
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	115	233	231		179	1124	131	2173		865	2153	1077
v/s Ratio Prot	c0.09	0.05	0.01		0.05	c0.12	0.05	c0.36		c0.19	0.41	0.01
v/s Ratio Perm			0.01			0.07						0.09
v/c Ratio	1.26	1.21dl	0.08		0.53	0.51	0.73	0.88		0.80	0.72	0.16
Uniform Delay, d1	61.5	60.5	49.5		56.9	35.2	60.1	36.0		47.2	20.1	9.2
Progression Factor	1.02	1.02	1.30		1.00	1.00	0.89	1.12		0.96	0.88	1.30
Incremental Delay, d2	169.7	14.1	0.1		3.6	0.4	1.8	0.5		2.1	0.8	0.0
Delay (s)	232.3	75.7	64.5		60.4	35.6	55.4	40.9		47.3	18.5	12.0
Level of Service	F	E	E		E	D	E	D		D	B	B
Approach Delay (s)		122.6			38.7			41.6			25.8	
Approach LOS		F			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

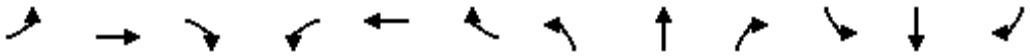
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group



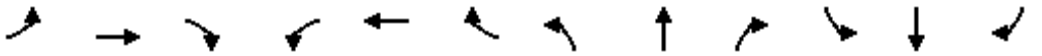
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	65	88	5	103	69	1152	130	130	1048	59
Future Volume (vph)	84	3	65	88	5	103	69	1152	130	130	1048	59
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1679		1863	1961	1643	1863	3669		1863	3696	
Flt Permitted	0.75	1.00		0.69	1.00	1.00	0.20	1.00		0.15	1.00	
Satd. Flow (perm)	1474	1679		1352	1961	1643	396	3669		287	3696	
Peak-hour factor, PHF	0.74	0.74	0.74	0.72	0.72	0.72	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	114	4	88	122	7	143	74	1239	140	137	1103	62
RTOR Reduction (vph)	0	77	0	0	0	125	0	5	0	0	2	0
Lane Group Flow (vph)	114	15	0	122	7	18	74	1374	0	137	1163	0
Confl. Peds. (#/hr)	1					1						
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	17.0	17.0		17.0	17.0	17.0	94.7	88.9		99.3	91.2	
Effective Green, g (s)	17.0	17.0		17.0	17.0	17.0	94.7	88.9		99.3	91.2	
Actuated g/C Ratio	0.13	0.13		0.13	0.13	0.13	0.72	0.67		0.75	0.69	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	189	216		174	252	211	348	2471		312	2553	
v/s Ratio Prot		0.01			0.00		0.01	c0.37		c0.03	0.31	
v/s Ratio Perm	0.08			c0.09		0.01	0.14			0.30		
v/c Ratio	0.60	0.07		0.70	0.03	0.09	0.21	0.56		0.44	0.46	
Uniform Delay, d1	54.3	50.6		55.1	50.3	50.7	12.3	11.2		18.3	9.2	
Progression Factor	1.00	0.99		1.00	1.00	1.00	1.00	1.00		0.75	0.21	
Incremental Delay, d2	5.3	0.1		12.0	0.0	0.2	0.3	0.9		0.1	0.1	
Delay (s)	59.9	50.4		67.1	50.3	50.8	12.6	12.2		13.9	2.0	
Level of Service	E	D		E	D	D	B	B		B	A	
Approach Delay (s)		55.7			58.1			12.2			3.2	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	65	0	0	1	62	1273	1	7	1146	55
Future Volume (vph)	44	0	65	0	0	1	62	1273	1	7	1146	55
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1696		1863	3725		1862	3700	
Flt Permitted	0.76	1.00			1.00		0.21	1.00		0.18	1.00	
Satd. Flow (perm)	1483	1667			1696		404	3725		356	3700	
Peak-hour factor, PHF	0.90	0.90	0.90	0.60	0.60	0.60	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	49	0	72	0	0	2	67	1369	1	7	1206	58
RTOR Reduction (vph)	0	67	0	0	2	0	0	0	0	0	2	0
Lane Group Flow (vph)	49	5	0	0	0	0	67	1370	0	7	1262	0
Confl. Peds. (#/hr)									1	1		
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Effective Green, g (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.82		0.82	0.82	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	107	120			122		330	3051		291	3031	
v/s Ratio Prot		0.00			0.00			c0.37			0.34	
v/s Ratio Perm	c0.03						0.17			0.02		
v/c Ratio	0.46	0.04			0.00		0.20	0.45		0.02	0.42	
Uniform Delay, d1	48.5	47.0			46.9		2.1	2.8		1.8	2.7	
Progression Factor	1.00	1.00			1.00		0.38	0.32		1.00	1.00	
Incremental Delay, d2	3.1	0.1			0.0		1.1	0.4		0.2	0.4	
Delay (s)	51.6	47.2			46.9		1.9	1.3		2.0	3.1	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.0			46.9			1.3			3.1	
Approach LOS		D			D			A			A	

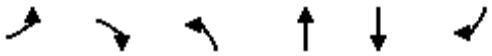
Intersection Summary			
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	814	179	1035	0	1671	0	0	2005	491
Future Volume (vph)	0	0	0	814	179	1035	0	1671	0	0	2005	491
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	925	203	1176	0	1759	0	0	2203	540
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	0	0	0	138
Lane Group Flow (vph)	0	0	0	925	203	1160	0	1759	0	0	2203	402
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				34.0	34.0	56.0		63.7			85.7	85.7
Effective Green, g (s)				34.0	34.0	56.0		63.7			85.7	85.7
Actuated g/C Ratio				0.26	0.26	0.42		0.48			0.65	0.65
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				930	505	1244		2583			3475	1082
v/s Ratio Prot				0.26	0.10	c0.40		c0.33			0.41	0.24
v/s Ratio Perm												
v/c Ratio				0.99	0.40	0.93		0.68			0.63	0.37
Uniform Delay, d1				48.9	40.6	36.2		26.3			13.8	10.7
Progression Factor				1.00	1.00	1.00		0.88			0.96	1.34
Incremental Delay, d2				28.0	0.5	12.6		0.9			0.4	0.4
Delay (s)				76.9	41.1	48.8		24.0			13.6	14.8
Level of Service				E	D	D		C			B	B
Approach Delay (s)		0.0			59.4			24.0			13.8	
Approach LOS		A			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	480	483	0	1770	2200	0
Future Volume (vph)	480	483	0	1770	2200	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3521	1517		3725	3725	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3521	1517		3725	3725	
Peak-hour factor, PHF	0.95	0.95	0.94	0.94	0.94	0.94
Adj. Flow (vph)	505	508	0	1883	2340	0
RTOR Reduction (vph)	4	4	0	0	0	0
Lane Group Flow (vph)	689	316	0	1883	2340	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	33.8	33.8		86.2	86.2	
Effective Green, g (s)	33.8	33.8		86.2	86.2	
Actuated g/C Ratio	0.26	0.26		0.65	0.65	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	901	388		2432	2432	
v/s Ratio Prot	0.20	c0.21		0.51	c0.63	
v/s Ratio Perm						
v/c Ratio	0.76	0.81		0.77	0.96	
Uniform Delay, d1	45.4	46.1		16.1	21.4	
Progression Factor	1.00	1.00		0.43	0.95	
Incremental Delay, d2	4.0	12.6		1.5	8.3	
Delay (s)	49.4	58.7		8.3	28.5	
Level of Service	D	E		A	C	
Approach Delay (s)	52.4			8.3	28.5	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1035	12	15	1017	17	7
Future Volume (Veh/h)	1035	12	15	1017	17	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.87	0.87	0.82	0.82
Hourly flow rate (vph)	1137	13	17	1169	21	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.87		0.91	0.87
vC, conflicting volume			1150		1762	575
vC1, stage 1 conf vol					1144	
vC2, stage 2 conf vol					618	
vCu, unblocked vol			883		1011	225
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		93	99
cM capacity (veh/h)			666		309	680

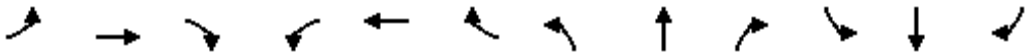
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	758	392	17	584	584	30
Volume Left	0	0	17	0	0	21
Volume Right	0	13	0	0	0	9
cSH	1700	1700	666	1700	1700	369
Volume to Capacity	0.45	0.23	0.03	0.34	0.34	0.08
Queue Length 95th (ft)	0	0	2	0	0	7
Control Delay (s)	0.0	0.0	10.5	0.0	0.0	15.6
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			15.6
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1030	13	8	1289	12	11
Future Volume (Veh/h)	1030	13	8	1289	12	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.63	0.63
Hourly flow rate (vph)	1084	14	8	1357	19	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.85		0.46	0.85
vC, conflicting volume			1098		2464	549
vC1, stage 1 conf vol					1091	
vC2, stage 2 conf vol					1373	
vCu, unblocked vol			754		2352	105
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		79	98
cM capacity (veh/h)			722		91	787

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	723	375	8	1357	36
Volume Left	0	0	8	0	19
Volume Right	0	14	0	0	17
cSH	1700	1700	722	1700	157
Volume to Capacity	0.43	0.22	0.01	0.80	0.23
Queue Length 95th (ft)	0	0	1	0	21
Control Delay (s)	0.0	0.0	10.0	0.0	34.7
Lane LOS			B		D
Approach Delay (s)	0.0		0.1		34.7
Approach LOS					D

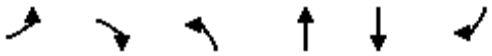
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	96	189	40	88	45	161	92	42	47	103	24
Future Volume (vph)	9	96	189	40	88	45	161	92	42	47	103	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.67	0.67	0.67
Hourly flow rate (vph)	9	101	199	42	93	47	187	107	49	70	154	36

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	9	300	42	140	187	156	70	190
Volume Left (vph)	9	0	42	0	187	0	70	0
Volume Right (vph)	0	199	0	47	0	49	0	36
Hadj (s)	0.53	-0.43	0.53	-0.20	0.53	-0.19	0.53	-0.10
Departure Headway (s)	7.0	6.1	7.2	6.5	6.9	6.2	7.0	6.4
Degree Utilization, x	0.02	0.51	0.08	0.25	0.36	0.27	0.14	0.34
Capacity (veh/h)	481	566	463	516	488	551	481	531
Control Delay (s)	9.0	13.9	9.7	10.5	12.5	10.2	9.9	11.4
Approach Delay (s)	13.8		10.3		11.4		11.0	
Approach LOS	B		B		B		B	

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	47.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	164	38	24	27	23	103
Future Volume (vph)	164	38	24	27	23	103
Peak Hour Factor	0.77	0.77	0.82	0.82	0.77	0.77
Hourly flow rate (vph)	213	49	29	33	30	134

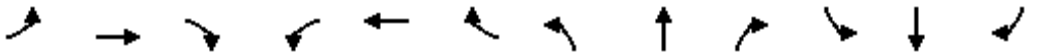
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	213	49	29	33	164
Volume Left (vph)	213	0	29	0	0
Volume Right (vph)	0	49	0	0	134
Hadj (s)	0.53	-0.67	0.53	0.03	-0.46
Departure Headway (s)	5.6	4.4	5.9	5.4	4.6
Degree Utilization, x	0.33	0.06	0.05	0.05	0.21
Capacity (veh/h)	618	783	575	625	732
Control Delay (s)	10.1	6.5	8.0	7.5	8.9
Approach Delay (s)	9.4		7.8		8.9
Approach LOS	A		A		A

Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	15	1330	24	12	1177
Future Volume (Veh/h)	25	15	1330	24	12	1177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	42	25	1462	26	13	1239
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.86					
vC, conflicting volume	2122	745			1489	
vC1, stage 1 conf vol	1476					
vC2, stage 2 conf vol	646					
vCu, unblocked vol	1978	745			1489	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	93			97	
cM capacity (veh/h)	167	356			447	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	42	25	975	513	13	620	620
Volume Left	42	0	0	0	13	0	0
Volume Right	0	25	0	26	0	0	0
cSH	167	356	1700	1700	447	1700	1700
Volume to Capacity	0.25	0.07	0.57	0.30	0.03	0.36	0.36
Queue Length 95th (ft)	24	6	0	0	2	0	0
Control Delay (s)	33.7	15.9	0.0	0.0	13.3	0.0	0.0
Lane LOS	D	C			B		
Approach Delay (s)	27.0		0.0		0.1		
Approach LOS	D						

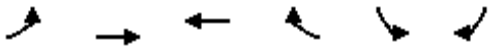
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	965	21	12	962	60	18	11	12	70	11	78
Future Volume (vph)	50	965	21	12	962	60	18	11	12	70	11	78
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3713		1863	3693		1863	1808		1863	1702	
Flt Permitted	0.21	1.00		0.20	1.00		0.47	1.00		0.74	1.00	
Satd. Flow (perm)	420	3713		393	3693		918	1808		1453	1702	
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	61	1177	26	13	1069	67	20	12	13	117	18	130
RTOR Reduction (vph)	0	1	0	0	3	0	0	12	0	0	115	0
Lane Group Flow (vph)	61	1202	0	13	1133	0	20	13	0	117	33	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	103.5	96.5		94.1	91.8		15.2	15.2		15.2	15.2	
Effective Green, g (s)	103.5	96.5		94.1	91.8		15.2	15.2		15.2	15.2	
Actuated g/C Ratio	0.78	0.73		0.71	0.70		0.12	0.12		0.12	0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	405	2714		305	2568		105	208		167	195	
v/s Ratio Prot	c0.01	c0.32		0.00	0.31			0.01			0.02	
v/s Ratio Perm	0.11			0.03			0.02			c0.08		
v/c Ratio	0.15	0.44		0.04	0.44		0.19	0.06		0.70	0.17	
Uniform Delay, d1	7.8	7.1		10.2	8.8		52.8	52.1		56.2	52.7	
Progression Factor	1.00	1.00		0.97	0.78		1.16	1.24		0.97	1.04	
Incremental Delay, d2	0.2	0.5		0.0	0.1		0.9	0.1		12.3	0.4	
Delay (s)	8.0	7.6		10.0	7.0		62.1	64.7		66.7	55.2	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		7.6			7.1			63.6			60.3	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	44	41	24	27	0
Future Volume (Veh/h)	0	44	41	24	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	48	45	26	29	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	71				106	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71				106	58
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1529				892	1008

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	48	71	29
Volume Left	0	0	29
Volume Right	0	26	0
cSH	1529	1700	892
Volume to Capacity	0.00	0.04	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	25	41	40	25	40
Future Volume (Veh/h)	46	25	41	40	25	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	27	45	43	27	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			77		196	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		196	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	96
cM capacity (veh/h)			1522		769	1001

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	77	88	70
Volume Left	0	45	27
Volume Right	27	0	43
cSH	1700	1522	897
Volume to Capacity	0.05	0.03	0.08
Queue Length 95th (ft)	0	2	6
Control Delay (s)	0.0	3.9	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.9	9.4
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	138	9	14	119	9	14
Future Volume (Veh/h)	138	9	14	119	9	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	10	15	129	10	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					1.00	
vC, conflicting volume			160		314	155
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			160		310	155
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1419		673	891

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	160	144	25
Volume Left	0	15	10
Volume Right	10	0	15
cSH	1700	1419	789
Volume to Capacity	0.09	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.9	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	12	1902	16	13	1639
Future Volume (Veh/h)	15	12	1902	16	13	1639
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	13	2002	17	14	1725
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.80	0.78			0.78	
vC, conflicting volume	2901	676			2019	
vC1, stage 1 conf vol	2010					
vC2, stage 2 conf vol	890					
vCu, unblocked vol	1202	0			1302	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			97	
cM capacity (veh/h)	168	841			409	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	801	801	417	14	862	862
Volume Left	16	0	0	0	14	0	0
Volume Right	13	0	0	17	0	0	0
cSH	262	1700	1700	1700	409	1700	1700
Volume to Capacity	0.11	0.47	0.47	0.25	0.03	0.51	0.51
Queue Length 95th (ft)	9	0	0	0	3	0	0
Control Delay (s)	20.5	0.0	0.0	0.0	14.1	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	20.5	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	983	77	20	1136	77	20
Future Volume (Veh/h)	983	77	20	1136	77	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	1080	85	22	1248	84	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.46	
vC, conflicting volume			1165		2372	1080
vC1, stage 1 conf vol					1080	
vC2, stage 2 conf vol					1292	
vCu, unblocked vol			1165		3390	1080
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		35	92
cM capacity (veh/h)			600		129	265

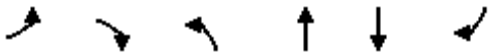
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1080	85	22	1248	106
Volume Left	0	0	22	0	84
Volume Right	0	85	0	0	22
cSH	1700	1700	600	1700	156
Volume to Capacity	0.64	0.05	0.04	0.73	0.68
Queue Length 95th (ft)	0	0	3	0	98
Control Delay (s)	0.0	0.0	11.2	0.0	66.5
Lane LOS			B		F
Approach Delay (s)	0.0		0.2		66.5
Approach LOS					F

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	936	67	0	1156	0	5
Future Volume (Veh/h)	936	67	0	1156	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	1029	74	0	1270	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.48	
vC, conflicting volume			1103		2336	552
vC1, stage 1 conf vol					1066	
vC2, stage 2 conf vol					1270	
vCu, unblocked vol			1103		3239	552
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			629		124	478

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	686	417	1270	5
Volume Left	0	0	0	0
Volume Right	0	74	0	5
cSH	1700	1700	1700	478
Volume to Capacity	0.40	0.25	0.75	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	12.6
Lane LOS				B
Approach Delay (s)	0.0		0.0	12.6
Approach LOS				B

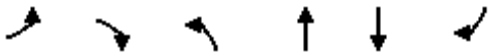
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	34	34	472	497	17
Future Volume (Veh/h)	79	34	34	472	497	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.88	0.88
Hourly flow rate (vph)	86	37	36	502	565	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1148	574	584			
vC1, stage 1 conf vol	574					
vC2, stage 2 conf vol	574					
vCu, unblocked vol	1094	430	441			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	93	96			
cM capacity (veh/h)	425	541	968			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	86	37	36	502	584
Volume Left	86	0	36	0	0
Volume Right	0	37	0	0	19
cSH	425	541	968	1700	1700
Volume to Capacity	0.20	0.07	0.04	0.30	0.34
Queue Length 95th (ft)	19	5	3	0	0
Control Delay (s)	15.6	12.1	8.9	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	14.6		0.6		0.0
Approach LOS	B				

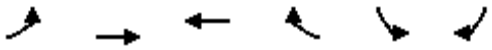
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	12	12	1298	1173	38
Future Volume (Veh/h)	38	12	12	1298	1173	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	41	13	13	1396	1235	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1979	638	1275			
vC1, stage 1 conf vol	1255					
vC2, stage 2 conf vol	724					
vCu, unblocked vol	1869	384	1090			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	98	98			
cM capacity (veh/h)	224	555	574			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	41	13	13	698	698	823	452
Volume Left	41	0	13	0	0	0	0
Volume Right	0	13	0	0	0	0	40
cSH	224	555	574	1700	1700	1700	1700
Volume to Capacity	0.18	0.02	0.02	0.41	0.41	0.48	0.27
Queue Length 95th (ft)	16	2	2	0	0	0	0
Control Delay (s)	24.7	11.6	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	21.5		0.1			0.0	
Approach LOS	C						

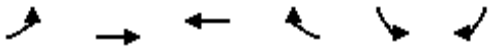
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	243	204	144	133	83
Future Volume (Veh/h)	86	243	204	144	133	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.83	0.83	0.94	0.94	0.92	0.92
Hourly flow rate (vph)	104	293	217	153	145	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	370				648	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370				648	185
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				61	89
cM capacity (veh/h)	1185				368	826

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	104	146	146	145	225	145	90
Volume Left	104	0	0	0	0	145	0
Volume Right	0	0	0	0	153	0	90
cSH	1185	1700	1700	1700	1700	368	826
Volume to Capacity	0.09	0.09	0.09	0.09	0.13	0.39	0.11
Queue Length 95th (ft)	7	0	0	0	0	46	9
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	21.0	9.9
Lane LOS	A					C	A
Approach Delay (s)	2.2			0.0		16.8	
Approach LOS						C	

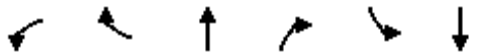
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	1100	1105	44	29	68
Future Volume (Veh/h)	63	1100	1105	44	29	68
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	66	1158	1214	48	32	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.86	
vC, conflicting volume	1262				1949	631
vC1, stage 1 conf vol					1238	
vC2, stage 2 conf vol					711	
vCu, unblocked vol	1262				1773	631
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	88				85	83
cM capacity (veh/h)	547				214	424

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	66	579	579	809	453	32	74
Volume Left	66	0	0	0	0	32	0
Volume Right	0	0	0	0	48	0	74
cSH	547	1700	1700	1700	1700	214	424
Volume to Capacity	0.12	0.34	0.34	0.48	0.27	0.15	0.17
Queue Length 95th (ft)	10	0	0	0	0	13	16
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	24.7	15.3
Lane LOS	B					C	C
Approach Delay (s)	0.7			0.0		18.1	
Approach LOS						C	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	9	286	34	9	323
Future Volume (Veh/h)	50	9	286	34	9	323
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.67	0.67
Hourly flow rate (vph)	54	10	333	40	13	482
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.98	0.98			0.98	
vC, conflicting volume	861	353			373	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	846	325			346	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	99			99	
cM capacity (veh/h)	321	699			1185	

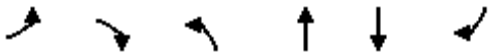
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	54	10	373	13	482
Volume Left	54	0	0	13	0
Volume Right	0	10	40	0	0
cSH	321	699	1700	1185	1700
Volume to Capacity	0.17	0.01	0.22	0.01	0.28
Queue Length 95th (ft)	15	1	0	1	0
Control Delay (s)	18.4	10.2	0.0	8.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	17.2		0.0	0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	168	17	3	165	8	2
Future Volume (Veh/h)	168	17	3	165	8	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	177	18	3	174	9	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			195		366	186
vC1, stage 1 conf vol					186	
vC2, stage 2 conf vol					180	
vCu, unblocked vol			195		366	186
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1378		757	856

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	195	3	174	9	2
Volume Left	0	3	0	9	0
Volume Right	18	0	0	0	2
cSH	1700	1378	1700	757	856
Volume to Capacity	0.11	0.00	0.10	0.01	0.00
Queue Length 95th (ft)	0	0	0	1	0
Control Delay (s)	0.0	7.6	0.0	9.8	9.2
Lane LOS		A		A	A
Approach Delay (s)	0.0	0.1		9.7	
Approach LOS				A	

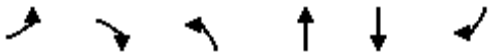
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	15	21	1271	1122	66
Future Volume (Veh/h)	39	15	21	1271	1122	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	42	16	23	1367	1181	69
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.89	0.91	0.91			
vC, conflicting volume	1945	625	1250			
vC1, stage 1 conf vol	1216					
vC2, stage 2 conf vol	730					
vCu, unblocked vol	1375	399	1083			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	97	96			
cM capacity (veh/h)	255	549	584			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	16	23	684	684	787	463
Volume Left	42	0	23	0	0	0	0
Volume Right	0	16	0	0	0	0	69
cSH	255	549	584	1700	1700	1700	1700
Volume to Capacity	0.16	0.03	0.04	0.40	0.40	0.46	0.27
Queue Length 95th (ft)	14	2	3	0	0	0	0
Control Delay (s)	21.9	11.8	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	19.1		0.2			0.0	
Approach LOS	C						

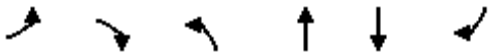
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	3	0	1310	1185	0
Future Volume (Veh/h)	0	3	0	1310	1185	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	3	0	1409	1247	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.90	0.91	0.91			
vC, conflicting volume	1952	624	1247			
vC1, stage 1 conf vol	1247					
vC2, stage 2 conf vol	704					
vCu, unblocked vol	1371	383	1069			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	250	559	588			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	3	704	704	624	624
Volume Left	0	0	0	0	0
Volume Right	3	0	0	0	0
cSH	559	1700	1700	1700	1700
Volume to Capacity	0.01	0.41	0.41	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	11.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.5	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	5	116	127	3
Future Volume (Veh/h)	11	32	5	116	127	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	18	53	8	193	212	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	327	108	217			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327	108	217			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	94	99			
cM capacity (veh/h)	638	924	1350			

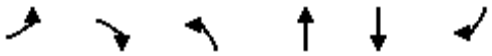
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	53	8	96	96	141	76
Volume Left	18	0	8	0	0	0	0
Volume Right	0	53	0	0	0	0	5
cSH	638	924	1350	1700	1700	1700	1700
Volume to Capacity	0.03	0.06	0.01	0.06	0.06	0.08	0.04
Queue Length 95th (ft)	2	5	0	0	0	0	0
Control Delay (s)	10.8	9.1	7.7	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.6		0.3			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1671	579	0	2819
Future Volume (Veh/h)	0	0	1671	579	0	2819
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	0	0	1759	609	0	3098
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.79	0.66			0.66	
vC, conflicting volume	2792	880			2368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	804	0			2043	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	252	716			180	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	880	880	609	1033	1033	1033
Volume Left	0	0	0	0	0	0
Volume Right	0	0	609	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.52	0.36	0.61	0.61	0.61
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	2250	2200	619
Future Volume (Veh/h)	0	0	0	2250	2200	619
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	2394	2340	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.76	0.72	0.72			
vC, conflicting volume	3537	1170	2999			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2032	450	2999			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	38	400	81			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1197	1197	1170	1170	659
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	659
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.70	0.70	0.69	0.69	0.39
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1770	965	0	2683
Future Volume (Veh/h)	0	0	1770	965	0	2683
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	1883	1027	0	2854
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.59	0.67			0.67	
vC, conflicting volume	2834	942			2910	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			2865	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	601	722			85	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	942	942	1027	951	951	951
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1027	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.55	0.55	0.60	0.56	0.56	0.56
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

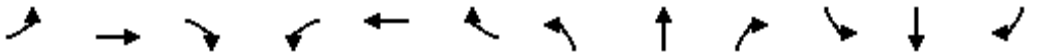
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX B-5. Future (2028) Conditions (with Mitigation) Capacity Analysis Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	374	547	178	87	231	153	126	605	181	156	455	161
Future Volume (vph)	374	547	178	87	231	153	126	605	181	156	455	161
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	3576		3445	3339		3579	3562		3614	3725	1650
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	3576		3445	3339		3579	3562		3614	3725	1650
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	425	622	202	97	257	170	137	658	197	173	506	179
RTOR Reduction (vph)	0	29	0	0	119	0	0	21	0	0	0	77
Lane Group Flow (vph)	425	795	0	97	308	0	137	834	0	173	506	102
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	8		7	4		5	2		1	6	3
Permitted Phases												6
Actuated Green, G (s)	24.6	32.0		8.8	16.2		9.3	42.9		9.3	42.9	67.5
Effective Green, g (s)	24.6	32.0		8.8	16.2		9.3	42.9		9.3	42.9	67.5
Actuated g/C Ratio	0.21	0.27		0.07	0.14		0.08	0.36		0.08	0.36	0.57
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	747	961		254	454		279	1284		282	1342	1027
v/s Ratio Prot	c0.12	c0.22		0.03	0.09		0.04	c0.23		c0.05	0.14	0.02
v/s Ratio Perm												0.04
v/c Ratio	0.57	0.83		0.38	0.68		0.49	0.65		0.61	0.38	0.10
Uniform Delay, d1	42.4	40.9		52.5	48.9		52.6	31.8		53.1	28.2	11.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.96	0.94	0.99
Incremental Delay, d2	1.0	6.0		1.0	4.0		1.4	2.6		3.8	0.8	0.0
Delay (s)	43.4	46.9		53.5	52.9		53.9	34.3		54.8	27.2	11.8
Level of Service	D	D		D	D		D	C		D	C	B
Approach Delay (s)		45.7			53.0			37.0			29.5	
Approach LOS		D			D			D			C	

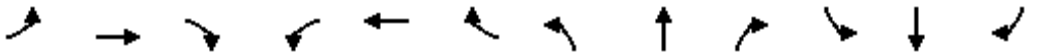
Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



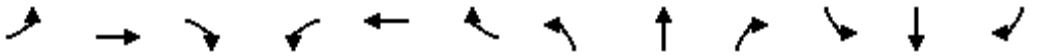
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1042	147	151	344	274	117	983	168	235	562	199
Future Volume (vph)	420	1042	147	151	344	274	117	983	168	235	562	199
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1845	3621		1792	3585	1604	1845	3608		1845	3545	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1845	3621		1792	3585	1604	1845	3608		1845	3545	
Peak-hour factor, PHF	0.87	0.87	0.87	0.85	0.85	0.85	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	483	1198	169	178	405	322	127	1068	183	258	618	219
RTOR Reduction (vph)	0	8	0	0	0	0	0	10	0	0	26	0
Lane Group Flow (vph)	483	1359	0	178	405	322	127	1241	0	258	811	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	37.9	47.0		9.0	18.1	31.0	12.3	40.9		12.9	41.5	
Effective Green, g (s)	37.9	47.0		9.0	18.1	31.0	12.3	40.9		12.9	41.5	
Actuated g/C Ratio	0.28	0.35		0.07	0.14	0.23	0.09	0.31		0.10	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	521	1270		120	484	371	169	1101		177	1097	
v/s Ratio Prot	0.26	c0.38		c0.10	0.11	0.08	0.07	c0.34		c0.14	0.23	
v/s Ratio Perm						0.12						
v/c Ratio	0.93	1.07		1.48	0.84	0.87	0.75	1.13		1.46	0.74	
Uniform Delay, d1	46.7	43.5		62.5	56.5	49.5	59.4	46.5		60.5	41.4	
Progression Factor	0.93	0.90		1.04	0.93	0.90	0.95	0.86		0.82	0.95	
Incremental Delay, d2	19.6	44.0		255.6	15.3	18.5	15.7	68.0		232.3	2.5	
Delay (s)	63.3	83.0		320.5	68.0	63.3	72.2	108.0		282.3	41.8	
Level of Service	E	F		F	E	E	E	F		F	D	
Approach Delay (s)		77.8			116.0			104.7			98.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	95.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



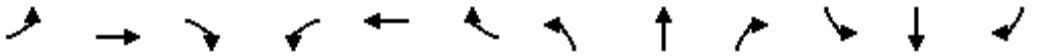
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	927	36	39	591	92	44	25	75	55	9	119
Future Volume (vph)	187	927	36	39	591	92	44	25	75	55	9	119
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1827	3633		1792	3513		1842	1748	1650	1667	1754	1484
Flt Permitted	0.32	1.00		0.23	1.00		0.75	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	611	3633		428	3513		1464	1748	1650	1671	1754	1484
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.88	0.88	0.88	0.70	0.70	0.70
Adj. Flow (vph)	205	1019	40	46	695	108	50	28	85	79	13	170
RTOR Reduction (vph)	0	2	0	0	7	0	0	0	77	0	0	155
Lane Group Flow (vph)	205	1057	0	46	796	0	50	28	8	79	13	15
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	3%	3%	3%	14%	14%	14%
Parking (#/hr)								0				
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		3	8	5	7	4	1
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	96.1	88.4		96.1	88.4		14.6	5.3	13.0	12.4	4.2	11.9
Effective Green, g (s)	96.1	88.4		96.1	88.4		14.6	5.3	13.0	12.4	4.2	11.9
Actuated g/C Ratio	0.72	0.66		0.72	0.66		0.11	0.04	0.10	0.09	0.03	0.09
Clearance Time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	508	2396		385	2317		185	69	236	154	54	200
v/s Ratio Prot	c0.02	c0.29		0.01	0.23		0.02	0.02	0.00	c0.03	0.01	0.00
v/s Ratio Perm	0.27			0.08			0.01		0.00	c0.02		0.01
v/c Ratio	0.40	0.44		0.12	0.34		0.27	0.41	0.03	0.51	0.24	0.08
Uniform Delay, d1	11.2	10.9		11.2	10.0		55.1	62.8	54.8	57.3	63.3	56.0
Progression Factor	0.26	0.72		0.40	0.46		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1		0.1	0.4		0.8	3.9	0.1	2.9	2.3	0.2
Delay (s)	3.0	7.9		4.6	5.0		55.9	66.7	54.9	60.2	65.7	56.2
Level of Service	A	A		A	A		E	E	D	E	E	E
Approach Delay (s)		7.1			5.0			57.2			57.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	82	33	2	3	81	504	94	1	755	15
Future Volume (vph)	5	2	82	33	2	3	81	504	94	1	755	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1810	1905	2850	3321	1647		3579	5301	1650	1863	5353	1667
Peak-hour factor, PHF	0.73	0.73	0.73	0.69	0.69	0.69	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	7	3	112	48	3	4	103	638	119	1	910	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	34	0	0	6
Lane Group Flow (vph)	7	3	112	48	7	0	103	638	85	1	910	12
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	6.0	21.2	6.6	6.6		9.2	95.3	95.3	1.3	87.4	87.4
Effective Green, g (s)	6.0	6.0	21.2	6.6	6.6		9.2	95.3	95.3	1.3	87.4	87.4
Actuated g/C Ratio	0.04	0.04	0.16	0.05	0.05		0.07	0.71	0.71	0.01	0.65	0.65
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	81	85	450	163	81		245	3770	1173	18	3491	1087
v/s Ratio Prot	0.00	0.00	c0.04	c0.01	0.00		c0.03	0.12		0.00	c0.17	
v/s Ratio Perm									0.05			0.01
v/c Ratio	0.09	0.04	0.25	0.29	0.09		0.42	0.17	0.07	0.06	0.26	0.01
Uniform Delay, d1	61.4	61.2	49.4	61.5	60.8		59.8	6.4	5.9	65.7	9.8	8.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.14	0.57	0.49	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.3	1.2	0.5		1.1	0.1	0.1	1.3	0.2	0.0
Delay (s)	61.8	61.4	49.7	62.6	61.4		69.6	3.7	3.0	67.0	9.9	8.2
Level of Service	E	E	D	E	E		E	A	A	E	A	A
Approach Delay (s)		50.7			62.5			11.5			10.0	
Approach LOS		D			E			B			A	

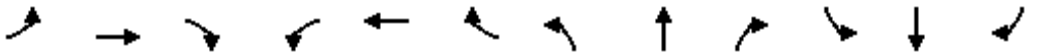
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	629	98	29	375	203	176	273	90	125	131	104
Future Volume (vph)	160	629	98	29	375	203	176	273	90	125	131	104
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1845	1942	1650	1827	3461		3614	1961	1667	1845	1942	1632
Flt Permitted	0.34	1.00	1.00	0.19	1.00		0.95	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	670	1942	1650	362	3461		3614	1961	1667	459	1942	1632
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.95	0.95	0.95	0.85	0.85	0.85
Adj. Flow (vph)	172	676	105	33	421	228	185	287	95	147	154	122
RTOR Reduction (vph)	0	0	45	0	47	0	0	0	73	0	0	93
Lane Group Flow (vph)	172	676	60	33	602	0	185	287	22	147	154	29
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2		3	8	5	7	4	1
Permitted Phases	6		6	2					8	4		4
Actuated Green, G (s)	70.5	65.0	77.1	70.5	65.0		12.1	25.3	30.8	39.6	26.4	31.9
Effective Green, g (s)	70.5	65.0	77.1	70.5	65.0		12.1	25.3	30.8	39.6	26.4	31.9
Actuated g/C Ratio	0.53	0.49	0.58	0.53	0.49		0.09	0.19	0.23	0.30	0.20	0.24
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5		3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	400	942	949	250	1678		326	370	383	272	382	388
v/s Ratio Prot	c0.02	c0.35	0.01	0.01	0.17		0.05	c0.15	0.00	c0.05	0.08	0.00
v/s Ratio Perm	0.21		0.03	0.06					0.01	0.11		0.01
v/c Ratio	0.43	0.72	0.06	0.13	0.36		0.57	0.78	0.06	0.54	0.40	0.07
Uniform Delay, d1	18.0	27.3	12.5	20.1	21.5		58.4	51.7	40.3	37.2	46.9	39.6
Progression Factor	0.47	0.61	1.15	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	4.4	0.0	0.2	0.6		2.3	10.1	0.1	2.2	0.8	0.1
Delay (s)	9.2	21.1	14.5	20.3	22.1		60.7	61.7	40.3	39.4	47.8	39.7
Level of Service	A	C	B	C	C		E	E	D	D	D	D
Approach Delay (s)		18.2			22.0			57.8			42.5	
Approach LOS		B			C			E			D	

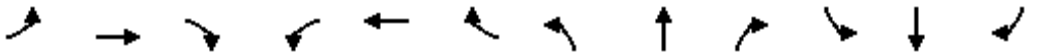
Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	0	31	8	1	93	32	1370	32	240	1047	73
Future Volume (vph)	58	0	31	8	1	93	32	1370	32	240	1047	73
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3390	1667		1875	2933	1845	5283		3579	3689	1650
Flt Permitted	0.95	0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3390	1667		1875	2933	1845	5283		3579	3689	1650
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.86	0.86	0.86	0.88	0.88	0.88
Adj. Flow (vph)	97	0	52	11	1	127	37	1593	37	273	1190	83
RTOR Reduction (vph)	0	0	46	0	0	108	0	2	0	0	0	21
Lane Group Flow (vph)	48	49	6	0	12	19	37	1628	0	273	1190	62
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	9.0	9.0	14.9		3.2	20.0	5.9	80.2		16.8	91.1	100.1
Effective Green, g (s)	9.0	9.0	14.9		3.2	20.0	5.9	80.2		16.8	91.1	100.1
Actuated g/C Ratio	0.07	0.07	0.11		0.02	0.15	0.04	0.60		0.13	0.68	0.75
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	113	227	185		44	577	81	3161		448	2507	1232
v/s Ratio Prot	c0.03	0.01	0.00		c0.01	0.00	0.02	c0.31		c0.08	0.32	0.00
v/s Ratio Perm			0.00			0.00						0.03
v/c Ratio	0.42	0.22	0.03		0.27	0.03	0.46	0.52		0.61	0.47	0.05
Uniform Delay, d1	60.0	59.2	53.1		64.3	48.7	62.5	15.6		55.5	10.1	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.85	0.98		0.82	0.77	1.44
Incremental Delay, d2	2.6	0.5	0.1		4.5	0.0	1.0	0.1		2.3	0.6	0.0
Delay (s)	62.5	59.7	53.2		68.8	48.8	54.3	15.4		47.7	8.4	6.4
Level of Service	E	E	D		E	D	D	B		D	A	A
Approach Delay (s)		58.4			50.5			16.2			15.3	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

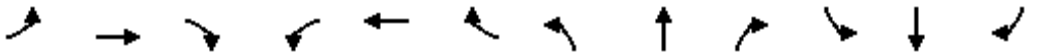


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	14	119	64	2	72	46	1150	66	67	708	19
Future Volume (vph)	50	14	119	64	2	72	46	1150	66	67	708	19
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	1664		1863	1961	1667	1845	3659		1810	3605	
Flt Permitted	0.76	1.00		0.35	1.00	1.00	0.32	1.00		0.17	1.00	
Satd. Flow (perm)	1454	1664		687	1961	1667	630	3659		325	3605	
Peak-hour factor, PHF	0.72	0.72	0.72	0.74	0.74	0.74	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	69	19	165	86	3	97	49	1237	71	74	787	21
RTOR Reduction (vph)	0	145	0	0	0	85	0	2	0	0	1	0
Lane Group Flow (vph)	69	39	0	86	3	12	49	1306	0	74	807	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3	16.3	99.7	95.1		99.7	95.1	
Effective Green, g (s)	16.3	16.3		16.3	16.3	16.3	99.7	95.1		99.7	95.1	
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12	0.74	0.71		0.74	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	202		83	238	202	510	2596		292	2558	
v/s Ratio Prot		0.02			0.00		0.00	c0.36		c0.01	0.22	
v/s Ratio Perm	0.05			c0.13		0.01	0.07			0.18		
v/c Ratio	0.39	0.19		1.04	0.01	0.06	0.10	0.50		0.25	0.32	
Uniform Delay, d1	54.3	52.9		58.9	51.8	52.1	6.5	8.8		12.6	7.3	
Progression Factor	1.02	1.07		1.00	1.00	1.00	1.00	1.00		1.15	0.83	
Incremental Delay, d2	1.4	0.5		109.0	0.0	0.1	0.1	0.7		0.2	0.1	
Delay (s)	56.9	57.2		167.9	51.8	52.2	6.6	9.5		14.6	6.1	
Level of Service	E	E		F	D	D	A	A		B	A	
Approach Delay (s)		57.1			105.7			9.4			6.9	
Approach LOS		E			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

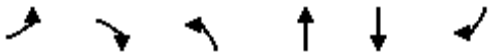
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	39	1	0	5	37	1099	1	17	804	33
Future Volume (vph)	27	0	39	1	0	5	37	1099	1	17	804	33
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1498		1845	3689		1845	3667	
Flt Permitted	0.75	1.00			0.95		0.29	1.00		0.21	1.00	
Satd. Flow (perm)	1475	1667			1434		554	3689		417	3667	
Peak-hour factor, PHF	0.72	0.72	0.72	0.75	0.75	0.75	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	38	0	54	1	0	7	42	1235	1	20	946	39
RTOR Reduction (vph)	0	51	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	38	3	0	0	0	0	42	1236	0	20	983	0
Heavy Vehicles (%)	2%	2%	2%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.4	7.4			7.4		99.8	99.8		99.8	99.8	
Effective Green, g (s)	7.4	7.4			7.4		99.8	99.8		99.8	99.8	
Actuated g/C Ratio	0.06	0.06			0.06		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	91	103			89		464	3093		349	3075	
v/s Ratio Prot		0.00						c0.34			0.27	
v/s Ratio Perm	c0.03				0.00		0.08			0.05		
v/c Ratio	0.42	0.03			0.01		0.09	0.40		0.06	0.32	
Uniform Delay, d1	53.7	52.4			52.3		1.7	2.3		1.6	2.1	
Progression Factor	1.00	1.00			1.00		0.08	0.08		1.00	1.00	
Incremental Delay, d2	3.1	0.1			0.0		0.3	0.3		0.3	0.3	
Delay (s)	56.8	52.6			52.4		0.4	0.5		1.9	2.4	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		54.3			52.4			0.5			2.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	670	61	366	0	478	0	0	797	110
Future Volume (vph)	0	0	0	670	61	366	0	478	0	0	797	110
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3544	1923	2877		5353			5301	1650
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3544	1923	2877		5353			5301	1650
Peak-hour factor, PHF	0.92	0.92	0.92	0.79	0.79	0.79	0.81	0.81	0.81	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	848	77	463	0	590	0	0	839	116
RTOR Reduction (vph)	0	0	0	0	0	225	0	0	0	0	0	44
Lane Group Flow (vph)	0	0	0	848	77	238	0	590	0	0	839	72
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				38.4	38.4	54.4		67.3			83.3	83.3
Effective Green, g (s)				38.4	38.4	54.4		67.3			83.3	83.3
Actuated g/C Ratio				0.29	0.29	0.41		0.50			0.62	0.62
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1015	551	1167		2688			3295	1025
v/s Ratio Prot				c0.24	0.04	0.08		0.11			c0.16	0.04
v/s Ratio Perm												
v/c Ratio				0.84	0.14	0.20		0.22			0.25	0.07
Uniform Delay, d1				44.8	35.5	25.8		18.7			11.4	10.0
Progression Factor				1.00	1.00	1.00		0.90			0.62	0.37
Incremental Delay, d2				6.1	0.1	0.1		0.2			0.2	0.1
Delay (s)				50.9	35.6	25.9		16.9			7.3	3.9
Level of Service				D	D	C		B			A	A
Approach Delay (s)		0.0			41.7			16.9			6.9	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	66	200	0	594	1133	0
Future Volume (vph)	66	200	0	594	1133	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.91	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3360	1502		3725	3689	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3360	1502		3725	3689	
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.86	0.86
Adj. Flow (vph)	73	220	0	667	1317	0
RTOR Reduction (vph)	93	93	0	0	0	0
Lane Group Flow (vph)	90	17	0	667	1317	0
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	9.5	9.5		112.5	112.5	
Effective Green, g (s)	9.5	9.5		112.5	112.5	
Actuated g/C Ratio	0.07	0.07		0.84	0.84	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	238	106		3127	3097	
v/s Ratio Prot	c0.03	0.01		0.18	c0.36	
v/s Ratio Perm						
v/c Ratio	0.38	0.16		0.21	0.43	
Uniform Delay, d1	59.4	58.5		2.1	2.7	
Progression Factor	1.00	1.00		2.96	0.38	
Incremental Delay, d2	1.2	0.8		0.1	0.4	
Delay (s)	60.6	59.4		6.4	1.4	
Level of Service	E	E		A	A	
Approach Delay (s)	60.1			6.4	1.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1604	39	4	656	4	5
Future Volume (Veh/h)	1604	39	4	656	4	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.60	0.60
Hourly flow rate (vph)	1844	45	5	772	7	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.76		0.81	0.76
vC, conflicting volume			1889		2262	944
vC1, stage 1 conf vol					1866	
vC2, stage 2 conf vol					396	
vCu, unblocked vol			1533		1499	286
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		94	99
cM capacity (veh/h)			326		126	539

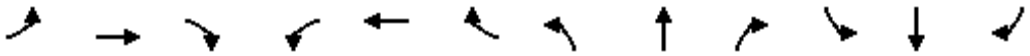
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1229	660	5	386	386	15
Volume Left	0	0	5	0	0	7
Volume Right	0	45	0	0	0	8
cSH	1700	1700	326	1700	1700	213
Volume to Capacity	0.72	0.39	0.02	0.23	0.23	0.07
Queue Length 95th (ft)	0	0	1	0	0	6
Control Delay (s)	0.0	0.0	16.2	0.0	0.0	23.2
Lane LOS			C			C
Approach Delay (s)	0.0		0.1			23.2
Approach LOS						C

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	53.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1096	10	3	662	12	12
Future Volume (Veh/h)	1096	10	3	662	12	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1245	11	3	720	16	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.69		0.72	0.69
vC, conflicting volume			1256		1616	628
vC1, stage 1 conf vol					1250	
vC2, stage 2 conf vol					366	
vCu, unblocked vol			489		729	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	98
cM capacity (veh/h)			734		389	753

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	830	426	3	360	360	32
Volume Left	0	0	3	0	0	16
Volume Right	0	11	0	0	0	16
cSH	1700	1700	734	1700	1700	513
Volume to Capacity	0.49	0.25	0.00	0.21	0.21	0.06
Queue Length 95th (ft)	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	9.9	0.0	0.0	12.5
Lane LOS			A			B
Approach Delay (s)	0.0		0.0			12.5
Approach LOS						B

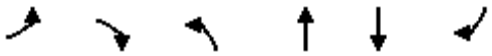
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	39.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	67	23	34	28	43	24	131	79	71	83	3
Future Volume (vph)	14	67	23	34	28	43	24	131	79	71	83	3
Peak Hour Factor	0.95	0.95	0.95	0.75	0.75	0.75	0.82	0.82	0.82	0.74	0.74	0.74
Hourly flow rate (vph)	15	71	24	45	37	57	29	160	96	96	112	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	15	95	45	94	29	256	96	116
Volume Left (vph)	15	0	45	0	29	0	96	0
Volume Right (vph)	0	24	0	57	0	96	0	4
Hadj (s)	0.53	-0.14	0.64	-0.29	0.57	-0.19	0.53	0.01
Departure Headway (s)	6.5	5.8	6.5	5.6	6.0	5.2	6.0	5.5
Degree Utilization, x	0.03	0.15	0.08	0.15	0.05	0.37	0.16	0.18
Capacity (veh/h)	514	575	514	595	573	660	569	623
Control Delay (s)	8.4	8.6	8.9	8.4	8.1	10.1	9.0	8.5
Approach Delay (s)	8.6		8.5		9.9		8.7	
Approach LOS	A		A		A		A	

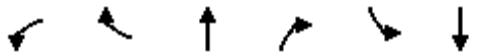
Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	93	7	47	56	6	30
Future Volume (vph)	93	7	47	56	6	30
Peak Hour Factor	0.73	0.73	0.72	0.72	0.88	0.88
Hourly flow rate (vph)	127	10	65	78	7	34

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	127	10	65	78	41
Volume Left (vph)	127	0	65	0	0
Volume Right (vph)	0	10	0	0	34
Hadj (s)	0.53	-0.67	0.53	0.03	-0.46
Departure Headway (s)	5.5	4.3	5.5	5.0	4.4
Degree Utilization, x	0.19	0.01	0.10	0.11	0.05
Capacity (veh/h)	627	801	639	702	777
Control Delay (s)	8.6	6.1	7.9	7.4	7.6
Approach Delay (s)	8.4		7.6		7.6
Approach LOS	A		A		A

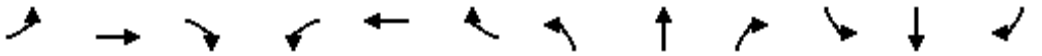
Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	10	1069	27	22	818
Future Volume (Veh/h)	17	10	1069	27	22	818
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	28	17	1125	28	24	899
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.93					
vC, conflicting volume	1636	576			1153	
vC1, stage 1 conf vol	1139					
vC2, stage 2 conf vol	498					
vCu, unblocked vol	1532	576			1153	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	96			96	
cM capacity (veh/h)	249	460			602	

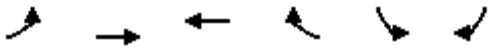
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	28	17	750	403	24	450	450
Volume Left	28	0	0	0	24	0	0
Volume Right	0	17	0	28	0	0	0
cSH	249	460	1700	1700	602	1700	1700
Volume to Capacity	0.11	0.04	0.44	0.24	0.04	0.26	0.26
Queue Length 95th (ft)	9	3	0	0	3	0	0
Control Delay (s)	21.3	13.1	0.0	0.0	11.2	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	18.2		0.0		0.3		
Approach LOS	C						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1601	19	3	612	45	16	5	10	32	2	38
Future Volume (vph)	47	1601	19	3	612	45	16	5	10	32	2	38
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1827	3647		1845	3651		1863	1759		1863	1680	
Flt Permitted	0.37	1.00		0.09	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	720	3647		167	3651		1400	1759		1465	1680	
Peak-hour factor, PHF	0.87	0.87	0.87	0.94	0.94	0.94	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	54	1840	22	3	651	48	17	5	11	53	3	63
RTOR Reduction (vph)	0	0	0	0	3	0	0	10	0	0	59	0
Lane Group Flow (vph)	54	1862	0	3	696	0	17	6	0	53	7	0
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	113.0	105.8		100.0	98.8		9.0	9.0		9.0	9.0	
Effective Green, g (s)	113.0	105.8		100.0	98.8		9.0	9.0		9.0	9.0	
Actuated g/C Ratio	0.84	0.79		0.75	0.74		0.07	0.07		0.07	0.07	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	674	2879		139	2691		94	118		98	112	
v/s Ratio Prot	c0.00	c0.51		0.00	0.19			0.00			0.00	
v/s Ratio Perm	0.06			0.02			0.01			c0.04		
v/c Ratio	0.08	0.65		0.02	0.26		0.18	0.05		0.54	0.06	
Uniform Delay, d1	2.3	6.1		14.4	5.7		59.0	58.5		60.5	58.6	
Progression Factor	1.00	1.00		0.99	1.06		0.97	0.92		1.01	1.06	
Incremental Delay, d2	0.1	1.1		0.0	0.1		0.9	0.2		6.0	0.2	
Delay (s)	2.4	7.2		14.3	6.2		57.9	54.3		67.2	62.2	
Level of Service	A	A		B	A		E	D		E	E	
Approach Delay (s)		7.1			6.2			56.2			64.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	24	31	9	43	0
Future Volume (Veh/h)	0	24	31	9	43	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	34	10	47	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	44				65	39
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	44				65	39
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1564				941	1033

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	26	44	47
Volume Left	0	0	47
Volume Right	0	10	0
cSH	1564	1700	941
Volume to Capacity	0.00	0.03	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	61	6	10	21	19	28
Future Volume (Veh/h)	61	6	10	21	19	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	7	11	23	21	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			73		114	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			73		114	70
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1527		876	993

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	73	34	51
Volume Left	0	11	21
Volume Right	7	0	30
cSH	1700	1527	941
Volume to Capacity	0.04	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	2.4	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	174	2	4	63	6	9
Future Volume (Veh/h)	174	2	4	63	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	2	4	68	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked						
vC, conflicting volume			191		266	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		266	190
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1383		721	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	191	72	17
Volume Left	0	4	7
Volume Right	2	0	10
cSH	1700	1383	793
Volume to Capacity	0.11	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		18.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	3	1431	17	5	1081
Future Volume (Veh/h)	9	3	1431	17	5	1081
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.88	0.88
Hourly flow rate (vph)	10	3	1664	20	6	1228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.84	0.76			0.76	
vC, conflicting volume	2300	565			1684	
vC1, stage 1 conf vol	1674					
vC2, stage 2 conf vol	626					
vCu, unblocked vol	884	0			782	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	307	821			625	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	13	666	666	353	6	614	614
Volume Left	10	0	0	0	6	0	0
Volume Right	3	0	0	20	0	0	0
cSH	359	1700	1700	1700	625	1700	1700
Volume to Capacity	0.04	0.39	0.39	0.21	0.01	0.36	0.36
Queue Length 95th (ft)	3	0	0	0	1	0	0
Control Delay (s)	15.4	0.0	0.0	0.0	10.8	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	15.4	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	900	17	5	650	57	18
Future Volume (Veh/h)	900	17	5	650	57	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	968	18	6	730	62	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.95	
vC, conflicting volume			986		1345	484
vC1, stage 1 conf vol					968	
vC2, stage 2 conf vol					377	
vCu, unblocked vol			986		1263	484
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		80	96
cM capacity (veh/h)			684		310	529

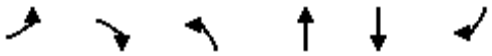
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	484	484	18	6	365	365	82
Volume Left	0	0	0	6	0	0	62
Volume Right	0	0	18	0	0	0	20
cSH	1700	1700	1700	684	1700	1700	410
Volume to Capacity	0.28	0.28	0.01	0.01	0.21	0.21	0.20
Queue Length 95th (ft)	0	0	0	1	0	0	18
Control Delay (s)	0.0	0.0	0.0	10.3	0.0	0.0	17.7
Lane LOS				B			C
Approach Delay (s)	0.0			0.1			17.7
Approach LOS							C

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	885	33	0	655	0	2
Future Volume (Veh/h)	885	33	0	655	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.89	0.89	0.92	0.92
Hourly flow rate (vph)	952	35	0	736	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.90	
vC, conflicting volume			987		1338	494
vC1, stage 1 conf vol					970	
vC2, stage 2 conf vol					368	
vCu, unblocked vol			987		1162	494
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			684		314	521

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	635	352	368	368	2
Volume Left	0	0	0	0	0
Volume Right	0	35	0	0	2
cSH	1700	1700	1700	1700	521
Volume to Capacity	0.37	0.21	0.22	0.22	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

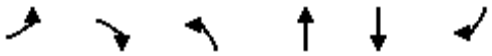
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	13	33	524	244	14
Future Volume (Veh/h)	15	13	33	524	244	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	16	14	35	552	287	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	917	295	303			
vC1, stage 1 conf vol	295					
vC2, stage 2 conf vol	622					
vCu, unblocked vol	874	205	214			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	97			
cM capacity (veh/h)	478	777	1262			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	16	14	35	552	303
Volume Left	16	0	35	0	0
Volume Right	0	14	0	0	16
cSH	478	777	1262	1700	1700
Volume to Capacity	0.03	0.02	0.03	0.32	0.18
Queue Length 95th (ft)	3	1	2	0	0
Control Delay (s)	12.8	9.7	7.9	0.0	0.0
Lane LOS	B	A	A		
Approach Delay (s)	11.4		0.5		0.0
Approach LOS	B				

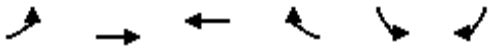
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	15	5	1107	836	8
Future Volume (Veh/h)	30	15	5	1107	836	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	33	16	6	1244	984	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1622	496	993			
vC1, stage 1 conf vol	988					
vC2, stage 2 conf vol	634					
vCu, unblocked vol	1535	338	866			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	293	618	721			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	33	16	6	622	622	656	337
Volume Left	33	0	6	0	0	0	0
Volume Right	0	16	0	0	0	0	9
cSH	293	618	721	1700	1700	1700	1700
Volume to Capacity	0.11	0.03	0.01	0.37	0.37	0.39	0.20
Queue Length 95th (ft)	9	2	1	0	0	0	0
Control Delay (s)	18.8	11.0	10.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	16.3		0.0			0.0	
Approach LOS	C						

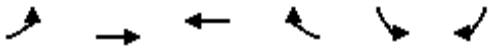
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	44	51	55	45	41
Future Volume (Veh/h)	47	44	51	55	45	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.60	0.60	0.73	0.73	0.92	0.92
Hourly flow rate (vph)	78	73	70	75	49	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	145				300	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	145				300	72
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				92	95
cM capacity (veh/h)	1435				631	975

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	78	36	36	47	98	49	45
Volume Left	78	0	0	0	0	49	0
Volume Right	0	0	0	0	75	0	45
cSH	1435	1700	1700	1700	1700	631	975
Volume to Capacity	0.05	0.02	0.02	0.03	0.06	0.08	0.05
Queue Length 95th (ft)	4	0	0	0	0	6	4
Control Delay (s)	7.7	0.0	0.0	0.0	0.0	11.2	8.9
Lane LOS	A					B	A
Approach Delay (s)	4.0			0.0		10.1	
Approach LOS						B	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	985	664	50	23	58
Future Volume (Veh/h)	72	985	664	50	23	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	79	1082	781	59	25	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.86	
vC, conflicting volume	840				1510	420
vC1, stage 1 conf vol					810	
vC2, stage 2 conf vol					699	
vCu, unblocked vol	840				1274	420
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				92	89
cM capacity (veh/h)	778				333	582

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	79	541	541	521	319	25	63
Volume Left	79	0	0	0	0	25	0
Volume Right	0	0	0	0	59	0	63
cSH	778	1700	1700	1700	1700	333	582
Volume to Capacity	0.10	0.32	0.32	0.31	0.19	0.08	0.11
Queue Length 95th (ft)	8	0	0	0	0	6	9
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	16.7	11.9
Lane LOS	B					C	B
Approach Delay (s)	0.7			0.0		13.3	
Approach LOS						B	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	41	6	228	37	8	132
Future Volume (Veh/h)	41	6	228	37	8	132
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.82	0.82	0.74	0.74
Hourly flow rate (vph)	45	7	278	45	11	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	500	300			323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	465	258			281	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			99	
cM capacity (veh/h)	532	754			1237	

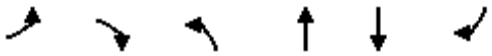
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	45	7	323	11	178
Volume Left	45	0	0	11	0
Volume Right	0	7	45	0	0
cSH	532	754	1700	1237	1700
Volume to Capacity	0.08	0.01	0.19	0.01	0.10
Queue Length 95th (ft)	7	1	0	1	0
Control Delay (s)	12.4	9.8	0.0	7.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	12.0		0.0	0.5	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	198	19	4	100	5	2
Future Volume (Veh/h)	198	19	4	100	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.75	0.75	0.92	0.92
Hourly flow rate (vph)	208	20	5	133	5	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			228		361	218
vC1, stage 1 conf vol					218	
vC2, stage 2 conf vol					143	
vCu, unblocked vol			228		361	218
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1306		756	822

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	228	5	133	5	2
Volume Left	0	5	0	5	0
Volume Right	20	0	0	0	2
cSH	1700	1306	1700	756	822
Volume to Capacity	0.13	0.00	0.08	0.01	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	7.8	0.0	9.8	9.4
Lane LOS		A		A	A
Approach Delay (s)	0.0	0.3		9.7	
Approach LOS				A	

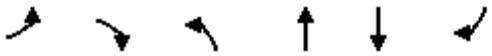
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1112	851	0
Future Volume (Veh/h)	0	0	0	1112	851	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	0	0	0	1249	1001	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.85	0.96	0.96			
vC, conflicting volume	1626	500	1001			
vC1, stage 1 conf vol	1001					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1168	397	918			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	316	578	703			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	0	0	624	624	667	334
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.37	0.37	0.39	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A					
Approach Delay (s)	0.0		0.0			0.0	
Approach LOS	A						

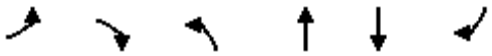
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1112	851	0
Future Volume (Veh/h)	0	0	0	1112	851	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	0	0	0	1249	1001	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.86	0.95	0.95			
vC, conflicting volume	1626	500	1001			
vC1, stage 1 conf vol	1001					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1148	374	899			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	320	594	709			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	624	624	500	500
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.37	0.37	0.29	0.29
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

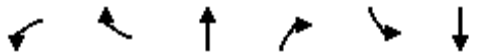
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	6	23	74	66	10
Future Volume (Veh/h)	3	6	23	74	66	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	5	10	38	123	110	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	256	64	127			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	64	127			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	692	988	1457			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	10	38	62	62	73	54
Volume Left	5	0	38	0	0	0	0
Volume Right	0	10	0	0	0	0	17
cSH	692	988	1457	1700	1700	1700	1700
Volume to Capacity	0.01	0.01	0.03	0.04	0.04	0.04	0.03
Queue Length 95th (ft)	1	1	2	0	0	0	0
Control Delay (s)	10.2	8.7	7.5	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.2		1.8			0.0	
Approach LOS	A						

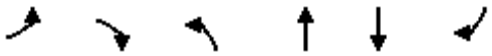
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	478	182	0	1467
Future Volume (Veh/h)	0	0	478	182	0	1467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.81	0.81	0.95	0.95
Hourly flow rate (vph)	0	0	590	225	0	1544
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.93					
vC, conflicting volume	1105	295			815	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	295			815	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	273	701			802	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	295	295	225	515	515	515
Volume Left	0	0	0	0	0	0
Volume Right	0	0	225	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.17	0.13	0.30	0.30	0.30
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	660	1133	334
Future Volume (Veh/h)	0	0	0	660	1133	334
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	0	742	1317	388
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.95	0.93	0.93			
vC, conflicting volume	1688	658	1705			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1453	485	1609			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	115	491	374			

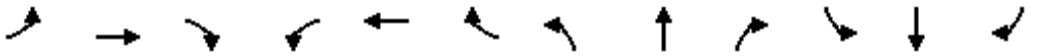
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	371	371	658	658	388
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	388
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.39	0.39	0.23
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	594	923	0	1333
Future Volume (Veh/h)	0	0	594	923	0	1333
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	0	667	1037	0	1550
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.92					
vC, conflicting volume	1184	334			1704	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	334			1704	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	256	662			365	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	334	334	1037	517	517	517
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1037	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.20	0.61	0.30	0.30	0.30
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

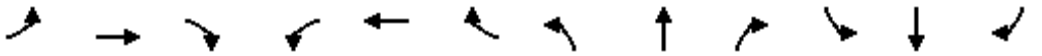
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	317	229	243	602	246	217	763	91	202	803	370
Future Volume (vph)	278	317	229	243	602	246	217	763	91	202	803	370
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	3491		3614	3549		3614	3659		3614	3725	1650
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	3491		3614	3549		3614	3659		3614	3725	1650
Peak-hour factor, PHF	0.89	0.89	0.89	0.93	0.93	0.93	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	312	356	257	261	647	265	238	838	100	213	845	389
RTOR Reduction (vph)	0	122	0	0	37	0	0	7	0	0	0	52
Lane Group Flow (vph)	312	491	0	261	875	0	238	931	0	213	845	337
Confl. Peds. (#/hr)	1					1			3	3		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	8		7	4		5	2		1	6	3
Permitted Phases												6
Actuated Green, G (s)	13.2	22.6		24.3	33.7		11.9	38.2		11.9	38.2	51.4
Effective Green, g (s)	13.2	22.6		24.3	33.7		11.9	38.2		11.9	38.2	51.4
Actuated g/C Ratio	0.11	0.18		0.20	0.27		0.10	0.31		0.10	0.31	0.42
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	387	641		713	972		349	1136		349	1156	778
v/s Ratio Prot	c0.09	0.14		0.07	c0.25		c0.07	c0.25		0.06	0.23	0.05
v/s Ratio Perm												0.16
v/c Ratio	0.81	0.77		0.37	0.90		0.68	0.82		0.61	0.73	0.43
Uniform Delay, d1	53.7	47.7		42.7	43.0		53.7	39.2		53.3	37.8	25.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.95	0.94	0.95
Incremental Delay, d2	11.6	5.5		0.3	11.2		5.4	6.7		2.9	3.8	0.4
Delay (s)	65.3	53.2		43.0	54.3		59.1	45.9		53.7	39.2	24.7
Level of Service	E	D		D	D		E	D		D	D	C
Approach Delay (s)		57.2			51.8			48.6			37.4	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

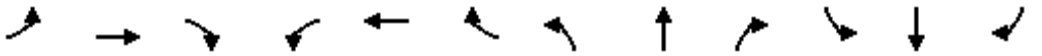
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	594	117	277	918	515	212	1035	215	300	815	240
Future Volume (vph)	228	594	117	277	918	515	212	1035	215	300	815	240
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3634		1863	3725	1667	1863	3629		1863	3598	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3634		1863	3725	1667	1863	3629		1863	3598	
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	259	675	133	301	998	560	230	1125	234	316	858	253
RTOR Reduction (vph)	0	12	0	0	0	0	0	13	0	0	20	0
Lane Group Flow (vph)	259	796	0	301	998	560	230	1346	0	316	1091	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	17.0	31.0		21.0	35.0	49.9	15.9	43.9		14.9	42.9	
Effective Green, g (s)	17.0	31.0		21.0	35.0	49.9	15.9	43.9		14.9	42.9	
Actuated g/C Ratio	0.13	0.23		0.16	0.26	0.37	0.12	0.33		0.11	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	234	834		289	965	616	219	1180		205	1143	
v/s Ratio Prot	0.14	0.22		c0.16	c0.27	0.10	0.12	c0.37		c0.17	0.30	
v/s Ratio Perm						0.24						
v/c Ratio	1.11	0.95		1.04	1.03	0.91	1.05	1.14		1.54	0.95	
Uniform Delay, d1	59.0	51.3		57.0	50.0	40.4	59.5	45.5		60.0	45.1	
Progression Factor	1.18	0.87		1.22	0.88	0.75	1.11	0.74		0.93	0.70	
Incremental Delay, d2	88.7	20.9		62.1	37.1	16.4	68.3	72.1		260.1	13.0	
Delay (s)	158.6	65.6		131.8	80.9	46.5	134.2	105.8		315.9	44.5	
Level of Service	F	E		F	F	D	F	F		F	D	
Approach Delay (s)		88.2			78.8			109.9			104.6	
Approach LOS		F			E			F			F	

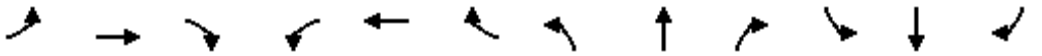
Intersection Summary			
HCM 2000 Control Delay	95.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	802	75	73	1119	169	94	42	68	203	101	226
Future Volume (vph)	166	802	75	73	1119	169	94	42	68	203	101	226
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3669		1862	3638		1863	1961	1667	1863	1961	1667
Flt Permitted	0.12	1.00		0.25	1.00		0.50	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	241	3669		481	3638		981	1961	1667	1422	1961	1667
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	178	862	81	77	1178	178	111	49	80	231	115	257
RTOR Reduction (vph)	0	5	0	0	8	0	0	0	70	0	0	86
Lane Group Flow (vph)	178	938	0	77	1348	0	111	49	10	231	115	171
Confl. Peds. (#/hr)	3		2	2		3						
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		3	8	5	7	4	1
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	87.8	79.0		87.8	79.0		18.5	8.7	17.5	27.1	13.0	21.8
Effective Green, g (s)	87.8	79.0		87.8	79.0		18.5	8.7	17.5	27.1	13.0	21.8
Actuated g/C Ratio	0.65	0.59		0.65	0.59		0.14	0.06	0.13	0.20	0.10	0.16
Clearance Time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	262	2147		402	2128		198	126	292	331	188	345
v/s Ratio Prot	0.04	0.26		0.01	0.37		0.04	0.02	0.00	c0.07	0.06	c0.03
v/s Ratio Perm	c0.40			0.11			0.04		0.00	c0.07		0.07
v/c Ratio	0.68	0.44		0.19	0.63		0.56	0.39	0.04	0.70	0.61	0.50
Uniform Delay, d1	36.7	15.6		16.5	18.5		55.7	60.6	51.4	49.2	58.6	51.6
Progression Factor	0.85	1.78		0.36	0.46		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		0.2	1.1		3.6	2.0	0.0	6.3	5.8	1.1
Delay (s)	31.8	27.8		6.1	9.5		59.3	62.6	51.4	55.5	64.4	52.7
Level of Service	C	C		A	A		E	E	D	E	E	D
Approach Delay (s)		28.4			9.4			57.3			56.0	
Approach LOS		C			A			E			E	

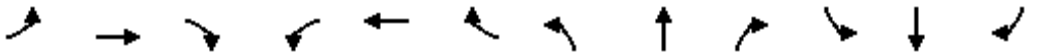
Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	26	433	372	52	45	378	830	222	11	1079	61
Future Volume (vph)	59	26	433	372	52	45	378	830	222	11	1079	61
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1825		3614	5353	1667	1863	5353	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	62	27	456	404	57	49	415	912	244	12	1136	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	116	0	0	39
Lane Group Flow (vph)	62	27	456	404	106	0	415	912	128	12	1136	25
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	16.0	16.0	43.4	20.6	20.6		21.4	71.0	71.0	2.6	52.2	52.2
Effective Green, g (s)	16.0	16.0	43.4	20.6	20.6		21.4	71.0	71.0	2.6	52.2	52.2
Actuated g/C Ratio	0.12	0.12	0.32	0.15	0.15		0.16	0.53	0.53	0.02	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	232	942	551	278		572	2815	876	35	2069	644
v/s Ratio Prot	0.03	0.01	c0.16	c0.11	0.06		c0.11	0.17		0.01	c0.21	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.28	0.12	0.48	0.73	0.38		0.73	0.32	0.15	0.34	0.55	0.04
Uniform Delay, d1	54.3	53.2	36.8	54.6	51.5		54.0	18.3	16.4	65.4	32.2	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.64	0.49	0.32	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.4	5.2	1.0		4.2	0.3	0.3	5.8	1.1	0.1
Delay (s)	55.0	53.4	37.2	59.8	52.5		39.0	9.3	5.6	71.1	33.3	25.9
Level of Service	D	D	D	E	D		D	A	A	E	C	C
Approach Delay (s)		40.0			58.3			16.6			33.3	
Approach LOS		D			E			B			C	

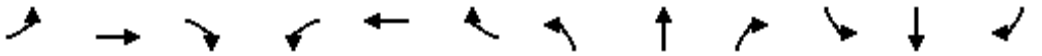
Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	513	256	77	915	102	284	223	47	170	390	186
Future Volume (vph)	133	513	256	77	915	102	284	223	47	170	390	186
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	1667	1863	3660		3614	1961	1667	1863	1961	1667
Flt Permitted	0.10	1.00	1.00	0.20	1.00		0.95	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	203	1961	1667	401	3660		3614	1961	1667	890	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.89	0.89	0.89	0.83	0.83	0.83
Adj. Flow (vph)	140	540	269	81	963	107	319	251	53	205	470	224
RTOR Reduction (vph)	0	0	91	0	6	0	0	0	36	0	0	52
Lane Group Flow (vph)	140	540	178	81	1064	0	319	251	17	205	470	172
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2		3	8	5	7	4	1
Permitted Phases	6		6	2					8	4		4
Actuated Green, G (s)	59.4	51.9	67.2	58.8	51.6		15.3	36.7	43.9	49.8	35.6	43.1
Effective Green, g (s)	59.4	51.9	67.2	58.8	51.6		15.3	36.7	43.9	49.8	35.6	43.1
Actuated g/C Ratio	0.44	0.38	0.50	0.44	0.38		0.11	0.27	0.33	0.37	0.26	0.32
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5		3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	181	753	829	252	1398		409	533	542	430	517	532
v/s Ratio Prot	c0.04	0.28	0.02	0.02	0.29		c0.09	0.13	0.00	0.05	c0.24	0.02
v/s Ratio Perm	c0.30		0.08	0.12					0.01	0.13		0.09
v/c Ratio	0.77	0.72	0.21	0.32	0.76		0.78	0.47	0.03	0.48	0.91	0.32
Uniform Delay, d1	28.0	35.3	19.1	25.9	36.3		58.2	41.0	31.1	30.6	48.1	34.9
Progression Factor	1.06	1.05	1.51	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.9	5.3	0.1	0.7	4.0		9.1	0.8	0.0	0.8	20.1	0.4
Delay (s)	46.6	42.5	28.9	26.6	40.3		67.3	41.8	31.1	31.4	68.2	35.2
Level of Service	D	D	C	C	D		E	D	C	C	E	D
Approach Delay (s)		39.3			39.3			54.0			51.6	
Approach LOS		D			D			D			D	

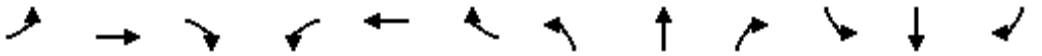
Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	15	87	60	16	547	95	1432	69	476	1485	168
Future Volume (vph)	185	15	87	60	16	547	95	1432	69	476	1485	168
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3422	1667		1887	2933	1863	5316		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3422	1667		1887	2933	1863	5316		3614	3725	1667
Peak-hour factor, PHF	0.81	0.81	0.81	0.86	0.86	0.86	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	228	19	107	70	19	636	107	1609	78	501	1563	177
RTOR Reduction (vph)	0	0	89	0	0	90	0	3	0	0	0	60
Lane Group Flow (vph)	114	133	18	0	89	546	107	1684	0	501	1563	117
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	12.7	12.7	22.9		11.9	40.5	10.2	57.0		28.6	75.4	88.1
Effective Green, g (s)	12.7	12.7	22.9		11.9	40.5	10.2	57.0		28.6	75.4	88.1
Actuated g/C Ratio	0.09	0.09	0.17		0.09	0.30	0.08	0.42		0.21	0.56	0.65
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	159	321	282		166	1018	140	2244		765	2080	1087
v/s Ratio Prot	c0.07	0.04	0.00		0.05	c0.11	0.06	c0.32		0.14	c0.42	0.01
v/s Ratio Perm			0.01			0.07						0.06
v/c Ratio	0.72	0.41	0.06		0.54	0.54	0.76	0.75		0.65	0.75	0.11
Uniform Delay, d1	59.4	57.6	47.1		58.9	39.4	61.2	33.0		48.7	22.7	8.8
Progression Factor	1.01	1.01	1.54		1.00	1.00	0.84	1.05		0.92	0.86	1.54
Incremental Delay, d2	14.3	0.9	0.1		4.2	0.6	2.3	0.2		1.6	1.9	0.0
Delay (s)	74.5	59.2	72.3		63.1	40.0	53.8	34.9		46.4	21.4	13.5
Level of Service	E	E	E		E	D	D	C		D	C	B
Approach Delay (s)		68.1			42.9			36.0			26.4	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

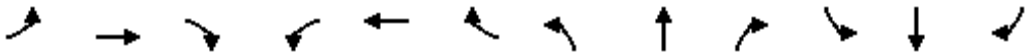
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	65	103	4	64	112	1335	93	108	1016	42
Future Volume (vph)	42	1	65	103	4	64	112	1335	93	108	1016	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1672		1863	1961	1667	1863	3689		1863	3703	
Flt Permitted	0.75	1.00		0.64	1.00	1.00	0.20	1.00		0.10	1.00	
Satd. Flow (perm)	1478	1672		1246	1961	1667	385	3689		202	3703	
Peak-hour factor, PHF	0.60	0.60	0.60	0.72	0.72	0.72	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	70	2	108	143	6	89	123	1467	102	119	1116	46
RTOR Reduction (vph)	0	92	0	0	0	76	0	3	0	0	2	0
Lane Group Flow (vph)	70	18	0	143	6	13	123	1566	0	119	1160	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	20.1	20.1		20.1	20.1	20.1	96.9	89.5		96.9	89.5	
Effective Green, g (s)	20.1	20.1		20.1	20.1	20.1	96.9	89.5		96.9	89.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.72	0.66		0.72	0.66	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	248		185	291	248	357	2445		236	2454	
v/s Ratio Prot		0.01			0.00		0.02	c0.42		c0.03	0.31	
v/s Ratio Perm	0.05			c0.11		0.01	0.23			0.33		
v/c Ratio	0.32	0.07		0.77	0.02	0.05	0.34	0.64		0.50	0.47	
Uniform Delay, d1	51.3	49.4		55.3	49.0	49.3	15.4	13.3		29.6	11.2	
Progression Factor	1.04	1.16		1.00	1.00	1.00	1.00	1.00		0.78	0.87	
Incremental Delay, d2	0.8	0.1		18.0	0.0	0.1	0.6	1.3		0.5	0.2	
Delay (s)	54.2	57.3		73.2	49.1	49.4	16.0	14.6		23.7	9.9	
Level of Service	D	E		E	D	D	B	B		C	A	
Approach Delay (s)		56.1			63.7			14.7			11.2	
Approach LOS		E			E			B			B	

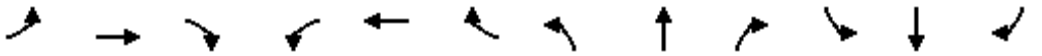
Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	60	7	0	36	43	1424	2	2	1283	56
Future Volume (vph)	40	0	60	7	0	36	43	1424	2	2	1283	56
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1600		1863	3725		1863	3702	
Flt Permitted	0.83	1.00			0.93		0.17	1.00		0.14	1.00	
Satd. Flow (perm)	1632	1667			1492		342	3725		277	3702	
Peak-hour factor, PHF	0.77	0.77	0.77	0.79	0.79	0.79	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	52	0	78	9	0	46	48	1582	2	2	1351	59
RTOR Reduction (vph)	0	73	0	0	43	0	0	0	0	0	2	0
Lane Group Flow (vph)	52	5	0	0	12	0	48	1584	0	2	1408	0
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Effective Green, g (s)	8.3	8.3			8.3		102.9	102.9		102.9	102.9	
Actuated g/C Ratio	0.07	0.07			0.07		0.84	0.84		0.84	0.84	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	112			100		286	3116		231	3097	
v/s Ratio Prot		0.00						c0.43			0.38	
v/s Ratio Perm	c0.03				0.01		0.14			0.01		
v/c Ratio	0.47	0.05			0.12		0.17	0.51		0.01	0.45	
Uniform Delay, d1	55.2	53.7			53.9		1.9	2.9		1.7	2.7	
Progression Factor	1.00	1.00			1.00		0.15	0.13		1.00	1.00	
Incremental Delay, d2	3.2	0.2			0.5		0.9	0.4		0.1	0.5	
Delay (s)	58.4	53.8			54.5		1.2	0.8		1.7	3.1	
Level of Service	E	D			D		A	A		A	A	
Approach Delay (s)		55.7			54.5			0.8			3.1	
Approach LOS		E			D			A			A	

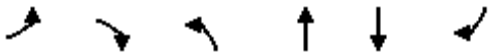
Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	123.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	646	417	349	0	1236	0	0	1479	479
Future Volume (vph)	0	0	0	646	417	349	0	1236	0	0	1479	479
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	680	439	367	0	1329	0	0	1557	504
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	0	75
Lane Group Flow (vph)	0	0	0	680	439	341	0	1329	0	0	1557	429
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				38.0	38.0	51.0		71.7			84.7	84.7
Effective Green, g (s)				38.0	38.0	51.0		71.7			84.7	84.7
Actuated g/C Ratio				0.28	0.28	0.38		0.53			0.63	0.63
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1017	551	1108		2843			3358	1045
v/s Ratio Prot				0.19	c0.22	0.12		0.25			c0.29	0.26
v/s Ratio Perm												
v/c Ratio				0.67	0.80	0.31		0.47			0.46	0.41
Uniform Delay, d1				42.9	44.9	29.6		19.7			13.2	12.6
Progression Factor				1.00	1.00	1.00		0.85			0.93	0.97
Incremental Delay, d2				1.7	7.9	0.2		0.4			0.4	1.0
Delay (s)				44.6	52.8	29.7		17.2			12.7	13.2
Level of Service				D	D	C		B			B	B
Approach Delay (s)		0.0			43.3			17.2			12.8	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	285	393	0	1423	1736	0
Future Volume (vph)	285	393	0	1423	1736	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.94	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3478	1517		3725	3725	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3478	1517		3725	3725	
Peak-hour factor, PHF	0.94	0.94	0.86	0.86	0.94	0.94
Adj. Flow (vph)	303	418	0	1655	1847	0
RTOR Reduction (vph)	19	19	0	0	0	0
Lane Group Flow (vph)	472	211	0	1655	1847	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	25.8	25.8		97.2	97.2	
Effective Green, g (s)	25.8	25.8		97.2	97.2	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	664	289		2682	2682	
v/s Ratio Prot	0.14	c0.14		0.44	c0.50	
v/s Ratio Perm						
v/c Ratio	0.71	0.73		0.62	0.69	
Uniform Delay, d1	51.1	51.3		9.5	10.5	
Progression Factor	1.00	1.00		0.37	0.71	
Incremental Delay, d2	3.7	9.5		0.8	1.3	
Delay (s)	54.8	60.8		4.3	8.7	
Level of Service	D	E		A	A	
Approach Delay (s)	56.7			4.3	8.7	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	923	19	7	1363	16	16
Future Volume (Veh/h)	923	19	7	1363	16	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.63	0.63
Hourly flow rate (vph)	1049	22	8	1482	25	25
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.90		0.79	0.90
vC, conflicting volume			1071		1818	536
vC1, stage 1 conf vol					1060	
vC2, stage 2 conf vol					758	
vCu, unblocked vol			865		960	272
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	96
cM capacity (veh/h)			699		327	656

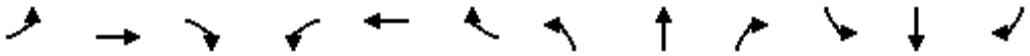
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	699	372	8	741	741	50
Volume Left	0	0	8	0	0	25
Volume Right	0	22	0	0	0	25
cSH	1700	1700	699	1700	1700	436
Volume to Capacity	0.41	0.22	0.01	0.44	0.44	0.11
Queue Length 95th (ft)	0	0	1	0	0	10
Control Delay (s)	0.0	0.0	10.2	0.0	0.0	14.3
Lane LOS			B			B
Approach Delay (s)	0.0		0.1			14.3
Approach LOS						B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1042	14	23	1201	12	8
Future Volume (Veh/h)	1042	14	23	1201	12	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.88	0.88
Hourly flow rate (vph)	1097	15	24	1264	14	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.81		0.87	0.81
vC, conflicting volume			1112		1784	556
vC1, stage 1 conf vol					1104	
vC2, stage 2 conf vol					680	
vCu, unblocked vol			683		656	1
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	99
cM capacity (veh/h)			738		372	883

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	731	381	24	632	632	23
Volume Left	0	0	24	0	0	14
Volume Right	0	15	0	0	0	9
cSH	1700	1700	738	1700	1700	481
Volume to Capacity	0.43	0.22	0.03	0.37	0.37	0.05
Queue Length 95th (ft)	0	0	3	0	0	4
Control Delay (s)	0.0	0.0	10.0	0.0	0.0	12.9
Lane LOS			B			B
Approach Delay (s)	0.0		0.2			12.9
Approach LOS						B

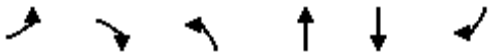
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	75	133	172	153	177	110	134	53	49	169	9
Future Volume (vph)	4	75	133	172	153	177	110	134	53	49	169	9
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.86	0.86	0.86	0.90	0.90	0.90
Hourly flow rate (vph)	5	86	153	212	189	219	128	156	62	54	188	10

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	5	239	212	408	128	218	54	198
Volume Left (vph)	5	0	212	0	128	0	54	0
Volume Right (vph)	0	153	0	219	0	62	0	10
Hadj (s)	0.53	-0.41	0.53	-0.34	0.53	-0.17	0.53	0.00
Departure Headway (s)	8.0	7.0	7.4	6.6	8.0	7.3	8.1	7.6
Degree Utilization, x	0.01	0.47	0.44	0.74	0.28	0.44	0.12	0.42
Capacity (veh/h)	423	487	471	534	433	475	418	452
Control Delay (s)	9.9	14.9	14.9	24.9	12.9	14.6	11.0	14.7
Approach Delay (s)	14.8		21.5		14.0		13.9	
Approach LOS	B		C		B		B	

Intersection Summary				
Delay	17.3			
Level of Service	C			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	127	24	21	29	43	141
Future Volume (vph)	127	24	21	29	43	141
Peak Hour Factor	0.95	0.95	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	134	25	24	34	47	153

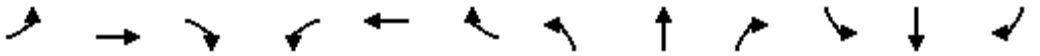
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	134	25	24	34	200
Volume Left (vph)	134	0	24	0	0
Volume Right (vph)	0	25	0	0	153
Hadj (s)	0.53	-0.67	0.57	0.07	-0.42
Departure Headway (s)	5.6	4.4	5.7	5.2	4.4
Degree Utilization, x	0.21	0.03	0.04	0.05	0.24
Capacity (veh/h)	608	767	605	661	783
Control Delay (s)	8.9	6.4	7.7	7.3	8.8
Approach Delay (s)	8.5		7.4		8.8
Approach LOS	A		A		A

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	22	1384	32	10	1325
Future Volume (Veh/h)	28	22	1384	32	10	1325
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	32	25	1521	35	11	1395
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.84					
vC, conflicting volume	2258	779			1556	
vC1, stage 1 conf vol	1538					
vC2, stage 2 conf vol	720					
vCu, unblocked vol	2119	779			1556	
tC, single (s)	6.9	7.0			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.2	
p0 queue free %	78	92			97	
cM capacity (veh/h)	148	330			421	

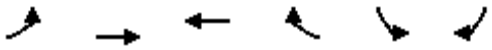
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	32	25	1014	542	11	698	698
Volume Left	32	0	0	0	11	0	0
Volume Right	0	25	0	35	0	0	0
cSH	148	330	1700	1700	421	1700	1700
Volume to Capacity	0.22	0.08	0.60	0.32	0.03	0.41	0.41
Queue Length 95th (ft)	20	6	0	0	2	0	0
Control Delay (s)	35.8	16.8	0.0	0.0	13.8	0.0	0.0
Lane LOS	E	C			B		
Approach Delay (s)	27.5		0.0		0.1		
Approach LOS	D						

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	825	25	16	1296	67	21	7	12	105	8	84
Future Volume (vph)	43	825	25	16	1296	67	21	7	12	105	8	84
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.91		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3709		1845	3662		1863	1779		1863	1692	
Flt Permitted	0.12	1.00		0.29	1.00		0.50	1.00		0.74	1.00	
Satd. Flow (perm)	231	3709		555	3662		984	1779		1458	1692	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	46	878	27	18	1440	74	23	8	13	175	13	140
RTOR Reduction (vph)	0	1	0	0	3	0	0	11	0	0	106	0
Lane Group Flow (vph)	46	904	0	18	1511	0	23	10	0	175	47	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	101.9	95.0		92.7	90.4		19.7	19.7		19.7	19.7	
Effective Green, g (s)	101.9	95.0		92.7	90.4		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.75	0.70		0.69	0.67		0.15	0.15		0.15	0.15	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	2610		403	2452		143	259		212	246	
v/s Ratio Prot	c0.01	0.24		0.00	c0.41			0.01			0.03	
v/s Ratio Perm	0.13			0.03			0.02			c0.12		
v/c Ratio	0.18	0.35		0.04	0.62		0.16	0.04		0.83	0.19	
Uniform Delay, d1	16.8	7.8		9.8	12.5		50.4	49.5		56.0	50.7	
Progression Factor	1.00	1.00		0.50	0.60		1.00	1.02		1.02	1.16	
Incremental Delay, d2	0.3	0.4		0.0	0.3		0.5	0.1		22.2	0.4	
Delay (s)	17.1	8.2		5.0	7.8		51.0	50.6		79.5	59.0	
Level of Service	B	A		A	A		D	D		E	E	
Approach Delay (s)		8.6			7.8			50.8			69.9	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	49	40	32	26	0
Future Volume (Veh/h)	0	49	40	32	26	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	43	35	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	78				114	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				114	60
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1520				883	1005

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	53	78	28
Volume Left	0	0	28
Volume Right	0	35	0
cSH	1520	1700	883
Volume to Capacity	0.00	0.05	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	27	46	50	22	36
Future Volume (Veh/h)	48	27	46	50	22	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	29	50	54	24	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			81		220	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		220	66
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		97	96
cM capacity (veh/h)			1517		742	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	81	104	63
Volume Left	0	50	24
Volume Right	29	0	39
cSH	1700	1517	882
Volume to Capacity	0.05	0.03	0.07
Queue Length 95th (ft)	0	3	6
Control Delay (s)	0.0	3.7	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	9.4
Approach LOS			A

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	96	9	16	142	7	12
Future Volume (Veh/h)	96	9	16	142	7	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	10	17	154	8	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					0.98	
vC, conflicting volume			114		297	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			114		275	109
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1475		694	945

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	114	171	21
Volume Left	0	17	8
Volume Right	10	0	13
cSH	1700	1475	830
Volume to Capacity	0.07	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	0.8	9.4
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	9	1587	19	9	1623
Future Volume (Veh/h)	19	9	1587	19	9	1623
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.95	0.95
Hourly flow rate (vph)	21	10	1783	21	9	1708
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.81	0.73			0.73	
vC, conflicting volume	2666	605			1804	
vC1, stage 1 conf vol	1794					
vC2, stage 2 conf vol	872					
vCu, unblocked vol	569	0			804	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			98	
cM capacity (veh/h)	293	791			595	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	713	713	378	9	854	854
Volume Left	21	0	0	0	9	0	0
Volume Right	10	0	0	21	0	0	0
cSH	368	1700	1700	1700	595	1700	1700
Volume to Capacity	0.08	0.42	0.42	0.22	0.02	0.50	0.50
Queue Length 95th (ft)	7	0	0	0	1	0	0
Control Delay (s)	15.7	0.0	0.0	0.0	11.1	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	15.7	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	909	57	15	1370	32	10
Future Volume (Veh/h)	909	57	15	1370	32	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	60	16	1442	35	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.75	
vC, conflicting volume			1017		1710	478
vC1, stage 1 conf vol					957	
vC2, stage 2 conf vol					753	
vCu, unblocked vol			1017		1289	478
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	98
cM capacity (veh/h)			678		308	533

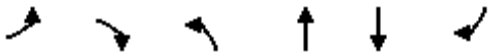
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	478	478	60	16	721	721	46
Volume Left	0	0	0	16	0	0	35
Volume Right	0	0	60	0	0	0	11
cSH	1700	1700	1700	678	1700	1700	404
Volume to Capacity	0.28	0.28	0.04	0.02	0.42	0.42	0.11
Queue Length 95th (ft)	0	0	0	2	0	0	10
Control Delay (s)	0.0	0.0	0.0	10.4	0.0	0.0	16.7
Lane LOS				B			C
Approach Delay (s)	0.0			0.1			16.7
Approach LOS							C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	896	23	0	1385	0	6
Future Volume (Veh/h)	896	23	0	1385	0	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	943	24	0	1458	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.75	
vC, conflicting volume			967		1684	484
vC1, stage 1 conf vol					955	
vC2, stage 2 conf vol					729	
vCu, unblocked vol			967		1239	484
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			708		311	529

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	629	338	729	729	7
Volume Left	0	0	0	0	0
Volume Right	0	24	0	0	7
cSH	1700	1700	1700	1700	529
Volume to Capacity	0.37	0.20	0.43	0.43	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

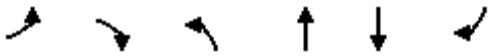
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	30	19	514	714	9
Future Volume (Veh/h)	40	30	19	514	714	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	43	33	21	578	860	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.74	0.74	0.74			
vC, conflicting volume	1486	866	871			
vC1, stage 1 conf vol	866					
vC2, stage 2 conf vol	620					
vCu, unblocked vol	1480	643	650			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	91	97			
cM capacity (veh/h)	317	351	693			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	43	33	21	578	871
Volume Left	43	0	21	0	0
Volume Right	0	33	0	0	11
cSH	317	351	693	1700	1700
Volume to Capacity	0.14	0.09	0.03	0.34	0.51
Queue Length 95th (ft)	12	8	2	0	0
Control Delay (s)	18.1	16.3	10.4	0.0	0.0
Lane LOS	C	C	B		
Approach Delay (s)	17.3		0.4		0.0
Approach LOS	C				

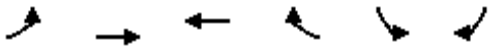
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	9	15	1452	1320	30
Future Volume (Veh/h)	17	9	15	1452	1320	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	18	10	17	1613	1389	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	2246	710	1421			
vC1, stage 1 conf vol	1405					
vC2, stage 2 conf vol	840					
vCu, unblocked vol	2157	443	1236			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	97			
cM capacity (veh/h)	184	504	501			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	10	17	806	806	926	495
Volume Left	18	0	17	0	0	0	0
Volume Right	0	10	0	0	0	0	32
cSH	184	504	501	1700	1700	1700	1700
Volume to Capacity	0.10	0.02	0.03	0.47	0.47	0.54	0.29
Queue Length 95th (ft)	8	2	3	0	0	0	0
Control Delay (s)	26.7	12.3	12.4	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	21.6		0.1			0.0	
Approach LOS	C						

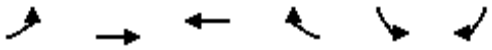
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	194	157	122	93	69
Future Volume (Veh/h)	90	194	157	122	93	69
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.81	0.81	0.86	0.86	0.92	0.92
Hourly flow rate (vph)	111	240	183	142	101	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	325				596	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325				596	162
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				74	91
cM capacity (veh/h)	1231				396	854

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	111	120	120	122	203	101	75
Volume Left	111	0	0	0	0	101	0
Volume Right	0	0	0	0	142	0	75
cSH	1231	1700	1700	1700	1700	396	854
Volume to Capacity	0.09	0.07	0.07	0.07	0.12	0.26	0.09
Queue Length 95th (ft)	7	0	0	0	0	25	7
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	17.2	9.6
Lane LOS	A					C	A
Approach Delay (s)	2.6			0.0		14.0	
Approach LOS						B	

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	27.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	986	1264	73	49	97
Future Volume (Veh/h)	87	986	1264	73	49	97
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	94	1060	1331	77	53	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.86	
vC, conflicting volume	1408				2088	704
vC1, stage 1 conf vol					1370	
vC2, stage 2 conf vol					718	
vCu, unblocked vol	1408				1944	704
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	80				71	72
cM capacity (veh/h)	481				182	379

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	94	530	530	887	521	53	105
Volume Left	94	0	0	0	0	53	0
Volume Right	0	0	0	0	77	0	105
cSH	481	1700	1700	1700	1700	182	379
Volume to Capacity	0.20	0.31	0.31	0.52	0.31	0.29	0.28
Queue Length 95th (ft)	18	0	0	0	0	29	28
Control Delay (s)	14.3	0.0	0.0	0.0	0.0	32.7	18.1
Lane LOS	B					D	C
Approach Delay (s)	1.2			0.0		23.0	
Approach LOS						C	

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	72	9	288	46	9	465
Future Volume (Veh/h)	72	9	288	46	9	465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.90	0.90
Hourly flow rate (vph)	78	10	335	53	10	517
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	898	362			388	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	303			331	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	99			99	
cM capacity (veh/h)	305	701			1169	

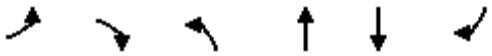
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	78	10	388	10	517
Volume Left	78	0	0	10	0
Volume Right	0	10	53	0	0
cSH	305	701	1700	1169	1700
Volume to Capacity	0.26	0.01	0.23	0.01	0.30
Queue Length 95th (ft)	25	1	0	1	0
Control Delay (s)	20.8	10.2	0.0	8.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	19.6		0.0	0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	157	20	7	493	9	7
Future Volume (Veh/h)	157	20	7	493	9	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.81	0.81	0.92	0.92
Hourly flow rate (vph)	180	23	9	609	10	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			203		818	192
vC1, stage 1 conf vol					192	
vC2, stage 2 conf vol					627	
vCu, unblocked vol			203		818	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1369		500	850

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	203	9	609	10	8
Volume Left	0	9	0	10	0
Volume Right	23	0	0	0	8
cSH	1700	1369	1700	500	850
Volume to Capacity	0.12	0.01	0.36	0.02	0.01
Queue Length 95th (ft)	0	0	0	2	1
Control Delay (s)	0.0	7.6	0.0	12.4	9.3
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		11.0	
Approach LOS				B	

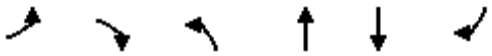
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	39	30	1400	1275	61
Future Volume (Veh/h)	67	39	30	1400	1275	61
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	73	42	33	1556	1342	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.82	0.90	0.90			
vC, conflicting volume	2218	703	1406			
vC1, stage 1 conf vol	1374					
vC2, stage 2 conf vol	844					
vCu, unblocked vol	1484	438	1222			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	92	94			
cM capacity (veh/h)	213	508	508			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	73	42	33	778	778	895	511
Volume Left	73	0	33	0	0	0	0
Volume Right	0	42	0	0	0	0	64
cSH	213	508	508	1700	1700	1700	1700
Volume to Capacity	0.34	0.08	0.06	0.46	0.46	0.53	0.30
Queue Length 95th (ft)	36	7	5	0	0	0	0
Control Delay (s)	30.4	12.7	12.6	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	24.0		0.3			0.0	
Approach LOS	C						

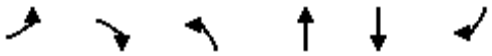
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	0	1467	1329	0
Future Volume (Veh/h)	0	7	0	1467	1329	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.90	0.90	0.95	0.95
Hourly flow rate (vph)	0	8	0	1630	1399	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.83	0.89	0.89			
vC, conflicting volume	2214	700	1399			
vC1, stage 1 conf vol	1399					
vC2, stage 2 conf vol	815					
vCu, unblocked vol	1474	428	1210			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	209	514	512			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	815	815	700	700
Volume Left	0	0	0	0	0
Volume Right	8	0	0	0	0
cSH	514	1700	1700	1700	1700
Volume to Capacity	0.02	0.48	0.48	0.41	0.41
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	12.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	93	6	111	104	3
Future Volume (Veh/h)	39	93	6	111	104	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	65	155	10	185	173	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	288	89	178			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288	89	178			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	84	99			
cM capacity (veh/h)	674	951	1395			

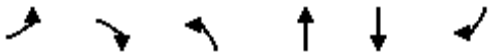
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	65	155	10	92	92	115	63
Volume Left	65	0	10	0	0	0	0
Volume Right	0	155	0	0	0	0	5
cSH	674	951	1395	1700	1700	1700	1700
Volume to Capacity	0.10	0.16	0.01	0.05	0.05	0.07	0.04
Queue Length 95th (ft)	8	15	1	0	0	0	0
Control Delay (s)	10.9	9.5	7.6	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.9		0.4			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1236	472	0	2125
Future Volume (Veh/h)	0	0	1236	472	0	2125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	0	1329	508	0	2237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.89	0.81			0.81	
vC, conflicting volume	2075	664			1837	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	908	115			1564	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	244	741			339	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	664	664	508	746	746	746
Volume Left	0	0	0	0	0	0
Volume Right	0	0	508	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.39	0.30	0.44	0.44	0.44
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

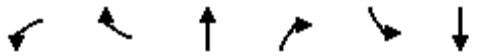
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1708	1736	389
Future Volume (Veh/h)	0	0	0	1708	1736	389
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	0	1986	1847	414
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.85	0.82	0.82			
vC, conflicting volume	2840	924	2261			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1872	475	2101			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	54	441	212			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	993	993	924	924	414
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	414
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.58	0.58	0.54	0.54	0.24
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

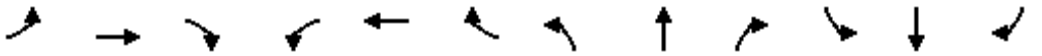
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1423	711	0	2129
Future Volume (Veh/h)	0	0	1423	711	0	2129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.94	0.94
Hourly flow rate (vph)	0	0	1655	827	0	2265
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.86	0.73			0.73	
vC, conflicting volume	2410	828			2482	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	466	28			2291	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	454	760			159	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	828	828	827	755	755	755
Volume Left	0	0	0	0	0	0
Volume Right	0	0	827	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.49	0.49	0.49	0.44	0.44	0.44
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

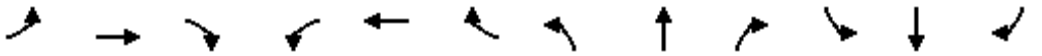
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	296	105	113	304	221	153	610	103	195	587	330
Future Volume (vph)	297	296	105	113	304	221	153	610	103	195	587	330
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	3579		3614	3490		3614	3645		3614	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	3579		3614	3490		3614	3645		3614	3725	1667
Peak-hour factor, PHF	0.88	0.88	0.88	0.94	0.94	0.94	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	338	336	119	120	323	235	170	678	114	219	660	371
RTOR Reduction (vph)	0	35	0	0	130	0	0	11	0	0	0	69
Lane Group Flow (vph)	338	420	0	120	428	0	170	781	0	219	660	302
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	8		7	4		5	2		1	6	3
Permitted Phases												6
Actuated Green, G (s)	14.9	17.9		15.3	18.3		9.4	40.4		9.4	40.4	55.3
Effective Green, g (s)	14.9	17.9		15.3	18.3		9.4	40.4		9.4	40.4	55.3
Actuated g/C Ratio	0.14	0.16		0.14	0.17		0.09	0.37		0.09	0.37	0.51
Clearance Time (s)	6.6	6.6		6.6	6.6		6.4	6.4		6.4	6.4	6.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	494	587		507	585		311	1350		311	1380	946
v/s Ratio Prot	c0.09	0.12		0.03	c0.12		0.05	c0.21		c0.06	0.18	0.04
v/s Ratio Perm												0.14
v/c Ratio	0.68	0.72		0.24	0.73		0.55	0.58		0.70	0.48	0.32
Uniform Delay, d1	44.8	43.1		41.7	43.0		47.8	27.5		48.4	26.2	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.95	0.92	1.00
Incremental Delay, d2	3.9	4.1		0.2	4.7		2.0	1.8		6.7	1.1	0.2
Delay (s)	48.7	47.3		41.9	47.7		49.7	29.3		52.5	25.3	15.9
Level of Service	D	D		D	D		D	C		D	C	B
Approach Delay (s)		47.9			46.7			32.9			27.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

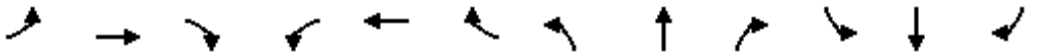
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	518	91	262	604	597	126	909	171	400	849	296
Future Volume (vph)	340	518	91	262	604	597	126	909	171	400	849	296
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3642		1863	3725	1667	1863	3637		1863	3581	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1863	3642		1863	3725	1667	1863	3637		1863	3581	
Peak-hour factor, PHF	0.78	0.78	0.78	0.93	0.93	0.93	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	436	664	117	282	649	642	142	1021	192	444	943	329
RTOR Reduction (vph)	0	11	0	0	0	0	0	12	0	0	26	0
Lane Group Flow (vph)	436	770	0	282	649	642	142	1201	0	444	1246	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	23.0	29.0		18.0	24.0	47.9	10.9	36.9		23.9	49.9	
Effective Green, g (s)	23.0	29.0		18.0	24.0	47.9	10.9	36.9		23.9	49.9	
Actuated g/C Ratio	0.17	0.22		0.14	0.18	0.36	0.08	0.28		0.18	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.2	3.0		3.2	3.0	3.2	3.2	3.2		3.2	3.2	
Lane Grp Cap (vph)	324	800		254	677	604	153	1016		337	1353	
v/s Ratio Prot	c0.23	c0.21		0.15	0.17	0.19	0.08	c0.33		c0.24	0.35	
v/s Ratio Perm						0.19						
v/c Ratio	1.35	0.96		1.11	0.96	1.06	0.93	1.18		1.32	0.92	
Uniform Delay, d1	54.5	51.0		57.0	53.5	42.0	60.2	47.5		54.0	39.2	
Progression Factor	0.89	0.90		1.25	0.88	0.75	1.17	0.85		0.81	0.70	
Incremental Delay, d2	173.7	23.0		87.0	24.5	53.0	47.2	91.1		156.9	7.8	
Delay (s)	222.4	69.0		158.2	71.5	84.5	117.5	131.6		200.5	35.3	
Level of Service	F	E		F	E	F	F	F		F	D	
Approach Delay (s)		123.9			92.4			130.2			78.0	
Approach LOS		F			F			F			E	

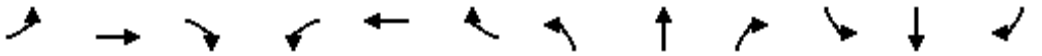
Intersection Summary			
HCM 2000 Control Delay	103.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	898	60	46	953	174	96	41	73	192	39	105
Future Volume (vph)	102	898	60	46	953	174	96	41	73	192	39	105
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	3685		1863	3639		1863	1961	1649	1854	1961	1667
Flt Permitted	0.15	1.00		0.22	1.00		0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	303	3685		439	3639		1423	1961	1649	1417	1961	1667
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	107	945	63	51	1047	191	109	47	83	237	48	130
RTOR Reduction (vph)	0	3	0	0	10	0	0	0	74	0	0	117
Lane Group Flow (vph)	107	1005	0	51	1228	0	109	47	9	237	48	13
Confl. Peds. (#/hr)			1	1					4	4		
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		3	8	5	7	4	1
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	83.8	77.7		83.8	77.7		23.8	7.5	13.6	23.8	7.5	13.6
Effective Green, g (s)	83.8	77.7		83.8	77.7		23.8	7.5	13.6	23.8	7.5	13.6
Actuated g/C Ratio	0.63	0.59		0.63	0.59		0.18	0.06	0.10	0.18	0.06	0.10
Clearance Time (s)	6.2	6.2		6.2	6.2		6.0	6.0	6.2	6.0	6.0	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	264	2169		344	2142		310	111	247	309	111	250
v/s Ratio Prot	c0.02	0.27		0.01	c0.34		0.04	0.02	0.00	c0.09	0.02	0.00
v/s Ratio Perm	0.24			0.09			0.02		0.00	c0.04		0.01
v/c Ratio	0.41	0.46		0.15	0.57		0.35	0.42	0.03	0.77	0.43	0.05
Uniform Delay, d1	26.5	15.4		17.4	16.9		47.5	60.2	53.3	50.2	60.2	53.4
Progression Factor	1.18	1.74		0.35	0.53		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		0.2	1.0		0.7	2.6	0.1	10.8	2.7	0.1
Delay (s)	31.5	26.9		6.3	9.9		48.2	62.8	53.3	61.1	62.9	53.5
Level of Service	C	C		A	A		D	E	D	E	E	D
Approach Delay (s)		27.3			9.8			52.9			58.9	
Approach LOS		C			A			D			E	

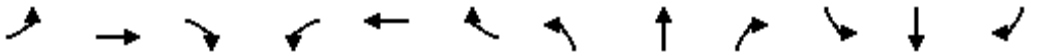
Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.4
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	126	778	679	153	41	715	945	513	24	1235	78
Future Volume (vph)	118	126	778	679	153	41	715	945	513	24	1235	78
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	1961	2933	3614	1889		3614	5353	1667	1863	5353	1642
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	134	828	746	168	45	753	995	540	25	1300	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	281	0	0	60
Lane Group Flow (vph)	126	134	828	746	213	0	753	995	259	25	1300	22
Confl. Peds. (#/hr)						2						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	pt+ov	Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8	8 5	4	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	12.0	12.0	49.1	28.0	28.0		31.1	63.2	63.2	4.0	36.1	36.1
Effective Green, g (s)	12.0	12.0	49.1	28.0	28.0		31.1	63.2	63.2	4.0	36.1	36.1
Actuated g/C Ratio	0.09	0.09	0.37	0.21	0.21		0.24	0.48	0.48	0.03	0.27	0.27
Clearance Time (s)	6.0	6.0		6.0	6.0		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	3.0	3.0		3.5	3.5		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	178	1090	766	400		851	2562	798	56	1463	449
v/s Ratio Prot	0.07	0.07	c0.28	c0.21	0.11		c0.21	0.19		0.01	c0.24	
v/s Ratio Perm									0.16			0.01
v/c Ratio	0.75	0.75	0.76	0.97	0.53		0.88	0.39	0.32	0.45	0.89	0.05
Uniform Delay, d1	58.5	58.6	36.3	51.6	46.2		48.7	22.0	21.2	62.9	46.0	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.86	0.73	0.29	1.00	1.00	1.00
Incremental Delay, d2	16.3	16.4	3.1	26.1	1.5		6.9	0.3	0.6	5.6	8.4	0.2
Delay (s)	74.8	74.9	39.4	77.7	47.7		48.8	16.2	6.8	68.5	54.4	35.5
Level of Service	E	E	D	E	D		D	B	A	E	D	D
Approach Delay (s)		47.9			71.1			24.7			53.6	
Approach LOS		D			E			C			D	

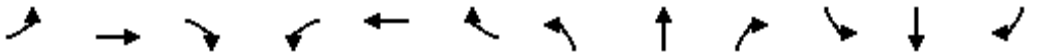
Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	585	229	54	718	102	304	203	44	88	231	134
Future Volume (vph)	127	585	229	54	718	102	304	203	44	88	231	134
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1862	1961	1667	1863	3644		3614	1961	1667	1863	1961	1667
Flt Permitted	0.20	1.00	1.00	0.20	1.00		0.95	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	400	1961	1667	390	3644		3614	1961	1667	1176	1961	1667
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.88	0.88	0.88
Adj. Flow (vph)	140	643	252	59	789	112	323	216	47	100	262	152
RTOR Reduction (vph)	0	0	103	0	8	0	0	0	34	0	0	61
Lane Group Flow (vph)	140	643	149	59	893	0	323	216	13	100	263	91
Confl. Peds. (#/hr)	2					2						
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	1	6	3	5	2		3	8	5	7	4	1
Permitted Phases	6		6	2					8	4		4
Actuated Green, G (s)	69.1	60.9	78.2	65.1	58.9		17.3	29.7	35.9	32.8	22.6	30.8
Effective Green, g (s)	69.1	60.9	78.2	65.1	58.9		17.3	29.7	35.9	32.8	22.6	30.8
Actuated g/C Ratio	0.52	0.46	0.59	0.49	0.45		0.13	0.22	0.27	0.25	0.17	0.23
Clearance Time (s)	6.5	6.5	6.0	6.5	6.5		6.0	6.0	6.5	6.0	6.0	6.5
Vehicle Extension (s)	3.0	3.5	3.0	3.0	3.5		3.0	3.5	3.0	3.0	3.5	3.0
Lane Grp Cap (vph)	300	904	987	261	1625		473	441	453	345	335	388
v/s Ratio Prot	c0.03	c0.33	0.02	0.01	0.25		c0.09	0.11	0.00	0.02	c0.13	0.01
v/s Ratio Perm	0.22		0.07	0.10					0.01	0.05		0.04
v/c Ratio	0.47	0.71	0.15	0.23	0.55		0.68	0.49	0.03	0.29	0.79	0.24
Uniform Delay, d1	18.5	28.5	12.0	21.4	26.8		54.7	44.6	35.3	39.4	52.4	41.1
Progression Factor	0.66	0.86	2.29	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	4.3	0.1	0.4	1.3		4.0	1.0	0.0	0.5	11.8	0.3
Delay (s)	13.3	28.7	27.7	21.9	28.2		58.8	45.6	35.3	39.9	64.1	41.4
Level of Service	B	C	C	C	C		E	D	D	D	E	D
Approach Delay (s)		26.3			27.8			52.0			52.7	
Approach LOS		C			C			D			D	

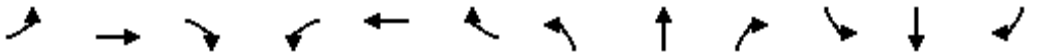
Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	28	107	79	9	620	90	1731	93	654	1466	249
Future Volume (vph)	241	28	107	79	9	620	90	1731	93	654	1466	249
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Lane Util. Factor	0.91	0.91	1.00		1.00	0.88	1.00	0.91		0.97	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1695	3430	1667		1877	2933	1863	5312		3614	3725	1667
Flt Permitted	0.95	0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1695	3430	1667		1877	2933	1863	5312		3614	3725	1667
Peak-hour factor, PHF	0.83	0.83	0.83	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	290	34	129	84	10	660	95	1822	98	688	1543	262
RTOR Reduction (vph)	0	0	105	0	0	91	0	4	0	0	0	88
Lane Group Flow (vph)	145	179	24	0	94	569	95	1916	0	688	1543	174
Turn Type	Split	NA	pm+ov	Split	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	8	8	5	4	4	1	5	2		1	6	8
Permitted Phases			8			4						6
Actuated Green, G (s)	14.6	14.6	24.6		9.7	40.4	10.0	52.2		30.7	72.9	87.5
Effective Green, g (s)	14.6	14.6	24.6		9.7	40.4	10.0	52.2		30.7	72.9	87.5
Actuated g/C Ratio	0.11	0.11	0.19		0.07	0.31	0.08	0.40		0.23	0.55	0.66
Clearance Time (s)	6.0	6.0	6.4		6.0	6.4	6.4	6.4		6.4	6.4	6.0
Vehicle Extension (s)	3.0	3.0	3.0		4.0	3.5	3.0	3.0		3.5	3.0	3.0
Lane Grp Cap (vph)	187	379	310		137	1039	141	2100		840	2057	1105
v/s Ratio Prot	c0.09	0.05	0.01		0.05	c0.13	0.05	c0.36		c0.19	0.41	0.02
v/s Ratio Perm			0.01			0.07						0.09
v/c Ratio	0.78	0.47	0.08		0.69	0.55	0.67	0.91		0.82	0.75	0.16
Uniform Delay, d1	57.1	55.1	44.3		59.7	38.2	59.4	37.7		48.0	22.6	8.4
Progression Factor	1.05	1.05	1.03		1.00	1.00	0.90	0.98		0.96	0.90	1.60
Incremental Delay, d2	18.0	0.9	0.1		14.4	0.7	1.2	0.8		2.7	1.0	0.0
Delay (s)	78.2	58.9	45.7		74.1	38.8	54.4	37.9		48.7	21.4	13.4
Level of Service	E	E	D		E	D	D	D		D	C	B
Approach Delay (s)		61.3			43.2			38.7			28.1	
Approach LOS		E			D			D			C	

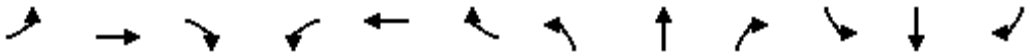
Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



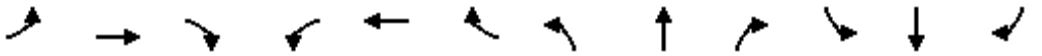
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	65	88	5	103	69	1152	130	130	1048	59
Future Volume (vph)	84	3	65	88	5	103	69	1152	130	130	1048	59
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1679		1863	1961	1643	1863	3669		1863	3696	
Flt Permitted	0.75	1.00		0.69	1.00	1.00	0.20	1.00		0.15	1.00	
Satd. Flow (perm)	1474	1679		1352	1961	1643	395	3669		286	3696	
Peak-hour factor, PHF	0.74	0.74	0.74	0.72	0.72	0.72	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	114	4	88	122	7	143	74	1239	140	137	1103	62
RTOR Reduction (vph)	0	77	0	0	0	124	0	5	0	0	2	0
Lane Group Flow (vph)	114	15	0	122	7	19	74	1374	0	137	1163	0
Confl. Peds. (#/hr)	1					1						
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4		4	2			6		
Actuated Green, G (s)	17.1	17.1		17.1	17.1	17.1	94.6	88.7		99.2	91.0	
Effective Green, g (s)	17.1	17.1		17.1	17.1	17.1	94.6	88.7		99.2	91.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13	0.13	0.72	0.67		0.75	0.69	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	217		175	254	212	348	2465		312	2548	
v/s Ratio Prot		0.01			0.00		0.01	c0.37		c0.03	0.31	
v/s Ratio Perm	0.08			c0.09		0.01	0.14			0.30		
v/c Ratio	0.60	0.07		0.70	0.03	0.09	0.21	0.56		0.44	0.46	
Uniform Delay, d1	54.2	50.5		55.0	50.2	50.6	12.4	11.4		18.5	9.3	
Progression Factor	1.00	0.99		1.00	1.00	1.00	1.00	1.00		0.53	0.24	
Incremental Delay, d2	5.0	0.1		11.4	0.0	0.2	0.3	0.9		0.3	0.2	
Delay (s)	59.5	49.9		66.4	50.2	50.8	12.7	12.3		10.1	2.4	
Level of Service	E	D		E	D	D	B	B		B	A	
Approach Delay (s)		55.2			57.8			12.3			3.3	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	65	0	0	1	62	1273	1	7	1146	55
Future Volume (vph)	44	0	65	0	0	1	62	1273	1	7	1146	55
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.86		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	1667			1696		1863	3725		1862	3700	
Flt Permitted	0.76	1.00			1.00		0.21	1.00		0.18	1.00	
Satd. Flow (perm)	1483	1667			1696		404	3725		356	3700	
Peak-hour factor, PHF	0.90	0.90	0.90	0.60	0.60	0.60	0.93	0.93	0.93	0.95	0.95	0.95
Adj. Flow (vph)	49	0	72	0	0	2	67	1369	1	7	1206	58
RTOR Reduction (vph)	0	67	0	0	2	0	0	0	0	0	2	0
Lane Group Flow (vph)	49	5	0	0	0	0	67	1370	0	7	1262	0
Confl. Peds. (#/hr)									1	1		
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Effective Green, g (s)	7.9	7.9			7.9		89.3	89.3		89.3	89.3	
Actuated g/C Ratio	0.07	0.07			0.07		0.82	0.82		0.82	0.82	
Clearance Time (s)	6.0	6.0			6.0		5.8	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	107	120			122		330	3051		291	3031	
v/s Ratio Prot		0.00			0.00			c0.37			0.34	
v/s Ratio Perm	c0.03						0.17			0.02		
v/c Ratio	0.46	0.04			0.00		0.20	0.45		0.02	0.42	
Uniform Delay, d1	48.5	47.0			46.9		2.1	2.8		1.8	2.7	
Progression Factor	1.00	1.00			1.00		0.26	0.23		1.00	1.00	
Incremental Delay, d2	3.1	0.1			0.0		1.2	0.4		0.2	0.4	
Delay (s)	51.6	47.2			46.9		1.8	1.1		2.0	3.1	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		49.0			46.9			1.1			3.1	
Approach LOS		D			D			A			A	

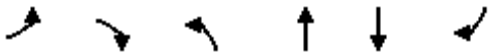
Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	11.8
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	814	179	1035	0	1671	0	0	2005	491
Future Volume (vph)	0	0	0	814	179	1035	0	1671	0	0	2005	491
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)				6.0	6.0	6.3		6.3			6.3	6.3
Lane Util. Factor				0.97	1.00	0.88		0.91			0.91	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				3614	1961	2933		5353			5353	1667
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				3614	1961	2933		5353			5353	1667
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	925	203	1176	0	1759	0	0	2203	540
RTOR Reduction (vph)	0	0	0	0	0	15	0	0	0	0	0	167
Lane Group Flow (vph)	0	0	0	925	203	1161	0	1759	0	0	2203	373
Turn Type				Split	NA	custom		NA			NA	Prot
Protected Phases				4	4	1 4		2			6	6
Permitted Phases												
Actuated Green, G (s)				38.8	38.8	58.8		60.9			80.9	80.9
Effective Green, g (s)				38.8	38.8	58.8		60.9			80.9	80.9
Actuated g/C Ratio				0.29	0.29	0.45		0.46			0.61	0.61
Clearance Time (s)				6.0	6.0			6.3			6.3	6.3
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				1062	576	1306		2469			3280	1021
v/s Ratio Prot				0.26	0.10	c0.40		0.33			c0.41	0.22
v/s Ratio Perm												
v/c Ratio				0.87	0.35	0.89		0.71			0.67	0.37
Uniform Delay, d1				44.2	36.7	33.6		28.5			16.8	12.7
Progression Factor				1.00	1.00	1.00		0.88			1.06	1.82
Incremental Delay, d2				8.0	0.4	7.7		1.1			0.5	0.5
Delay (s)				52.2	37.1	41.3		26.1			18.4	23.6
Level of Service				D	D	D		C			B	C
Approach Delay (s)		0.0			45.3			26.1			19.4	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	480	483	0	1770	2200	0
Future Volume (vph)	480	483	0	1770	2200	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.96	0.85		1.00	1.00	
Flt Protected	0.96	1.00		1.00	1.00	
Satd. Flow (prot)	3521	1517		3725	3725	
Flt Permitted	0.96	1.00		1.00	1.00	
Satd. Flow (perm)	3521	1517		3725	3725	
Peak-hour factor, PHF	0.95	0.95	0.94	0.94	0.94	0.94
Adj. Flow (vph)	505	508	0	1883	2340	0
RTOR Reduction (vph)	6	6	0	0	0	0
Lane Group Flow (vph)	687	314	0	1883	2340	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases						
Actuated Green, G (s)	31.2	31.2		88.8	88.8	
Effective Green, g (s)	31.2	31.2		88.8	88.8	
Actuated g/C Ratio	0.24	0.24		0.67	0.67	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.5	3.5		3.0	3.0	
Lane Grp Cap (vph)	832	358		2505	2505	
v/s Ratio Prot	0.20	c0.21		0.51	c0.63	
v/s Ratio Perm						
v/c Ratio	0.83	0.88		0.75	0.93	
Uniform Delay, d1	47.8	48.5		14.3	19.0	
Progression Factor	1.00	1.00		0.51	0.96	
Incremental Delay, d2	6.9	21.1		1.3	5.7	
Delay (s)	54.7	69.6		8.6	23.9	
Level of Service	D	E		A	C	
Approach Delay (s)	59.4			8.6	23.9	
Approach LOS	E			A	C	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1035	12	15	1017	17	7
Future Volume (Veh/h)	1035	12	15	1017	17	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.87	0.87	0.82	0.82
Hourly flow rate (vph)	1137	13	17	1169	21	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	370			619		
pX, platoon unblocked			0.87		0.89	0.87
vC, conflicting volume			1150		1762	575
vC1, stage 1 conf vol					1144	
vC2, stage 2 conf vol					618	
vCu, unblocked vol			876		967	216
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		93	99
cM capacity (veh/h)			668		312	687

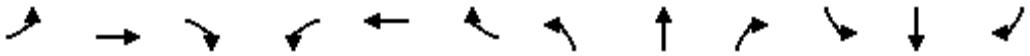
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	758	392	17	584	584	30
Volume Left	0	0	17	0	0	21
Volume Right	0	13	0	0	0	9
cSH	1700	1700	668	1700	1700	373
Volume to Capacity	0.45	0.23	0.03	0.34	0.34	0.08
Queue Length 95th (ft)	0	0	2	0	0	7
Control Delay (s)	0.0	0.0	10.5	0.0	0.0	15.5
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			15.5
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1030	13	8	1289	12	11
Future Volume (Veh/h)	1030	13	8	1289	12	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.63	0.63
Hourly flow rate (vph)	1084	14	8	1357	19	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	1059			710		
pX, platoon unblocked			0.83		0.88	0.83
vC, conflicting volume			1098		1786	549
vC1, stage 1 conf vol					1091	
vC2, stage 2 conf vol					694	
vCu, unblocked vol			714		762	54
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	98
cM capacity (veh/h)			734		364	834

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	723	375	8	678	678	36
Volume Left	0	0	8	0	0	19
Volume Right	0	14	0	0	0	17
cSH	1700	1700	734	1700	1700	496
Volume to Capacity	0.43	0.22	0.01	0.40	0.40	0.07
Queue Length 95th (ft)	0	0	1	0	0	6
Control Delay (s)	0.0	0.0	10.0	0.0	0.0	12.8
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			12.8
Approach LOS						B

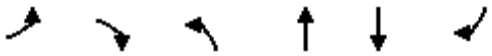
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	96	189	40	88	45	161	92	42	47	103	24
Future Volume (vph)	9	96	189	40	88	45	161	92	42	47	103	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.67	0.67	0.67
Hourly flow rate (vph)	9	101	199	42	93	47	187	107	49	70	154	36

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	9	300	42	140	187	156	70	190
Volume Left (vph)	9	0	42	0	187	0	70	0
Volume Right (vph)	0	199	0	47	0	49	0	36
Hadj (s)	0.53	-0.43	0.53	-0.20	0.53	-0.19	0.53	-0.10
Departure Headway (s)	7.0	6.1	7.2	6.5	6.9	6.2	7.0	6.4
Degree Utilization, x	0.02	0.51	0.08	0.25	0.36	0.27	0.14	0.34
Capacity (veh/h)	481	566	463	516	488	551	481	531
Control Delay (s)	9.0	13.9	9.7	10.5	12.5	10.2	9.9	11.4
Approach Delay (s)	13.8		10.3		11.4		11.0	
Approach LOS	B		B		B		B	

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	47.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	164	38	24	27	23	103
Future Volume (vph)	164	38	24	27	23	103
Peak Hour Factor	0.77	0.77	0.82	0.82	0.77	0.77
Hourly flow rate (vph)	213	49	29	33	30	134

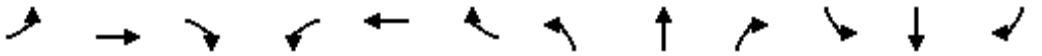
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total (vph)	213	49	29	33	164
Volume Left (vph)	213	0	29	0	0
Volume Right (vph)	0	49	0	0	134
Hadj (s)	0.53	-0.67	0.53	0.03	-0.46
Departure Headway (s)	5.6	4.4	5.9	5.4	4.6
Degree Utilization, x	0.33	0.06	0.05	0.05	0.21
Capacity (veh/h)	618	783	575	625	732
Control Delay (s)	10.1	6.5	8.0	7.5	8.9
Approach Delay (s)	9.4		7.8		8.9
Approach LOS	A		A		A

Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	15	1330	24	12	1177
Future Volume (Veh/h)	25	15	1330	24	12	1177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.60	0.60	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	42	25	1462	26	13	1239
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						708
pX, platoon unblocked	0.86					
vC, conflicting volume	2122	745			1489	
vC1, stage 1 conf vol	1476					
vC2, stage 2 conf vol	646					
vCu, unblocked vol	1977	745			1489	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	93			97	
cM capacity (veh/h)	167	356			447	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	42	25	975	513	13	620	620
Volume Left	42	0	0	0	13	0	0
Volume Right	0	25	0	26	0	0	0
cSH	167	356	1700	1700	447	1700	1700
Volume to Capacity	0.25	0.07	0.57	0.30	0.03	0.36	0.36
Queue Length 95th (ft)	24	6	0	0	2	0	0
Control Delay (s)	33.7	15.9	0.0	0.0	13.3	0.0	0.0
Lane LOS	D	C			B		
Approach Delay (s)	27.0		0.0		0.1		
Approach LOS	D						

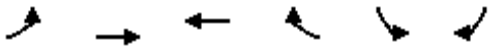
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	965	21	12	962	60	18	11	12	70	11	78
Future Volume (vph)	50	965	21	12	962	60	18	11	12	70	11	78
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1863	3713		1863	3693		1863	1808		1863	1702	
Flt Permitted	0.21	1.00		0.20	1.00		0.48	1.00		0.74	1.00	
Satd. Flow (perm)	417	3713		390	3693		943	1808		1453	1702	
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.92	0.92	0.92	0.60	0.60	0.60
Adj. Flow (vph)	61	1177	26	13	1069	67	20	12	13	117	18	130
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	114	0
Lane Group Flow (vph)	61	1202	0	13	1134	0	20	14	0	117	34	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	102.7	95.7		93.3	91.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	102.7	95.7		93.3	91.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.78	0.73		0.71	0.69		0.12	0.12		0.12	0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	401	2691		301	2545		114	219		176	206	
v/s Ratio Prot	c0.01	c0.32		0.00	0.31			0.01			0.02	
v/s Ratio Perm	0.11			0.03			0.02			c0.08		
v/c Ratio	0.15	0.45		0.04	0.45		0.18	0.06		0.66	0.16	
Uniform Delay, d1	8.3	7.4		10.7	9.2		52.1	51.4		55.4	52.0	
Progression Factor	1.00	1.00		0.97	1.02		1.04	1.05		0.94	0.88	
Incremental Delay, d2	0.2	0.5		0.0	0.3		0.7	0.1		9.0	0.4	
Delay (s)	8.4	7.9		10.4	9.7		54.9	54.1		61.1	46.3	
Level of Service	A	A		B	A		D	D		E	D	
Approach Delay (s)		7.9			9.7			54.5			52.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	44	41	24	27	0
Future Volume (Veh/h)	0	44	41	24	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	48	45	26	29	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		550	1165			
pX, platoon unblocked						
vC, conflicting volume	71				106	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71				106	58
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1529				892	1008

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	48	71	29
Volume Left	0	0	29
Volume Right	0	26	0
cSH	1529	1700	892
Volume to Capacity	0.00	0.04	0.03
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	46	25	41	40	25	40
Future Volume (Veh/h)	46	25	41	40	25	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	27	45	43	27	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	750			965		
pX, platoon unblocked						
vC, conflicting volume			77		196	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		196	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	96
cM capacity (veh/h)			1522		769	1001

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	77	88	70
Volume Left	0	45	27
Volume Right	27	0	43
cSH	1700	1522	897
Volume to Capacity	0.05	0.03	0.08
Queue Length 95th (ft)	0	2	6
Control Delay (s)	0.0	3.9	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.9	9.4
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	138	9	14	119	9	14
Future Volume (Veh/h)	138	9	14	119	9	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	10	15	129	10	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				200		
pX, platoon unblocked					1.00	
vC, conflicting volume			160		314	155
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			160		310	155
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1419		673	891

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	160	144	25
Volume Left	0	15	10
Volume Right	10	0	15
cSH	1700	1419	789
Volume to Capacity	0.09	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.9	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	12	1902	16	13	1639
Future Volume (Veh/h)	15	12	1902	16	13	1639
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	13	2002	17	14	1725
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)			587			395
pX, platoon unblocked	0.79	0.76			0.76	
vC, conflicting volume	2901	676			2019	
vC1, stage 1 conf vol	2010					
vC2, stage 2 conf vol	890					
vCu, unblocked vol	1044	0			1225	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			97	
cM capacity (veh/h)	180	822			428	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	29	801	801	417	14	862	862
Volume Left	16	0	0	0	14	0	0
Volume Right	13	0	0	17	0	0	0
cSH	277	1700	1700	1700	428	1700	1700
Volume to Capacity	0.10	0.47	0.47	0.25	0.03	0.51	0.51
Queue Length 95th (ft)	9	0	0	0	3	0	0
Control Delay (s)	19.5	0.0	0.0	0.0	13.7	0.0	0.0
Lane LOS	C				B		
Approach Delay (s)	19.5	0.0			0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	983	77	20	1136	77	20
Future Volume (Veh/h)	983	77	20	1136	77	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	1080	85	22	1248	84	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				1105		
pX, platoon unblocked					0.83	
vC, conflicting volume			1165		1748	540
vC1, stage 1 conf vol					1080	
vC2, stage 2 conf vol					668	
vCu, unblocked vol			1165		1492	540
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		68	95
cM capacity (veh/h)			595		265	486

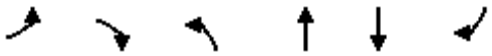
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	540	540	85	22	624	624	106
Volume Left	0	0	0	22	0	0	84
Volume Right	0	0	85	0	0	0	22
cSH	1700	1700	1700	595	1700	1700	334
Volume to Capacity	0.32	0.32	0.05	0.04	0.37	0.37	0.32
Queue Length 95th (ft)	0	0	0	3	0	0	33
Control Delay (s)	0.0	0.0	0.0	11.3	0.0	0.0	22.3
Lane LOS				B			C
Approach Delay (s)	0.0			0.2			22.3
Approach LOS							C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	936	67	0	1156	0	5
Future Volume (Veh/h)	936	67	0	1156	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	1029	74	0	1270	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)				300		
pX, platoon unblocked					0.82	
vC, conflicting volume			1103		1701	552
vC1, stage 1 conf vol					1066	
vC2, stage 2 conf vol					635	
vCu, unblocked vol			1103		1419	552
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			629		273	478

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	686	417	635	635	5
Volume Left	0	0	0	0	0
Volume Right	0	74	0	0	5
cSH	1700	1700	1700	1700	478
Volume to Capacity	0.40	0.25	0.37	0.37	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	12.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.6
Approach LOS					B

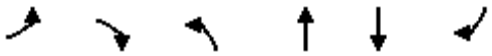
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	34	34	472	497	17
Future Volume (Veh/h)	79	34	34	472	497	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.88	0.88
Hourly flow rate (vph)	86	37	36	502	565	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					400	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1148	574	584			
vC1, stage 1 conf vol	574					
vC2, stage 2 conf vol	574					
vCu, unblocked vol	1092	427	438			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	93	96			
cM capacity (veh/h)	425	541	968			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	86	37	36	502	584
Volume Left	86	0	36	0	0
Volume Right	0	37	0	0	19
cSH	425	541	968	1700	1700
Volume to Capacity	0.20	0.07	0.04	0.30	0.34
Queue Length 95th (ft)	19	5	3	0	0
Control Delay (s)	15.6	12.1	8.9	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	14.6		0.6		0.0
Approach LOS	B				

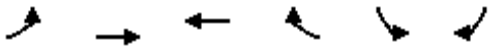
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	12	12	1298	1173	38
Future Volume (Veh/h)	38	12	12	1298	1173	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	41	13	13	1396	1235	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					285	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1979	638	1275			
vC1, stage 1 conf vol	1255					
vC2, stage 2 conf vol	724					
vCu, unblocked vol	1869	384	1090			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	98	98			
cM capacity (veh/h)	224	555	574			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	41	13	13	698	698	823	452
Volume Left	41	0	13	0	0	0	0
Volume Right	0	13	0	0	0	0	40
cSH	224	555	574	1700	1700	1700	1700
Volume to Capacity	0.18	0.02	0.02	0.41	0.41	0.48	0.27
Queue Length 95th (ft)	16	2	2	0	0	0	0
Control Delay (s)	24.7	11.6	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	21.5		0.1			0.0	
Approach LOS	C						

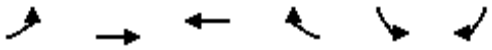
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	243	204	144	133	83
Future Volume (Veh/h)	86	243	204	144	133	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.83	0.83	0.94	0.94	0.92	0.92
Hourly flow rate (vph)	104	293	217	153	145	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		853	483			
pX, platoon unblocked						
vC, conflicting volume	370				648	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370				648	185
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				61	89
cM capacity (veh/h)	1185				368	826

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	104	146	146	145	225	145	90
Volume Left	104	0	0	0	0	145	0
Volume Right	0	0	0	0	153	0	90
cSH	1185	1700	1700	1700	1700	368	826
Volume to Capacity	0.09	0.09	0.09	0.09	0.13	0.39	0.11
Queue Length 95th (ft)	7	0	0	0	0	46	9
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	21.0	9.9
Lane LOS	A					C	A
Approach Delay (s)	2.2			0.0		16.8	
Approach LOS						C	

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	63	1100	1105	44	29	68
Future Volume (Veh/h)	63	1100	1105	44	29	68
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.91	0.91	0.92	0.92
Hourly flow rate (vph)	66	1158	1214	48	32	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		480				
pX, platoon unblocked					0.85	
vC, conflicting volume	1262				1949	631
vC1, stage 1 conf vol					1238	
vC2, stage 2 conf vol					711	
vCu, unblocked vol	1262				1764	631
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	88				85	83
cM capacity (veh/h)	547				215	424

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	66	579	579	809	453	32	74
Volume Left	66	0	0	0	0	32	0
Volume Right	0	0	0	0	48	0	74
cSH	547	1700	1700	1700	1700	215	424
Volume to Capacity	0.12	0.34	0.34	0.48	0.27	0.15	0.17
Queue Length 95th (ft)	10	0	0	0	0	13	16
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	24.7	15.3
Lane LOS	B					C	C
Approach Delay (s)	0.7			0.0		18.1	
Approach LOS						C	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	9	286	34	9	323
Future Volume (Veh/h)	50	9	286	34	9	323
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.86	0.86	0.67	0.67
Hourly flow rate (vph)	54	10	333	40	13	482
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			386			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	861	353			373	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844	323			343	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	99			99	
cM capacity (veh/h)	321	700			1185	

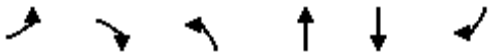
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	54	10	373	13	482
Volume Left	54	0	0	13	0
Volume Right	0	10	40	0	0
cSH	321	700	1700	1185	1700
Volume to Capacity	0.17	0.01	0.22	0.01	0.28
Queue Length 95th (ft)	15	1	0	1	0
Control Delay (s)	18.5	10.2	0.0	8.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	17.2		0.0	0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	168	17	3	165	8	2
Future Volume (Veh/h)	168	17	3	165	8	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	177	18	3	174	9	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			195		366	186
vC1, stage 1 conf vol					186	
vC2, stage 2 conf vol					180	
vCu, unblocked vol			195		366	186
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1378		757	856

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	195	3	174	9	2
Volume Left	0	3	0	9	0
Volume Right	18	0	0	0	2
cSH	1700	1378	1700	757	856
Volume to Capacity	0.11	0.00	0.10	0.01	0.00
Queue Length 95th (ft)	0	0	0	1	0
Control Delay (s)	0.0	7.6	0.0	9.8	9.2
Lane LOS		A		A	A
Approach Delay (s)	0.0	0.1		9.7	
Approach LOS				A	

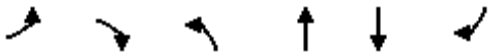
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	15	21	1271	1122	66
Future Volume (Veh/h)	39	15	21	1271	1122	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	42	16	23	1367	1181	69
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				900	1216	
pX, platoon unblocked	0.89	0.91	0.91			
vC, conflicting volume	1945	625	1250			
vC1, stage 1 conf vol	1216					
vC2, stage 2 conf vol	730					
vCu, unblocked vol	1368	399	1083			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	97	96			
cM capacity (veh/h)	255	549	584			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	16	23	684	684	787	463
Volume Left	42	0	23	0	0	0	0
Volume Right	0	16	0	0	0	0	69
cSH	255	549	584	1700	1700	1700	1700
Volume to Capacity	0.16	0.03	0.04	0.40	0.40	0.46	0.27
Queue Length 95th (ft)	14	2	3	0	0	0	0
Control Delay (s)	21.9	11.8	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	19.1		0.2			0.0	
Approach LOS	C						

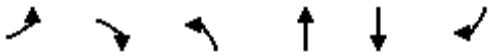
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	3	0	1310	1185	0
Future Volume (Veh/h)	0	3	0	1310	1185	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.95	0.95
Hourly flow rate (vph)	0	3	0	1409	1247	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)				1150	966	
pX, platoon unblocked	0.89	0.91	0.91			
vC, conflicting volume	1952	624	1247			
vC1, stage 1 conf vol	1247					
vC2, stage 2 conf vol	704					
vCu, unblocked vol	1364	383	1069			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	250	559	588			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	3	704	704	624	624
Volume Left	0	0	0	0	0
Volume Right	3	0	0	0	0
cSH	559	1700	1700	1700	1700
Volume to Capacity	0.01	0.41	0.41	0.37	0.37
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	11.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.5	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	5	116	127	3
Future Volume (Veh/h)	11	32	5	116	127	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60
Hourly flow rate (vph)	18	53	8	193	212	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				527	809	
pX, platoon unblocked						
vC, conflicting volume	327	108	217			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327	108	217			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	94	99			
cM capacity (veh/h)	638	924	1350			

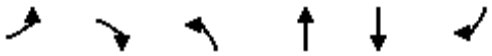
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	53	8	96	96	141	76
Volume Left	18	0	8	0	0	0	0
Volume Right	0	53	0	0	0	0	5
cSH	638	924	1350	1700	1700	1700	1700
Volume to Capacity	0.03	0.06	0.01	0.06	0.06	0.08	0.04
Queue Length 95th (ft)	2	5	0	0	0	0	0
Control Delay (s)	10.8	9.1	7.7	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.6		0.3			0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1671	579	0	2819
Future Volume (Veh/h)	0	0	1671	579	0	2819
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	0	0	1759	609	0	3098
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			853			422
pX, platoon unblocked	0.82	0.68			0.68	
vC, conflicting volume	2792	880			2368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	706	0			2071	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	304	738			181	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	880	880	609	1033	1033	1033
Volume Left	0	0	0	0	0	0
Volume Right	0	0	609	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.52	0.36	0.61	0.61	0.61
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	2250	2200	619
Future Volume (Veh/h)	0	0	0	2250	2200	619
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	0	2394	2340	659
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				362	913	
pX, platoon unblocked	0.79	0.69	0.69			
vC, conflicting volume	3537	1170	2999			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1927	356	2999			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	46	443	78			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1197	1197	1170	1170	659
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	659
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.70	0.70	0.69	0.69	0.39
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1770	965	0	2683
Future Volume (Veh/h)	0	0	1770	965	0	2683
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	0	1883	1027	0	2854
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			476			150
pX, platoon unblocked	0.62	0.66			0.66	
vC, conflicting volume	2834	942			2910	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			2863	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	639	713			84	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	942	942	1027	951	951	951
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1027	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.55	0.55	0.60	0.56	0.56	0.56
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX C. Bond Street and Crescent Boulevard Draft Plans

INDEX OF SHEETS

	SHEET NO.
TITLE	1
TYPICAL SECTIONS	2-4
GENERAL NOTES	5
QUANTITY SHEET	6
LEGEND SHEET	7
REMOVAL, CONSTRUCTION, AND PROFILE	8-20
PERMANENT SIGNING AND PAVEMENT MARKING	21-22
SOIL EROSION DETAILS	23

CITY OF NOVI

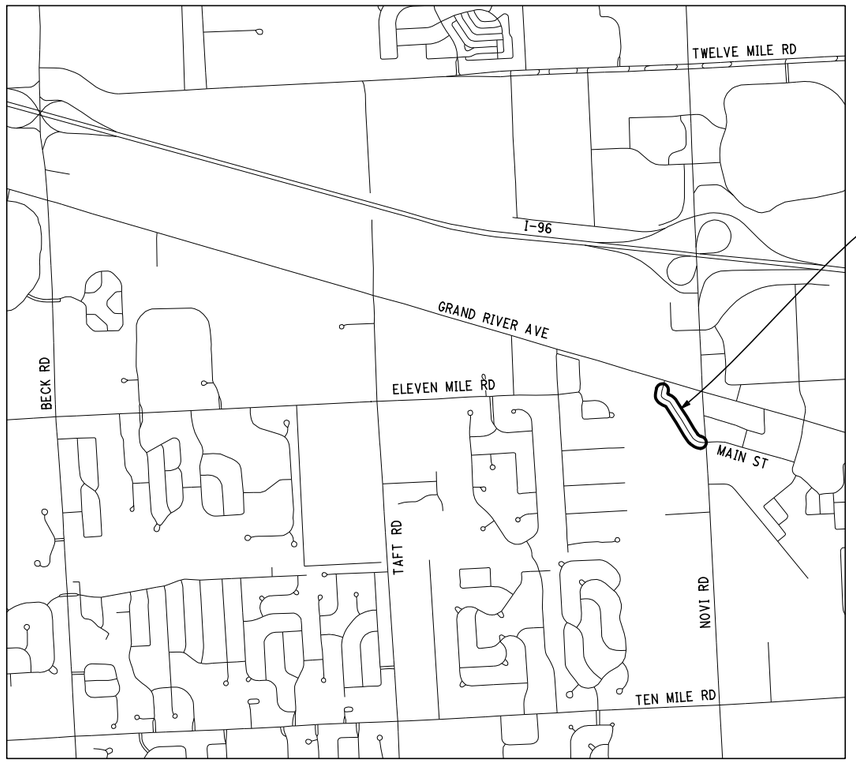
BOND STREET CONSTRUCTION

CITY OF NOVI
OAKLAND COUNTY, MI

30% (BASE) PLANS
OCTOBER 12, 2018

GENERAL NOTES

1) MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CITY OF NOVI STANDARDS AND SPECIFICATIONS AND THE PROJECT MANUAL.
2) THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH THE AASHTO; A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2011.
3) THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.



LOCATION MAP (NTS)

MAYOR

BOB GATT

MAYOR PRO-TEM

DAVID STAUDT

CITY COUNCIL

ANDREW MUTCH
WAYNE WROBEL
LAURA MARIE CASEY
GWEN MARKHAM
KELLY BREEN

ENGINEERING SENIOR MANAGER

GEORGE D. MELISTAS

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ANN ARBOR, MI 48103
734-996-5381
sa3146@att.com

BRIGHTHOUSE NETWORKS — CABLE
ATTN: BOB HENDZELL
31889 INDUSTRIAL ROAD
LIVONIA, MI 48150-1821
734-293-1258
bob.hendzell@mybrighthouse.com

CONSUMER'S ENERGY — NATURAL GAS
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11801 FARMINGTON ROAD
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734-513-6277
christopher.schneider@cmsenergy.com

DTE ENERGY — ELECTRIC
ATTN: SE PLANNING AND DESIGN
ONE ENERGY PLAZA, 570 SB
DETROIT, MI 48226
313-235-5632
SEPD@dteenergy.com

CITY OF NOVI — ROADS & DRAINS
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NOVI, MI 48375
248-735-5640
mwiktorowski@cityofnovi.org

CITY OF NOVI — WATER & SEWER
ATTN: SCOTT ROSELLE
26300 LEE BEGOLE DR
NOVI, MI 48375
248-735-5644
sroselle@cityofnovi.org

CONTRACT FOR:
CONSTRUCTION OF 0.35 MILES OF BOND STREET AND RECONSTRUCTION OF FLINT ST

PREPARED UNDER THE SUPERVISION OF:

Approved _____ PROFESSIONAL ENGINEER _____ Date

AECOM

CALL MISS DIG
3 WORKING DAYS BEFORE YOU DIG
(EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS)
(800) 482-7171 OR 811

FILE: 82577_Bond_title.DGN

AUTH	DATE	REVISION

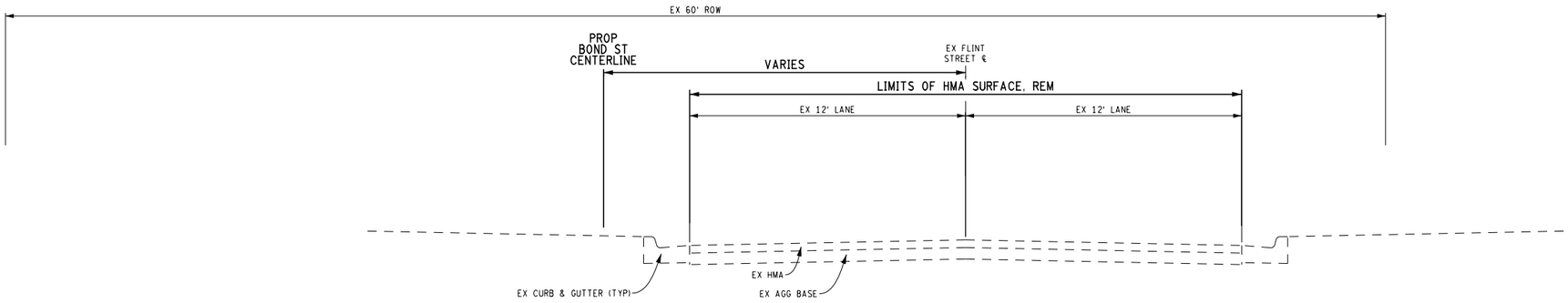
AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

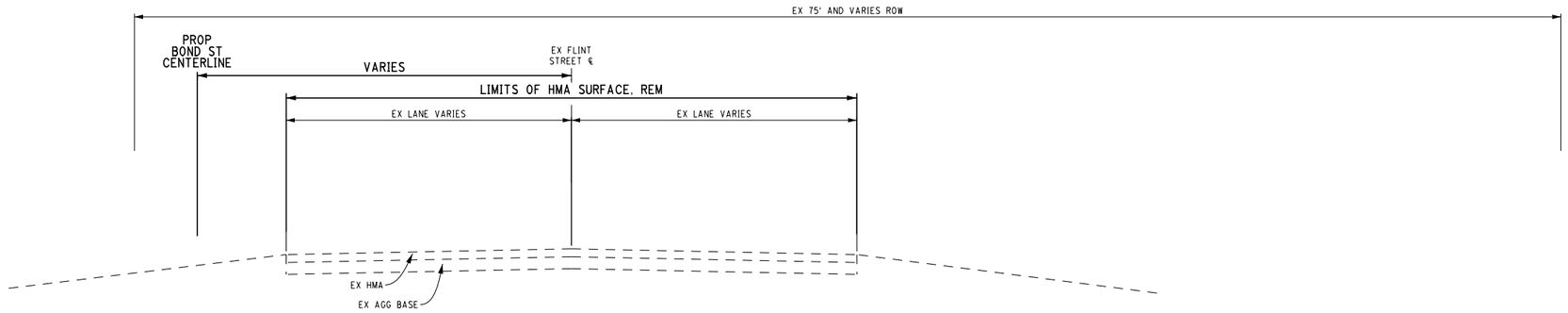
TITLE SHEET

JOB 60582577
DATE 10/12/18
SHEET 1



EXISTING FLINT STREET TYPICAL SECTION

STA 22+13.00 (POB) TO STA 23+98.66



EXISTING FLINT STREET TYPICAL SECTION

STA 23+98.66 TO END OF EX FLINT ST

0 VERT. (FT) 6

0 HORZ. (FT) 6

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AUTH	DATE	REVISION

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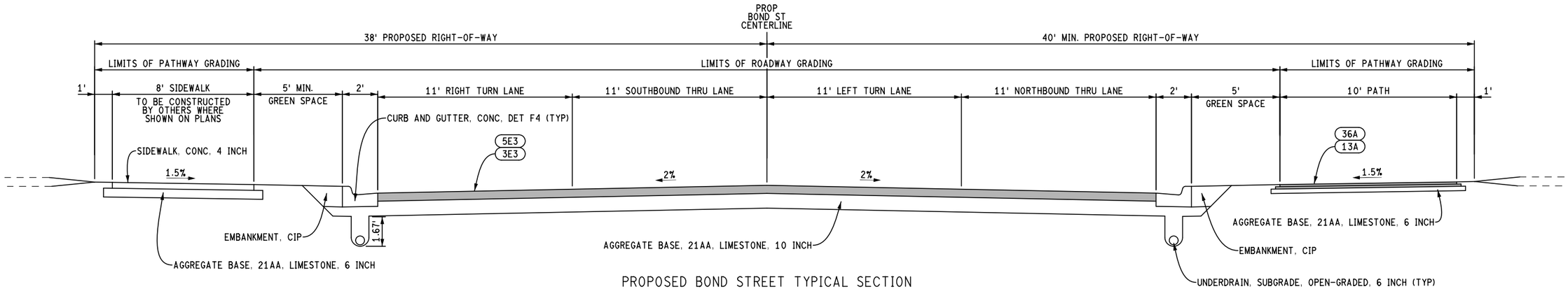
CITY OF NOVI

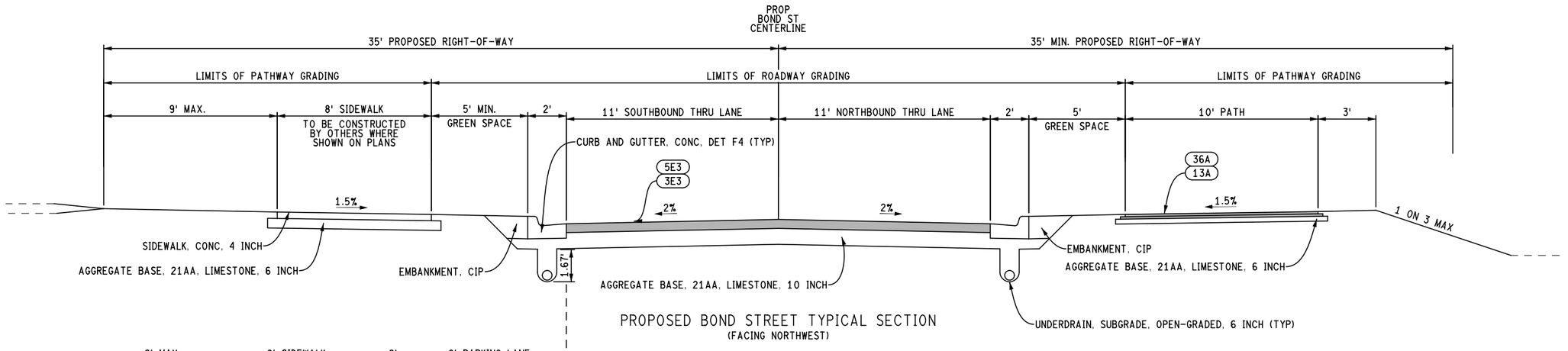
BOND ST CONSTRUCTION

EXISTING TYPICAL SECTIONS

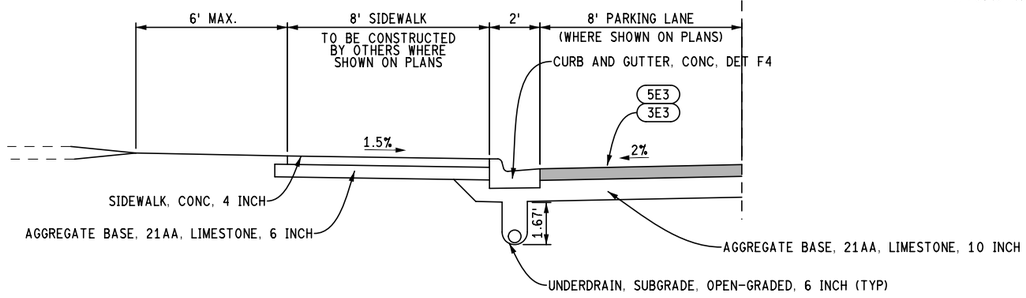
JOB
60582577
DATE
10/12/18
SHEET
2



PROPOSED BOND STREET TYPICAL SECTION
(AT NOVI ROAD INTERSECTION, FACING NORTHWEST)



PROPOSED BOND STREET TYPICAL SECTION
(FACING NORTHWEST)



PROPOSED BOND STREET HALF TYPICAL SECTION
WHERE ON-STREET PARKING IS PROVIDED
(AS SHOWN ON PLANS)

HMA APPLICATION ESTIMATE

IDENT NO.	ITEM	RATE PER SYD	PERFORMANCE GRADE	REMARKS
5E3	HMA, 5E3	220 lb	64-28	(2 INCHES) TOP COURSE (AWI=260)
3E3	HMA, 3E3	550 lb	64-22	(5 INCHES) LEVELING AND BASE COURSE
36A	HMA, BIKE PATH	220 lb	64-22	(2 INCHES) BIKE PATH TOP COURSE
13A	HMA, BIKE PATH	220 lb	64-22	(2 INCHES) BIKE PATH LEVELING AND BASE COURSE
APP	HMA APPROACH (DRIVEWAYS)	770 lb	64-22	(2 INCHES HMA, 5E3) TOP COURSE (5 INCHES HMA, 3E3) LEVELING AND BASE COURSE
	*BOND COAT	0-0.10 GAL		

*FOR INFORMATION ONLY

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CITY OF NOVI

BOND ST CONSTRUCTION

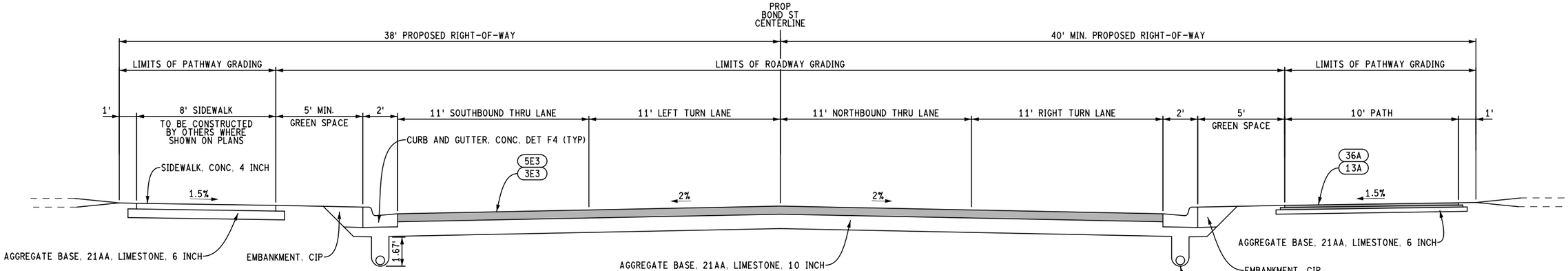
PROPOSED TYPICAL SECTIONS

JOB
60582577

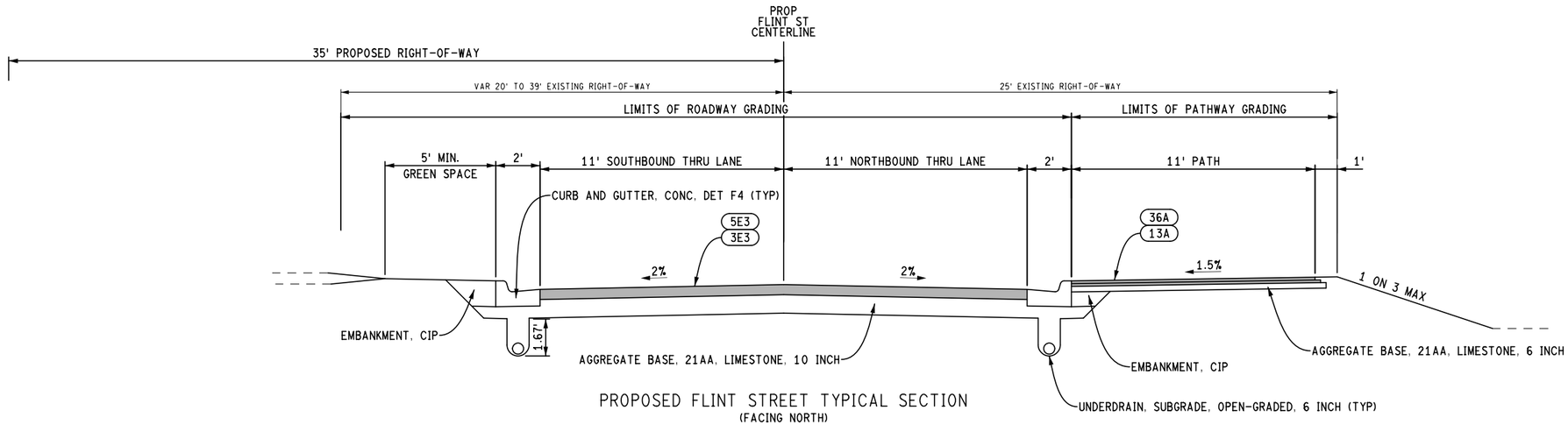
DATE
10/12/18

SHEET
3

0 VERT. (FT) 6
0 HORZ. (FT) 6



PROPOSED BOND STREET TYPICAL SECTION
(AT GRAND RIVER INTERSECTION, FACING NORTHWEST)



PROPOSED FLINT STREET TYPICAL SECTION
(FACING NORTH)

FILE: 82577_typ_03.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

PROPOSED TYPICAL SECTIONS

JOB
60582577
DATE
10/12/18
SHEET
4

0 VERT. (FT) 6

0 HORZ. (FT) 6

GENERAL NOTES

STANDARDS AND SPECIFICATIONS
All work must be completed in accordance with the City of Novi Standards and Specifications.

MAINTAINING TRAFFIC
Construct Flint Street under a full road closure.

UNDERGROUND UTILITIES / MISS DIG
For protection of underground utilities and in conformance with Public Act 53, 1974, the Contractor shall dial 1-800-482-7171 a minimum of three full working days, excluding Saturdays, Sundays, and holidays prior to beginning each excavation in areas where public utilities have not been previously located. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be a part of the "Miss Dig" alert system.

If plan information indicates an existing underground utility is or will be out of service within the limits of this contract. The Contractor is cautioned to treat such a line as if it were still in service and notify "Miss Dig" when working in the area of the out of service facility.

All utility information is approximate and is based on information provided by the owners.

Underground utilities within landscaped entrance islands are not part of MISS DIG's system. Use extreme caution in these areas.

EXISTING WATER MAINS AND SEWERS
The Contractor shall be responsible for any damage to properly identified existing water mains and/or existing sewers during the construction of this project.

TRASH COLLECTION
When access by refuse collection vehicles is not provided, Contractor shall collect, deliver and return refuse containers from individual driveways and deliver to a central location for pickup by refuse haulers. Refuse in the City of Novi is collected by various private firms on scheduled days.

MAIL COLLECTION AND DELIVERY
Mail collection and delivery must be maintained during construction. If access for mail delivery is interrupted, Contractor shall furnish and assemble temporary collection and delivery boxes for each affected property at a central location, which will be determined by the Novi Postmaster. Mailboxes to be a type approved for use the U.S. Postmaster.

CONTRACTOR PARKING
Contractor parking areas will be limited to public ROW areas only. Do not occupy open roadways with parked vehicles.

HYDRANT USE
The Contractor is required to contact the City's DPW facility at 248-735-5640 to make arrangements prior to use.

SAWCUTS
The Contractor shall sawcut the existing pavement at all removal limits as shown on plans or directed by Engineer to provide a smooth vertical edge. This will not be paid for separately.

OPEN EXCAVATION
Protective fencing around all open excavations is required. This will not be paid for separately.

DETECTABLE WARNING SURFACE
Sidewalk ramps with detectable warning surface shall be constructed in accordance with the MDOT Standard Plan R-28 Series.

SLOPES
Class A slopes shall be constructed on this project.

DUST CONTROL
The Contractor is responsible for controlling dust on the project by spraying water on any aggregate or surfaces not restored as requested by the Engineer. This will not be paid for separately.

SURFACE RESTORATION
Surface restoration will be paid on a Lump Sum basis. Limits of restoration are to ROW along each side of Taft Rd centerline and any easements shown on plans. Seeding Mixture THM shall be used for all areas.

TREE PROTECTION NOTES

ROOT PROTECTION
1. Any damage to tree roots is to be reported to the on-site construction observer or owner.
2. Do not drive or park any vehicle or equipment, store any materials, or wash any equipment or materials within the drip line of any tree. These or other actions within the drip line may be considered damage by the Engineer.
3. Conduct operations to minimize excavations adjacent to trees. Where required work exposes tree roots, place wet mulch or other approved materials as soon as possible. Consult with Engineer or City Forester prior to beginning work.

TREE PROTECTION BARRIER
1. All trees within the work zone shall have tree protection barrier installed prior to construction unless otherwise directed by the Engineer. Tree protection barrier ordered by the Engineer will be measured and paid for as silt fence.
2. Barrier to be silt fence material and placed for use as visual and physical tree protection barrier. It is not required that toe be buried or sections be overlapped as for soil erosion control.
3. Any damage to any tree is to be reported to the on-site construction observer or owner.
4. Contractor is responsible for any tree damage. Trees determined to be damaged in the opinion of the Engineer shall be replaced at the Contractor's expense.

SOIL EROSION AND SEDIMENTATION CONTROL

SEQUENCE OF CONSTRUCTION
1. Prior to removing pavement, sidewalk, or driveways, or commencing grading operation; place temporary SESC measures (inlet filters and silt fence). Engineer's approval of SESC measures must be obtained prior to excavation. Approval by the Engineer is also required for material stockpile and staging area locations. Material stockpiles shall be ringed with silt fence.
2. Installation of silt fencing or tree protection fencing shall not occur prior to the initial city pre-construction meeting. When natural features exist on the site, inspection of staking may be required prior to the installation of the fencing.
3. During construction, maintain all temporary SESC measures. When inlet convers are removed, inlet filters shall be lowered and remain on the structures at all times. Address any deficiencies in SESC measures immediately.
4. Within five days of the completion of paving, permanent seeding shall be placed.
5. Remove temporary SESC measures within one week of placing permanent seeding.

SESC NOTES
1. Contractor is responsible for installation and maintenance of all soil erosion and sedimentation control measures and for full compliance with the soil erosion and sedimentation control permit to be issued for the project.
2. Temporary soil erosion and sedimentation control measures shall include inlet filters and silt fence in this project. Inlet filters shall be ACF Environmental Silt Sack or approved equal. Silt Fencing shall be Synthetic Industries "Terra Tex", Exxon "GTF-180", or approved equal.
3. All SESC measures shall be constructed in accordance with the Oakland County details included in the plans.
4. Inlet filters shall be installed on all drainage inlet structures within the reconstruction limits and on structures downstream of the reconstruction area which, in the opinion of the Engineer, may receive runoff from the work area.
5. Silt fencing shall be installed at locations determined by the Engineer.
6. Temporary pumps, if required, shall be discharged into a filter bag or similar device. Contractor shall obtain advance approval from the Engineer for all dewatering operations and filter devices to be used.
7. Street sweeping and dust control shall be the responsibility of the Contractor, and shall be completed daily or as directed by the Engineer.
8. All drainage ditches shall be stabilized with erosion control blanket and shall utilize check dams as necessary. Drainage ditches steeper than 3% shall be sodded.
9. Permanent seeding, including topsoil, fertilizer, and mulch blankets shall be placed on all unpaved disturbed areas in accordance with the MDOT Standard Specifications. Seeding work shall be completed on each roadway within five days of the completion of paving work on that roadway.
10. Stockpile locations shall be ringed with silt fence. All stockpile locations shall be approved by the Engineer.

SOIL SURVEY
The soils in the proposed Bond St. Construction area include
- Urban land

IRRIGATION AND LANDSCAPE LIGHTING SYSTEMS

Contractor shall protect irrigation and landscape lighting systems from damage. If damaged, the Contractor shall restore all irrigation and landscape lighting systems at the Contractor's expense.

FILE:NOV12.CEL
AUTH | DATE | REVISION

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CITY OF NOVI

BOND ST CONSTRUCTION

GENERAL NOTES

JOB
60582577
DATE
10/12/18
SHEET
5

QUANTITY SHEET

FILE:NOV12.CEL

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

QUANTITY SHEET

JOB
60582577

DATE
10/12/18

SHEET
6

SURVEY

- ALIGNMENT POINT MONUMENT
- MONUMENT BOX
- CP CONTROL POINT
- BM BENCHMARK

BOUNDARY

- CITY LIMIT
- PARCEL-L — PARCEL - LEGAL
- PARCEL-NL — PARCEL - NON-LEGAL
- PLAT-L — PLAT - LEGAL
- PLAT-NL — PLAT - NON-LEGAL
- ROW - FREE ACCESS
- ROW - LIMITED ACCESS
- SEC — SECTION LINE
- SEC 1/4 — SECTION LINE - QUARTER
- SEC 1/8 — SECTION LINE - EIGHTH
- SEC 1/16 — SECTION LINE - SIXTEENTH
- CONCRETE MONUMENT
- PARCEL CORNER
- PLAT CORNER
- ROW MONUMENT
- SECTION CORNER - CENTER
- SECTION CORNER - MEANDER
- SECTION CORNER - QUARTER
- SECTION CORNER - QUARTER-HALF
- SECTION CORNER - SECTION
- SECTION CORNER - SECTION-HALF
- SECTION CORNER - SIXTEENTH
- SECTION CORNER - WITNESS

MONUMENT PRESERVATION

- PRESERVE — PRESERVE MONUMENT
- PROTECT — PROTECT MONUMENT

SIGNS

- POST - DOUBLE
- POST - SINGLE

BARRIERS

- CONCRETE BARRIER - DOUBLE FACE
- CONCRETE BARRIER - SINGLE FACE
- FENCE
- GUARDRAIL - NOT TO SCALE
- GUARDRAIL - TRUE SCALE
- NOISE BARRIER
- FENCE POST
- 123 — GUARDRAIL RUN NUMBER
- IMPACT ATTENUATOR
- POST - MAILBOX
- POST - NO ID

UTILITIES

- U — UNKNOWN UTILITY
- U — UTILITY - OUT OF SERVICE
- U — UTILITY - TO BE REMOVED
- U — UTILITY - TO BE TAKEN OUT OF SERVICE
- CATCH BASIN COVER
- MANHOLE COVER
- MARKER
- PEDESTAL
- SEWER CLEANOUT ACCESS
- STRUCTURE BOTTOM (DIA VARIES)
- UNKNOWN UTILITY BOX
- FO — FIBER OPTIC
- FO-OH — FIBER OPTIC - OVERHEAD
- FIBER OPTIC MARKER
- C — CABLE
- C-OH — CABLE - OVERHEAD
- CABLE MARKER
- CABLE PEDESTAL
- T — TELEPHONE
- T-OH — TELEPHONE - OVERHEAD
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- PETRO — PETROLEUM PIPELINE
- GASOLINE FILLER PIPE
- GASOLINE PUMP
- GASOLINE UNDERGROUND TANK
- PETROLEUM PIPELINE MARKER
- PETROLEUM WELL
- P — PROPANE TANK
- G — NATURAL GAS LINE
- NATURAL GAS MARKER
- NATURAL GAS VALVE
- NATURAL GAS WELL
- SANITARY SEWER
- SANITARY SEWER MANHOLE WITH COVER (DIA VARIES)
- I — IRRIGATION
- W — WATER MAIN
- FIRE HYDRANT
- GATE VALVE AND BOX
- GATE VALVE IN WELL
- IRRIGATION CONTROL VALVE
- IRRIGATION SPRINKLER HEAD
- SERVICE METER
- SERVICE SHUTOFF
- WATER WELL

UTILITIES

- E — ELECTRICAL CABLE
- E-OH — ELECTRICAL CABLE OVERHEAD
- E — ELECTRICAL CABLE IN CONDUIT
- ELECTRICAL CABLE IN CONDUIT - DIRECTIONAL BORE
- ELECTRICAL CONTROLLER CABINET - PAD MOUNTED
- Hh — ELECTRICAL HANDHOLE
- MH — ELECTRICAL MANHOLE
- ELECTRICAL POLE UTILITY - EXISTING
- ELECTRICAL POLE UTILITY - PROPOSED
- T — ELECTRICAL TRANSFORMER - PAD MOUNTED
- LIGHTING CONTROL PANEL
- LIGHT POST
- R&S — LIGHT STANDARD EXISTING - TO BE REMOVED & SALVAGED

VEGETATION

- BRUSH LINE
- HEDGE LINE
- TREE LINE - CANOPY OR TRUNK
- TREE LINE - TRUNK
- TRUNK LINE
- SHRUB
- TREE - CONIFER
- TREE - DECIDUOUS
- TREE - STUMP

ROADSIDE / SITE

- ANTENNA
- BIG ROCK
- FLAG POLE
- PICNIC STOVE
- PICNIC TABLE
- SATELLITE DISH

RAILROAD

- TRACK
- CROSSING - GATE
- RR — CROSSING - SIGNAL BOX
- CROSSING - SIGNAL FLASHING
- CROSSING - SYMBOL

ENVIRONMENTAL

- 26 — EROSION CONTROL - SILT FENCE
- WETLAND
- WETLAND - SPOT EL
- CONTAMINATION - MONITORING WELL
- 12 — EROSION CONTROL NUMBER
- EROSION CONTROL - RIPRAP
- W.T. 12' — WATER TABLE - PLAN NOTE
- POTENTIALLY CONTAMINATED SITE

GENERAL LABELING

- LEFT TURN ARROW
- TRAFFIC FLOW ARROW
- A — ABANDON
- B — BULKHEAD
- C — CLEARING
- R — REMOVE
- SALV — SALVAGE
- S — SAVE
- ADJ — ADJUST
- ADJ-B — ADJUST - STRUC COVER WITH TYPE
- ADJ-B/O — ADJUST - BY OTHERS
- REL-1 — RELOCATE - WITH CASE NUMBER
- REL-B/O — RELOCATE - BY OTHERS
- SSL — SSL — SLOPE STAKE LINE
- BH# — BORING

DRAINAGE

- CATCH BASIN W/ COVER (DIA VARIES)
- 12 — DRAINAGE STRUCTURE NUMBER
- DRAIN CASTING
- DROP INLET
- END SECTION (SIZE VARIES)
- FLOW DIRECTION ARROW
- HEADWALL (SIZE VARIES)
- MANHOLE W/ COVER (DIA VARIES)
- MANHOLE BASE W/ COVER (SIZE VARIES)
- MANHOLE TEE W/ COVER (SIZE VARIES)
- OUTLET HEADWALL (SIZE VARIES)
- CULVERT - EXISTING
- CULVERT (SIZE VARIES)
- DITCH CENTERLINE
- STORM SEWER - EXISTING
- STORM SEWER
- STORM SEWER - TO BE REMOVED
- UNDERDRAIN
- WATER EDGE

SURFACING

REMOVAL

- CONCRETE RUBBLIZING OR HMA CRUSH & SHAPE
- HMA COLDMILLING
- HMA SURFACE REMOVAL AND / OR PAVEMENT REMOVAL

PROPOSED

- AGGREGATE APPROACH
- BRIDGE APPROACH
- HMA APPROACH
- MISCELLANEOUS CONCRETE
- CURB & GUTTER REMOVAL

SIDEWALK & NON-MOTORIZED

- SIDEWALK - REMOVAL
- SIDEWALK - CONCRETE RAMP
- NON-MOTORIZED HMA PATH
- NON-MOTORIZED BOARDWALK
- SIDEWALK - DETECT. WARNING SURF.
- SIDEWALK - LANDING
- SWR-F — SIDEWALK - RAMP LABEL

TYPICAL SECTION

- CONCRETE - PROPOSED
- HMA - PROPOSED

MAINTAINING TRAFFIC

- TYPE III BARRICADE
- CHANNELIZING DEVICE - CONE
- CHANNELIZING DEVICE - DRUM
- LIGHT - HIGH INTENSITY TYPE B
- LIGHT - STEADY BURN TYPE C
- LIGHTED ARROW PANEL - BAR
- LIGHTED ARROW PANEL
- PORTABLE CHANGEABLE MESSAGE SIGN
- TRAFFIC REGULATOR
- TEMPORARY SIGN
- TEMPORARY TRAFFIC SIGNAL
- WORK AREA

NOTE:

EXISTING ITEMS ARE REPRESENTED BY THIN LINE WEIGHTS.
PROPOSED ITEMS ARE REPRESENTED BY HEAVIER LINE WEIGHTS.

FILE: 82577_Novi_LEGEND.DGN
AUTH | DATE | REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

LEGEND SHEET

JOB 60582577
DATE 10/12/18
SHEET 7

BOND ST ℄
Δ = 61° 10' 00" (RT)
D = 28° 38' 52"
T = 118.20'
L = 213.51'
R = 200.00'
E = 32.32'
PC = 22+65.37 N = 357,856.29 E = 13,363,706.93
PI = 23+83.58 N = 357,849.78 E = 13,363,588.91
PT = 24+78.89 N = 357,950.03 E = 13,363,526.29

HAZARDOUS OR FLAMMABLE MATERIAL

EX DRAINAGE EASEMENT

PARCEL-L

BOND ST (PUBLIC)

PROP 70' ROW

EX 75' ROW

EX ROW

PARCEL-ML

PARCEL-NL

EX 100' ROW

PI=23+83.58

PT=24+78.89

PC=22+65.37

R EX FENCE

CULVERT TO BE CONSTRUCTED PRIOR TO THIS PROJECT

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

25'

EX DRAINAGE EASEMENT

50-22-22-227-029
25875 NOVI RD
CITY CENTER PLAZA

BEGIN PHASE 1
BOND ST
STA 22+13

NOVI ROAD (PUBLIC)

MAIN ST (PUBLIC)

S 86° 50' 33" W

NOTE: TREES TO BE REMOVED PRIOR TO CONSTRUCTION WITH SEPARATE CONTRACT

0 HORZ. (FT) 40

FILE: 82577_2100.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

REMOVAL SHEET STA 21+00 TO STA 26+00

JOB 60582577

DATE 10/12/18

SHEET 8

BOND ST ℄
Δ = 61° 10' 00" (RT)
D = 28° 38' 52"
T = 118.20'
L = 213.51'
R = 200.00'
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PC = 22+65.37 N = 357,856.29 E = 13,363,706.93
PI = 23+83.58 N = 357,849.78 E = 13,363,588.91
PT = 24+78.89 N = 357,950.03 E = 13,363,526.29

HAZARDOUS OR FLAMMABLE MATERIAL

PROPOSED WATERMAIN AND SANITARY TO BE CONSTRUCTED BY 'THE BOND' DEVELOPMENT

N

BOND ST (PUBLIC)

EX DRAINAGE EASEMENT

PROP DRIVEWAY (CONSTRUCTED BY OTHERS)

REL-B/O

8' SIDEWALK, CONC, 4 INCH (CONSTRUCTED BY OTHERS)

PI=23+83.58

PROP DRIVEWAY (CONSTRUCTED BY OTHERS)

PROP CONCRETE IN CULVERT AREA

ADJ

PT=24+78.89

10' HMA PATH

CULVERT TO BE CONSTRUCTED PRIOR TO THIS PROJECT

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

CURB AND GUTTER, CONC, DET F4 (TYP)

PROP 70' ROW

EX 75' ROW

EX ROW

PROP 8' SIDEWALK BY NOVI

TLX ROW

AT&T

PC=22+65.37

BEGIN PHASE 1 BOND ST STA 22+13

NOVI ROAD (PUBLIC)

MAIN ST (PUBLIC)

S 86° 50' 33" W

EX 100' ROW

50-22-22-227-029
25875 NOVI RD
CITY CENTER PLAZA

PARCEL-L

PARCEL-NL

PARCEL-ML

L21 L22 L23

0 HORZ. (FT) 40

FILE: 82577_2100.dgn
AUTH | DATE | REVISION

AECOM

CITY OF NOVI

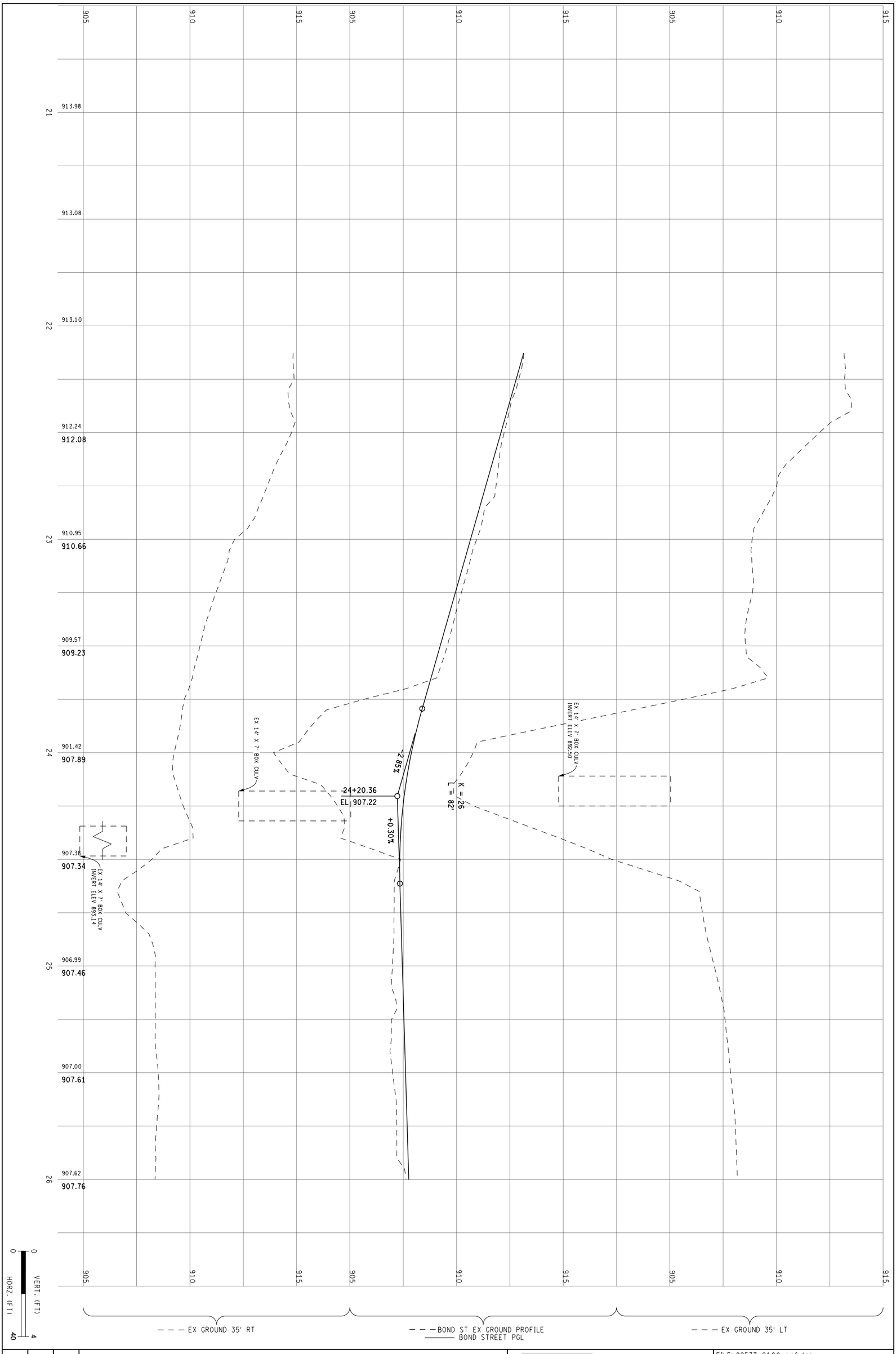
BOND ST CONSTRUCTION

CONSTRUCTION SHEET STA 21+00 TO STA 26+00

JOB 60582577

DATE 10/12/18

SHEET 9



SHEET 10	DATE 10/12/18	JOB 60582577	BOND ST CONSTRUCTION PROFILE SHEET STA 21+00 TO STA 26+00	CITY OF NOVI AECOM

FILE: 82577_2100_prf.dgn

AUTH	DATE	REVISION

HAZARDOUS OR FLAMMABLE MATERIAL

50-22-22-226-003
43443 FLINT ST
HUNTER DEVELOPMENT CO

50-22-22-226-005
FLINT ST
HUNTER DEVELOPMENT CO

BOND ST (PUBLIC)

PC=30+91.58

N 31° 59' 28" W

PROP 70' ROW

EX 75' ROW

EX ROW

HO-3

E-OH

15" SAN

SSL

26 27 28 29 30

EXPIRED EX EASEMENT

EX EASEMENT

PARCEL 1

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

EX DRAINAGE EASEMENT

NOTE: TREES TO BE REMOVED PRIOR TO CONSTRUCTION WITH SEPARATE CONTRACT

0 40 HORZ. (FT)

FILE: 82577_2600.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

REMOVAL SHEET STA 26+00 TO STA 31+00

JOB 60582577

DATE 10/12/18

SHEET 11

PROPOSED WATERMAIN AND SANITARY
TO BE CONSTRUCTED BY
'THE BOND' DEVELOPMENT

N

HAZARDOUS OR
FLAMMABLE MATERIAL

50-22-22-226-003
43443 FLINT ST
HUNTER DEVELOPMENT CO

8' SIDEWALK, CONC, 4 INCH
(CONSTRUCTED BY OTHERS)

REL-B/O

EX EASEMENT

LIBERTY

EX EASEMENT

HO-3

50-22-22-226-005
FLINT ST
HUNTER DEVELOPMENT CO

PROP DRIVEWAY
(CONSTRUCTED BY OTHERS)

BOND ST (PUBLIC)

PC=30+98.58

PROP 70' ROW

EX 75' ROW

26 EX ROW HO-3 30' 27 HO-3 E-OH 28 E-OH 30' E-OH 29 HO-3 30 HO-3 EX ROW

22'

22'

ADJ

N 31° 59' 28" W

15" SAN

ADJ

REL-B/O

REL-B/O

10'

10' HMA PATH

CURB AND GUTTER, CONC, DET F4 (TYP)

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

EX ROW

EX ROW

EX EASEMENT

PARCEL-L

EX EASEMENT

EX EASEMENT

EX DRAINAGE EASEMENT

0 HORZ. (FT) 40

FILE: 82577_2600.dgn

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CITY OF NOVI

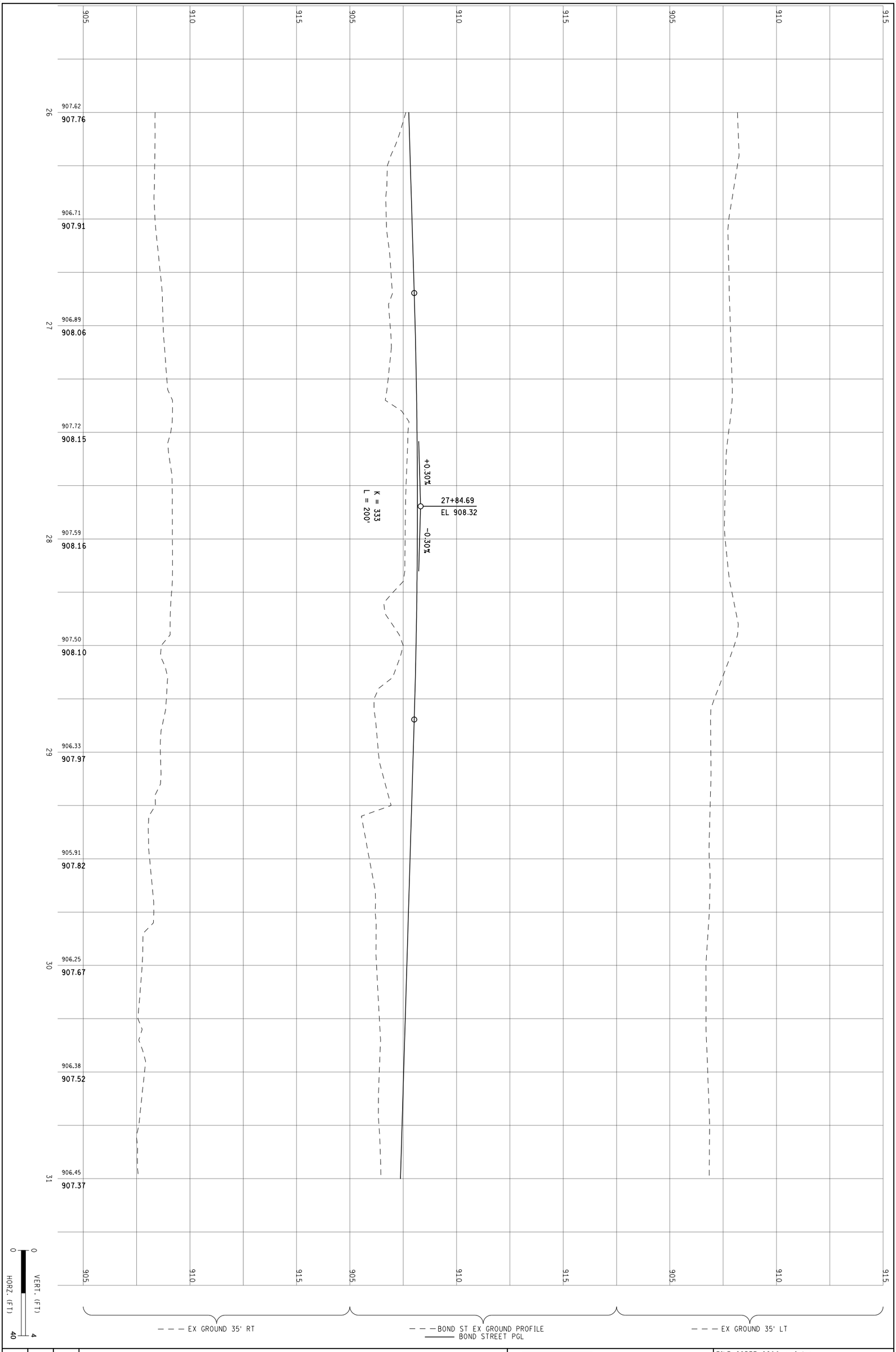
BOND ST CONSTRUCTION

CONSTRUCTION SHEET STA 26+00 TO STA 31+00

JOB
60582577

DATE
10/12/18

SHEET
12



SHEET	DATE	JOB
13	10/12/18	60582577

BOND ST CONSTRUCTION

PROFILE SHEET STA 26+00 TO STA 31+00

CITY OF NOVI

AECOM

FILE: 82577_2600_prf.dgn

AUTH	DATE	REVISION

BOND ST ℄
Δ = 40° 49' 10" (LT)
D = 27° 09' 16"
T = 78.51'
L = 150.32'
R = 211.00'
E = 14.13'
PC = 30+91.53 N = 358,469.63 E = 13,363,201.72
PI = 31+70.04 N = 358,536.21 E = 13,363,160.13
PT = 32+41.85 N = 358,559.42 E = 13,363,085.12

END PHASE 1
BOND ST
STA 35+70

BEGIN PHASE 2
BOND ST
STA 35+70

BOND ST (PUBLIC)

PROP 70' ROW

EX 75' ROW

PROP 70.5' ROW

POT=50+00.00

N 72° 48' 37" W

PC=34+29.49

PI=32+41.85

PI=31+70.04

EX FENCE (R)

EX DETENTION POND
TO BE RELOCATED

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

EX ROW

EX EASEMENT

PARCEL-L

PARCEL-NL

HAZARDOUS OR
FLAMMABLE MATERIAL

CAUTION - CRITICAL
UTILITY

50-22-22-227-029
25875 NOVI RD
CITY CENTER PLAZA

50-22-22-227-001
43601 GRAND RIVER AVE
GL INVESTMENTS

50-22-22-477-001
GRAND RIVER AVE
GEORGE S KEROS

50-22-22-477-012
43707 GRAND RIVER AVE
LEE BEGOLE

22-226-005
FLINT ST
CENTER DEVELOPMENT CO

FLINT ST (PUBLIC)

N 16° 12' 06" E

15" SAN

8" CMP

E-OH

HO-T

AT&T

2" CE

9

END CONST
FLINT ST
STA 52+12

PROP ROW VARIES

POT=53+16.18

GRAND RIVER AVE (PUBLIC)

NOTE: TREES TO BE REMOVED PRIOR
TO CONSTRUCTION WITH SEPARATE CONTRACT

N

0 HORZ. (FT) 40

FILE: 82577_3100.dgn
AUTH | DATE | REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

REMOVAL SHEET STA 31+00 TO STA 36+00

JOB
60582577

DATE
10/12/18

SHEET
14

BOND ST ℄
Δ = 40° 49' 10" (LT)
D = 27° 09' 16"
T = 78.51'
L = 150.32'
R = 211.00'
E = 14.13'
PC = 30+91.53 N = 358,469.63 E = 13,363,201.72
PI = 31+70.04 N = 358,536.21 E = 13,363,160.13
PT = 32+41.85 N = 358,559.42 E = 13,363,085.12

PROPOSED WATERMAIN AND SANITARY TO BE CONSTRUCTED BY 'THE BOND' DEVELOPMENT

22-226-005
FLINT ST
CENTER DEVELOPMENT CO

PROP DRIVEWAY (CONSTRUCTED BY OTHERS)

8' SIDEWALK, CONC, 4 INCH (CONSTRUCTED BY OTHERS)

END PHASE 1 BOND ST STA 35+70

BEGIN PHASE 2 BOND ST STA 35+70

8' SIDEWALK, CONC, 4 INCH

BOND ST (PUBLIC)

ADJ

REL-B/O

PROP 70' ROW

EX 75' ROW

EX ROW

HO-3

E-OH

SSL

PARCEL-L

PARCEL-NL

POT=50+00.00

N 72° 48' 37" W

PC=34+29.49

10' HMA PATH

EX DETENTION POND TO BE RELOCATED

PROP 70.5' ROW

PI=31+70.04

WALLED LAKE BRANCH OF THE MIDDLE ROUGE RIVER

EX EASEMENT

PROP GUARDRAIL

HAZARDOUS OR FLAMMABLE MATERIAL

CAUTION - CRITICAL UTILITY

HO-1

AT&T

50-22-22-227-029
25875 NOVI RD
CITY CENTER PLAZA

FLINT ST (PUBLIC)

N 16° 12' 06" E

11'

8" CMP

15" SAN

REPAIR EX CULVERT

50-22-22-227-001
43601 GRAND RIVER AVE
GL INVESTMENTS

11' HMA PATH

END CONST FLINT ST STA 52+12

50-22-22-477-001
GRAND RIVER AVE
GEORGE S KEROS

HAZARDOUS OR FLAMMABLE MATERIAL

2" CE

PROP ROW VARIES

POT=53+16.18

50-22-22-477-012
43707 GRAND RIVER AVE
LEE BEGOLE

GRAND RIVER AVE (PUBLIC)

N

0 HORZ. (FT) 40

FILE: 82577_3100.dgn
AUTH | DATE | REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

CONSTRUCTION SHEET STA 31+00 TO STA 36+00

JOB 60582577
DATE 10/12/18
SHEET 15

910
905
910
905
910
905
910
905
910
905
900

K = 119
L = 123'

-0.30%

+0.74%

+0.74%

END PHASE 1
BOND ST
STA 35+70

BEGIN PHASE 2
BOND ST
STA 35+70

31+70.00
EL 907.16

906.45 907.37
906.52 907.29
907.27 907.42
907.74 907.75
908.12
908.49
908.86
909.23
909.60
909.96
910.06

31
32
33
34
35
36

— — EX GROUND 35' LT

— — BOND ST EX GROUND PROFILE
BOND STREET POL

— — EX GROUND 35' RT

VERT. (FT) 0 4
HORZ. (FT) 0 40

FILE: 82577_31100_prf.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

PROFILE SHEET STA 31+00 TO STA 36+00

JOB
60582577

DATE
10/12/18

SHEET
16

910
905
910
905
910
905
910
905
910
905
915
910
915
905
915
910
915
905
910
905

EX 84" CULV
APPROX INV ELEV 897.9

END CONST
FLINT ST
STA 52+12

908.00

51+49.24
EL 907.48

-0.35%

-2.17%

K = 48
L = 88'

EX 84" CULV
APPROX INV ELEV 894.6

907.59 908.00
907.69 907.82
907.55 907.65
907.21 907.27
906.39 906.38
905.30

50
51
52

--- EX GROUND 35' LT

--- BOND ST EX GROUND PROFILE
BOND STREET POL

--- EX GROUND 35' RT

0 VERT. (FT) 4
0 HORZ. (FT) 40

FILE: 82577_Flint_prf.dgn

AUTH	DATE	REVISION

AECOM

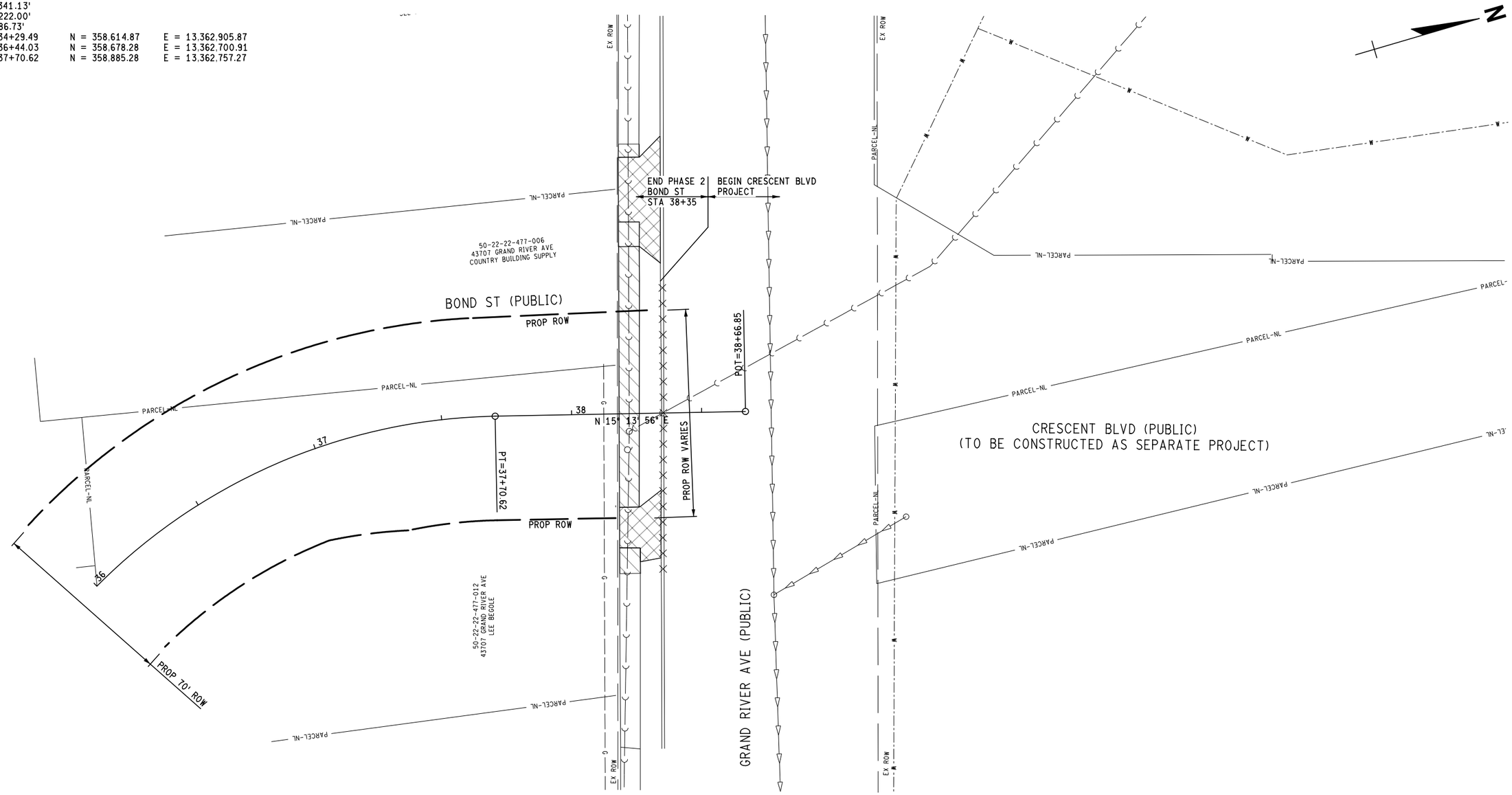
CITY OF NOVI

BOND ST CONSTRUCTION

PROFILE SHEET FLINT STREET

JOB
60582577
DATE
10/12/18
SHEET
17

BOND ST ℄
Δ = 88° 02' 34" (RT)
D = 25° 48' 32"
T = 214.54'
L = 341.13'
R = 222.00'
E = 86.73'
PC = 34+29.49 N = 358,614.87 E = 13,362,905.87
PI = 36+44.03 N = 358,678.28 E = 13,362,700.91
PT = 37+70.62 N = 358,885.28 E = 13,362,757.27



NOTE: TREES TO BE REMOVED PRIOR TO CONSTRUCTION WITH SEPARATE CONTRACT

0 HORZ. (FT) 40

FILE: 82577_3600.dgn
AUTH | DATE | REVISION

AECOM

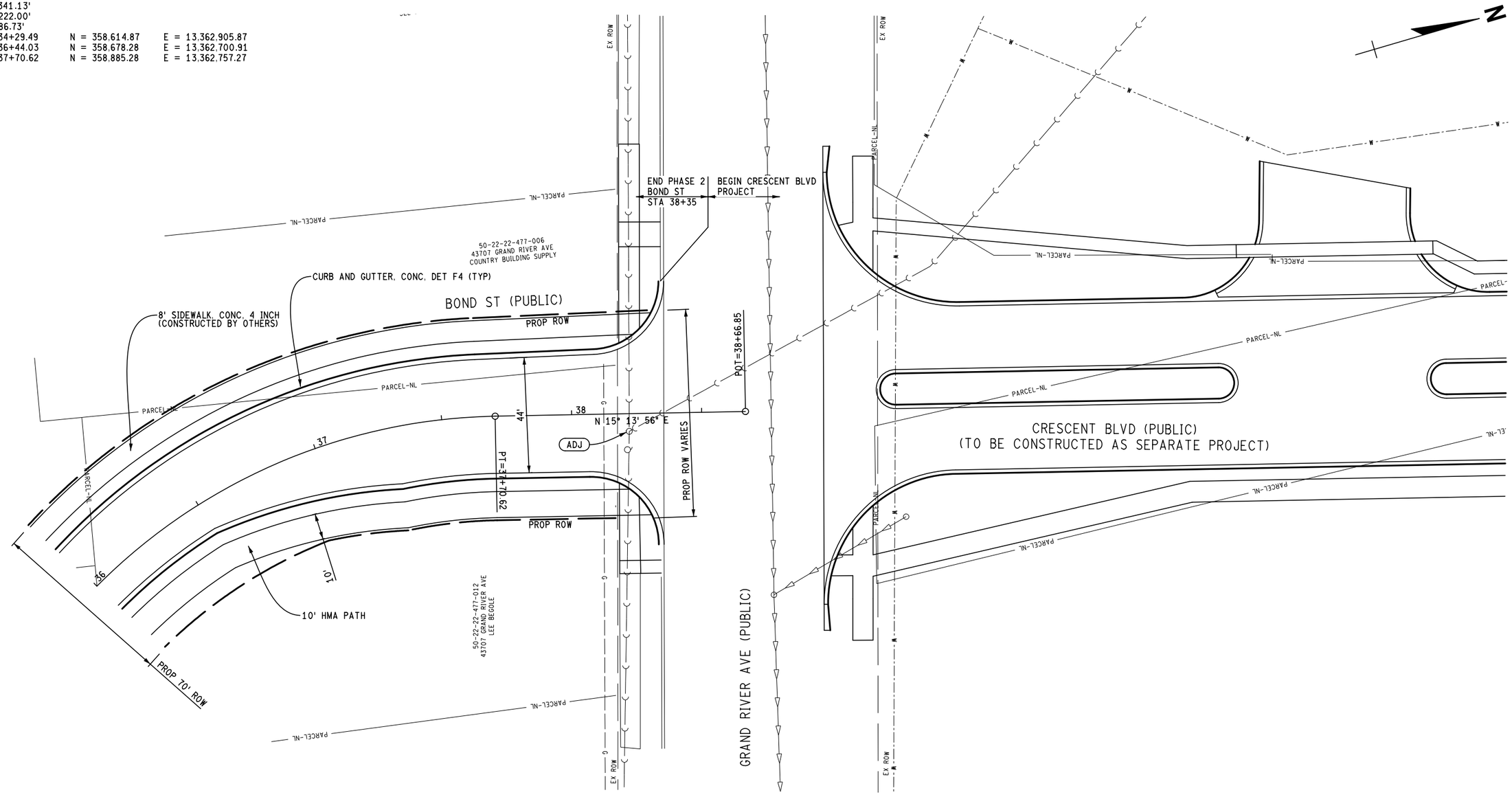
CITY OF NOVI

BOND ST CONSTRUCTION

REMOVAL SHEET STA 36+00 TO STA POE

JOB 60582577
DATE 10/12/18
SHEET 18

BOND ST ℄
Δ = 88° 02' 34" (RT)
D = 25° 48' 32"
T = 214.54'
L = 341.13'
R = 222.00'
E = 86.73'
PC = 34+29.49 N = 358,614.87 E = 13,362,905.87
PI = 36+44.03 N = 358,678.28 E = 13,362,700.91
PT = 37+70.62 N = 358,885.28 E = 13,362,757.27



NOTE: TREES TO BE REMOVED PRIOR TO CONSTRUCTION WITH SEPARATE CONTRACT

0 HORZ. (FT) 40

FILE: 82577_3600.dgn
AUTH | DATE | REVISION

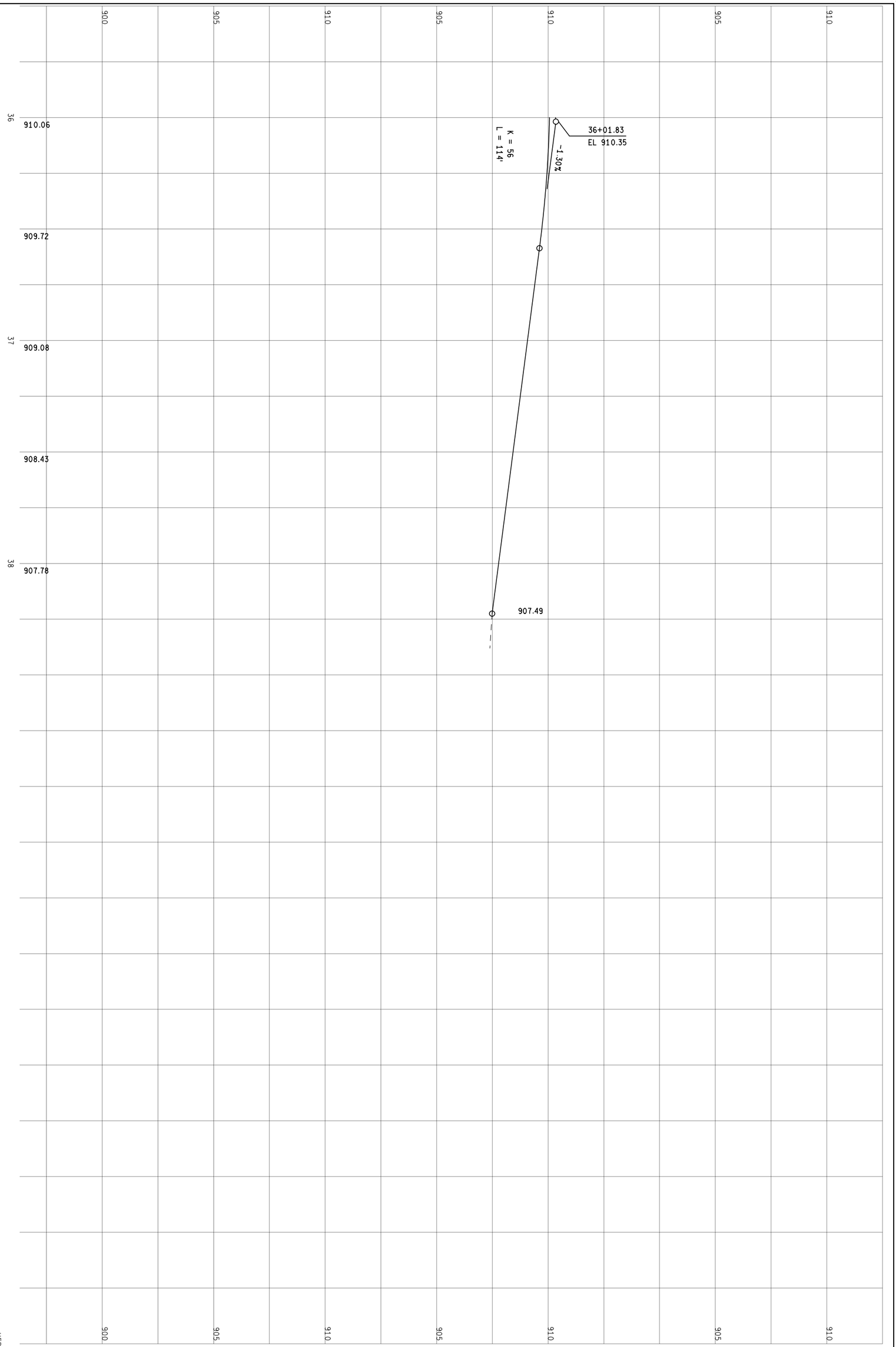
AECOM

CITY OF NOVI

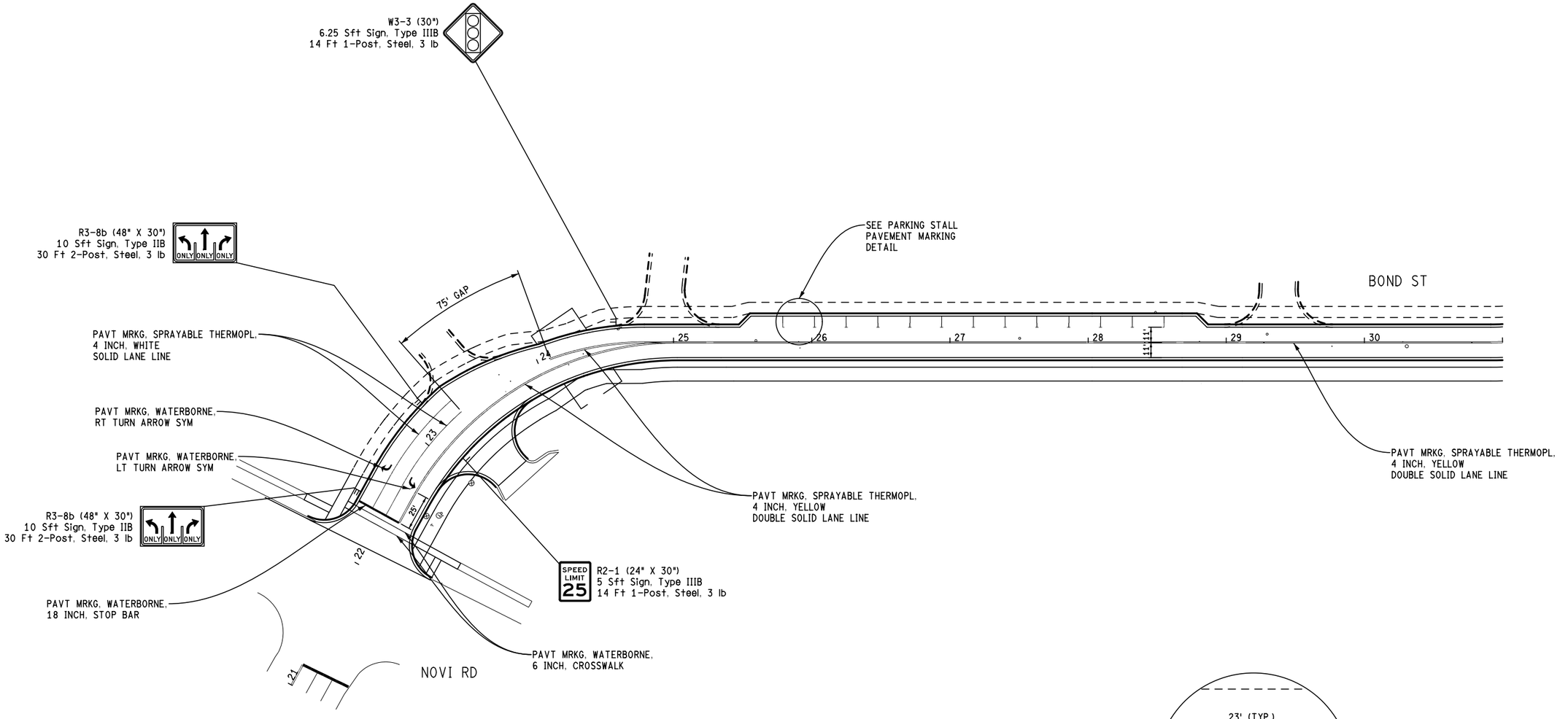
BOND ST CONSTRUCTION

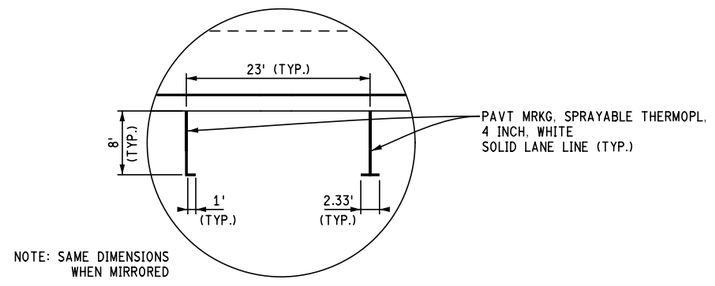
CONSTRUCTION SHEET STA 36+00 TO STA POE

JOB 60582577
DATE 10/12/18
SHEET 19



SHEET 20	DATE 10/12/18	JOB 60582577	BOND ST CONSTRUCTION PROFILE SHEET STA 36+00 TO STA POE	CITY OF NOVI AECOM	FILE: 82577_3600_prf.dgn AUTH | DATE | REVISION





NOTE: SAME DIMENSIONS WHEN MIRRORED

PARKING STALL PAVEMENT MARKING DETAIL

0 8 80 HORZ. (FT)

FILE: 82577_2100_Sign-PVMK.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

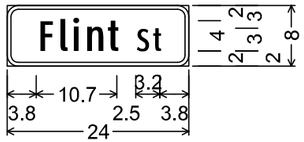
BOND ST CONSTRUCTION

PERMANENT SIGNING AND PAVEMENT MARKING STA 21+00 TO STA 31+00

JOB 60582577

DATE 10/12/18

SHEET 21

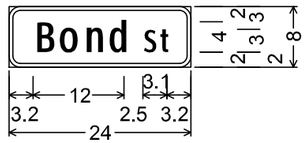


D3-1;
1.5" Radius, 0.5" Border, White on Green;
[Flint] ClearviewHwy-2-W;
[St] ClearviewHwy-2-W;
Table of widths and spaces.

3.8	F 1.8	0.9	l 1.0	0.8	i 0.7	1.0	n 2.2	0.8	t 1.5

2.5	S 1.6	0.5	t 1.1	3.8

SPECIAL SIGN #1

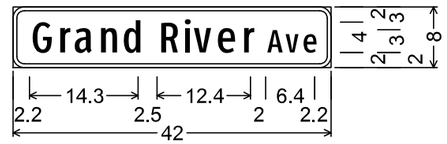


D3-1;
1.5" Radius, 0.5" Border, White on Green;
[Bond] ClearviewHwy-2-W;
[St] ClearviewHwy-2-W;
Table of widths and spaces.

3.2	B 2.3	0.8	o 2.4	1.0	n 2.2	1.0	d 2.3	

2.5	S 1.6	0.5	t 1.0	3.2

SPECIAL SIGN #2



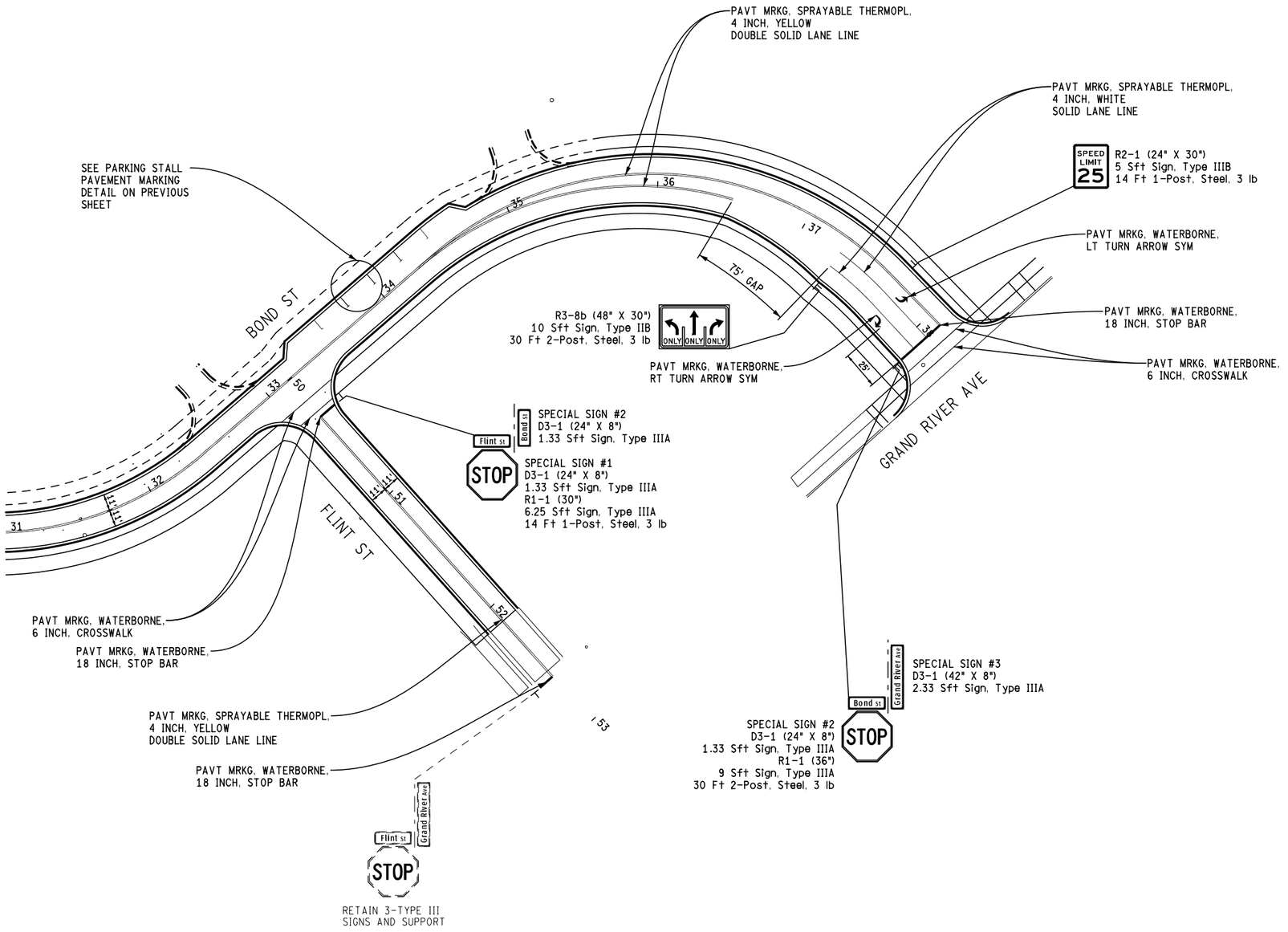
D3-1;
1.5" Radius, 0.5" Border, White on Green;
[Grand] ClearviewHwy-2-W;
[River] ClearviewHwy-2-W;
[Ave] ClearviewHwy-2-W;
Table of widths and spaces.

2.2	G 2.5	1.0	r 1.4	0.7	a 2.3	1.0	n 2.2	0.9	d 2.3

2.5	R 2.3	0.9	i 0.8	0.7	v 2.3	0.7	e 2.3	1.0	r 1.4

2.0	A 2.1	0.3	v 1.8	0.5	e 1.7	2.2

SPECIAL SIGN #3



FILE: 82577_3100_Sign-PVMK.dgn

AUTH	DATE	REVISION

AECOM

CITY OF NOVI

BOND ST CONSTRUCTION

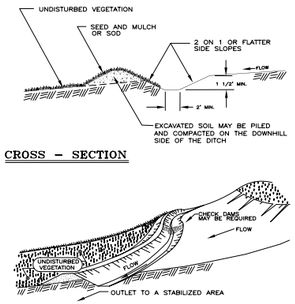
PERMANENT SIGNING AND PAVEMENT MARKING STA 31+00 TO STA POE

JOB 60582577

DATE 10/12/18

SHEET 22

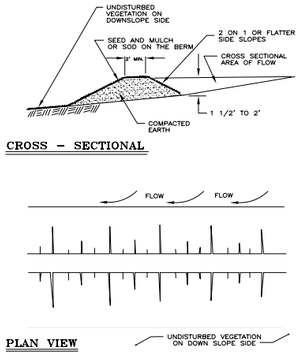
EARTH DIVERSION BERM (E-1)



CROSS – SECTION

ISOMETRIC VIEW

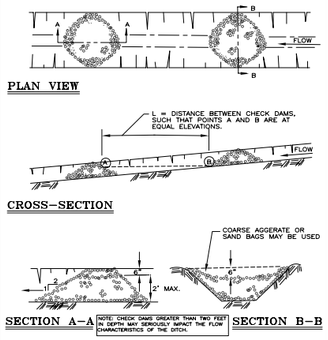
EARTH DIVERSION BERM (E-2)



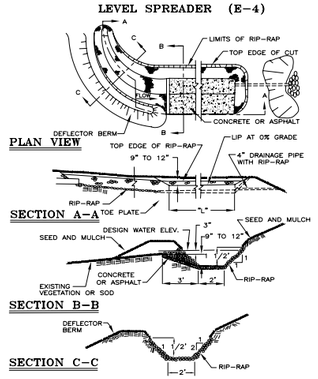
CROSS – SECTIONAL

PLAN VIEW

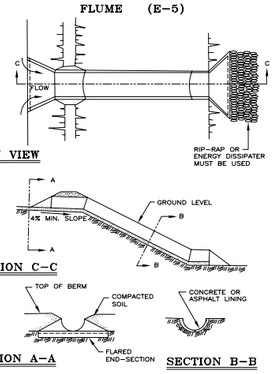
CHECK DAMS (E-3)



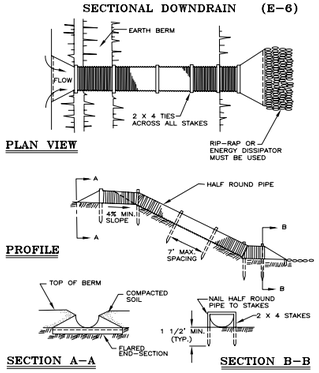
LEVEL SPREADER (E-4)



FLUME (E-5)



SECTIONAL DOWNDRAIN (E-6)

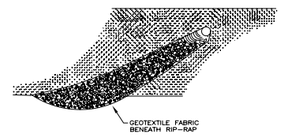


RIP-RAP (E-7)

DEFINITION — RIP-RAP IS A ROCK-TYPE MATERIAL PLACED ON THE LAND SURFACE TO RESIST THE ACTIONS OF FLOWING WATER.

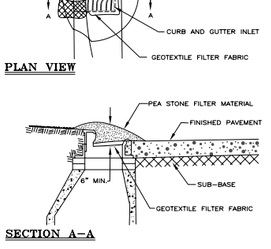
PURPOSE — THE PURPOSE OF RIP-RAP IS (1) TO DISSIPATE ENERGY RESULTING FROM FLOWING WATER, THUS REDUCING THE FLOW VELOCITY TO A LEVEL THAT IS NON-EROSIVE, AND (2) TO PROTECT THE LAND SURFACE FROM EROSION RESULTING FROM THE ENERGY FORCES GENERATED BY FLOWING WATER.

WHERE APPLICABLE — RIP-RAP IS USED (1) AT THE OUTLET OF A STORM DRAIN, (2) AS A CHANNEL LINING WHEN FLOW VELOCITIES AND CONCENTRATION ARE HIGH AND/OR THE CHANNEL SLOPE IS STEEP, (3) ON THE BANKS OF CHANNELS AT CHANGES IN FLOW DIRECTION, AND (4) TO STABILIZE ERODIBLE SLOPES.



SURFACE ROUGHENING (E-8) AND SCARIFICATION

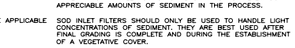
THIS IS AN EASY AND ECONOMICAL WAY TO REDUCE SOIL EROSION. IT IS SIMPLY THE PLACING OF HORIZONTAL GROOVES IN A SLOPE PERPENDICULAR TO THE FLOW OF RUNOFF. THIS CAN BE DONE BY EITHER DISC HARROWING, BACK BLADING OR JUST RUNNING THE TREADS OF A CRAWLER TRACTOR PERPENDICULAR TO THE SLOPE AS SHOWN BELOW.



VEGETATIVE BUFFER ZONE (SP-1)

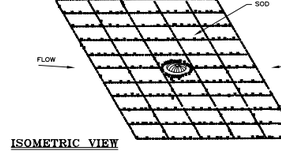
THE GRAPH LISTED BELOW IS USED TO DETERMINE THE ADEQUACY OF AN EXISTING VEGETATIVE BUFFER ZONE FOR USE AS A SEDIMENT FILTER. THIS GRAPH IS ONLY APPLICABLE IF THE VEGETATION IS A DENSE WELL-GROWN STAND OF GROUND COVER, AT LEAST 4" IN LENGTH. AN AREA COVERED WITH BUSHES AND TREES WITHOUT A GOOD GROUND COVER IS NOT ACCEPTABLE.

EXAMPLE

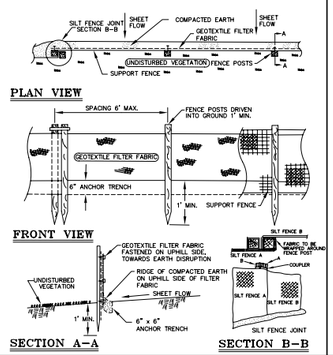


LENGTH OF BUFFER ZONE 80'
DROP OF BUFFER ZONE 4'
% OF SLOPE OF BUFFER ZONE 4'/80' X 100% = 5%

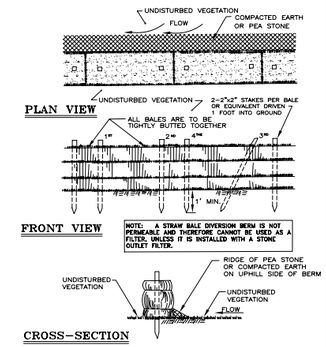
PLOT IN GRAPH BELOW — BUFFER ZONE IS ACCEPTABLE



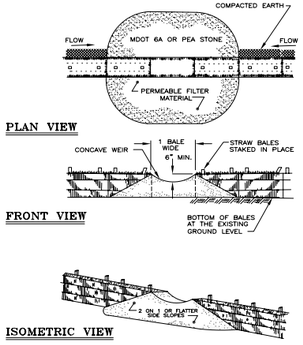
SILT FENCE (SP-2)



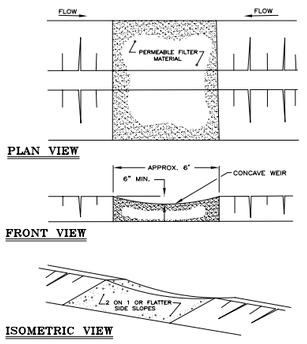
STRAW BALE DIVERSION BERM (SP-3)



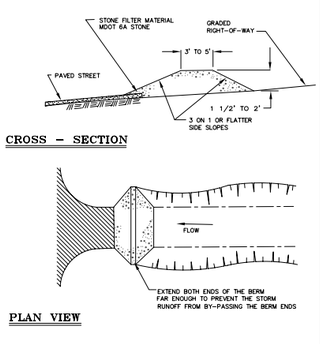
STRAW BALE DIVERSION BERM (SP-4)



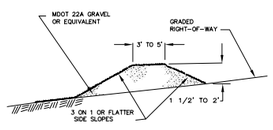
EARTH DIVERSION BERM (SP-5)



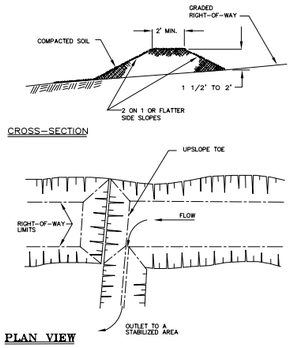
STONE FILTER BERM (SP-7)



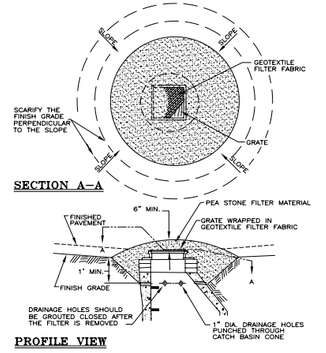
GRAVEL INTERCEPTOR DIKE (SP-8)



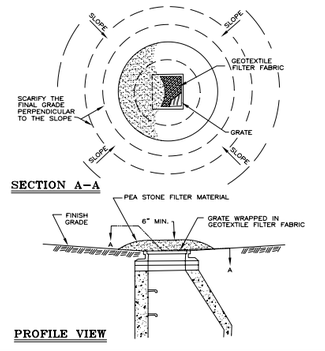
SOIL INTERCEPTOR DIKE (SP-9)



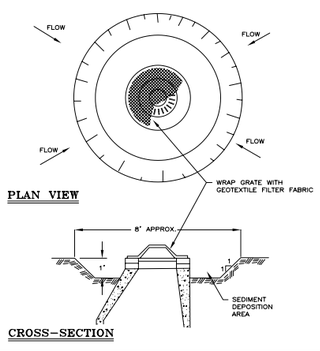
PARKING LOT INLET FILTER (SI-1)



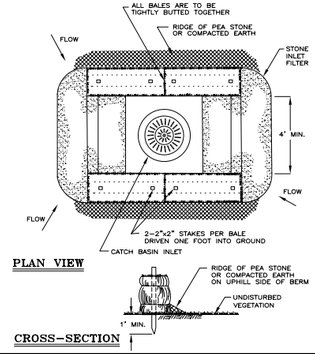
LOW POINT INLET FILTER (SI-2)



INLET SEDIMENT PIT (SI-3)

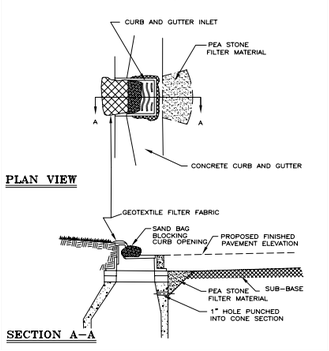


STRAW BALE INLET FILTER (SI-4)



CURB AND GUTTER INLET FILTER (SI-5)

(BEFORE PAVING)



CURB AND GUTTER INLET FILTER (SI-6)

(AFTER PAVING)

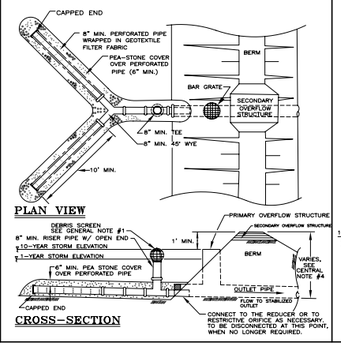
SOD INLET FILTER (SI-8)

DEFINITION — SOD INLET FILTER ARE PADS OF SOD PLACED AROUND A STORM DRAIN INLET OR CATCH BASIN.

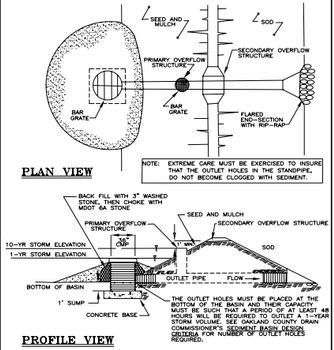
PURPOSE — SOD INLET FILTERS ARE INSTALLED TO SLOW THE FLOW OF WATER INTO AN INLET OR CATCH BASIN AND TO FILTER OUT APPRECIABLE AMOUNTS OF SEDIMENT IN THE PROCESS.

WHERE APPLICABLE — SOD INLET FILTERS SHOULD ONLY BE USED TO HANDLE LIGHT CONCENTRATIONS OF SEDIMENT. THEY ARE BEST USED AFTER FINAL GRADING IS COMPLETE AND DURING THE ESTABLISHMENT OF A VEGETATIVE COVER.

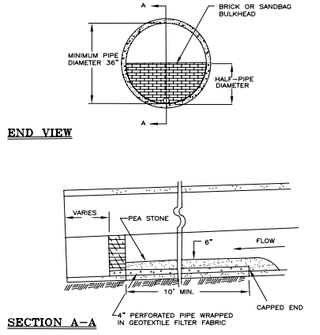
DETENTION BASIN OUTLET FILTER(PVC) (SO-1)



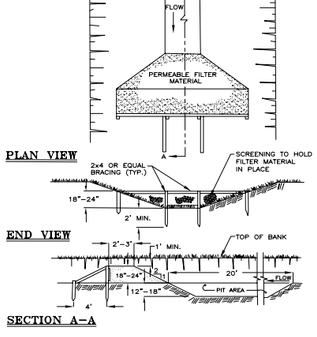
DETENTION BASIN OUTLET FILTER(CMP) (SO-2)



PIPE SEDIMENT BARRIER (SO-3)



DITCH SEDIMENT TRAP (SO-5)



NOTE:

ALL OF THE DETAILS SHOWN ON THIS SHEET, ALONG WITH INFORMATION PERTAINING TO PLAN PREPARATION, DESIGN CRITERIA AND GENERAL NOTES, ETC., ARE INCLUDED IN THE OAKLAND COUNTY DRAIN COMMISSIONER'S EROSION CONTROL MANUAL. PLEASE CONTACT THE EROSION CONTROL DIVISION AT (313) 858-5389 TO OBTAIN A COPY OF THE MANUAL.

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

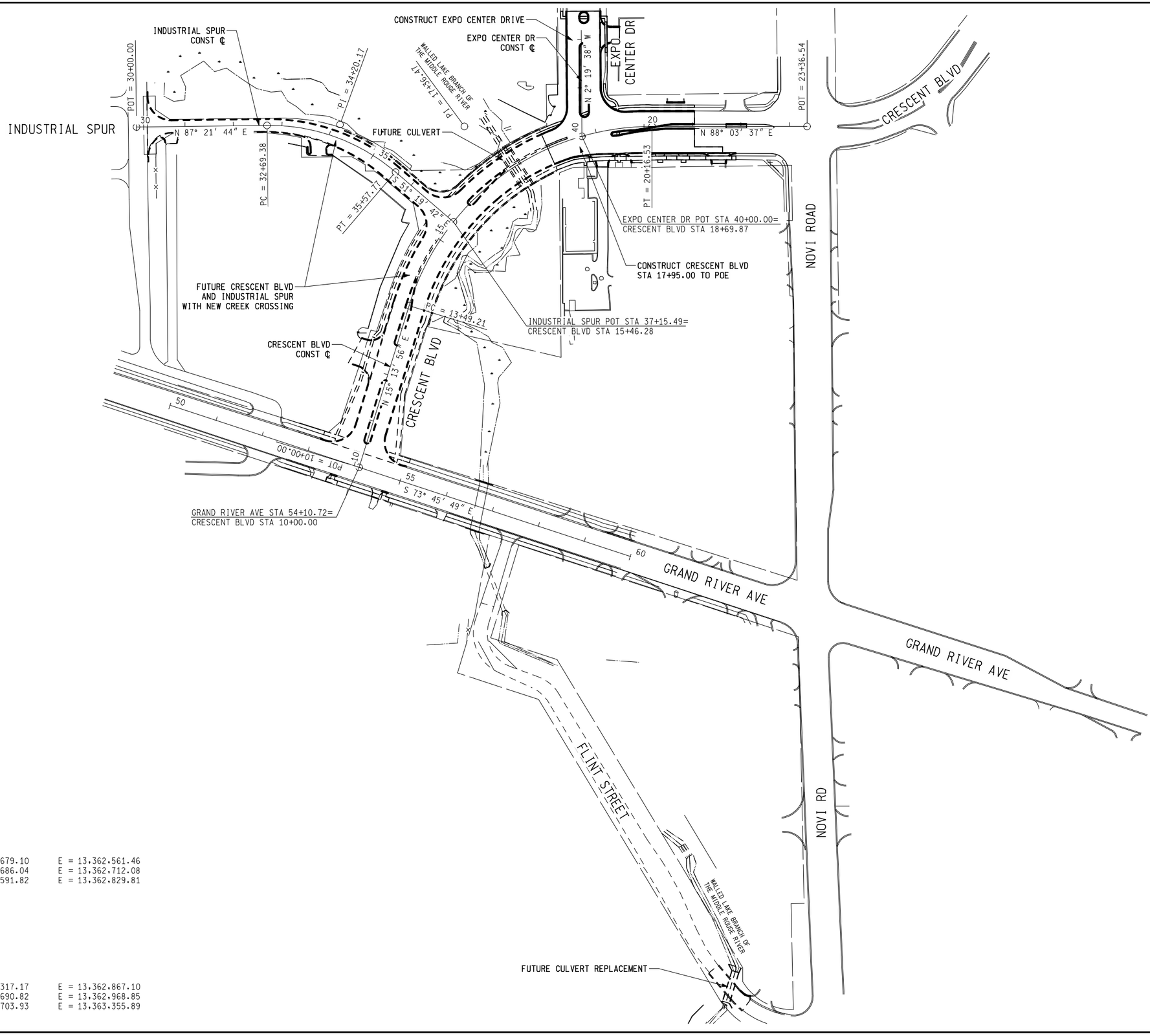
REVISION BLOCK				
Date Source / Source Date: N/A				
Rev. No.	Rev. By:	Rev. Date:	Description:	
1	LJC	01-10-06	SILT FENCE DETAIL (SP-2) - CHANGED THE WORD PLAN TO FRONT FOR THE LOWER LEFT VIEW	
2				
3				
4				

ORIG. DATE: 01/01/01
SCALE: NONE
DESIGNED BY: OCDC
DRAWN BY: OCDC Mapping

OCDC — OAKLAND COUNTY DRAIN COMMISSIONER — Jim Nash, Auditor/Drain Commissioner

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48328-1907

SHEET NO.: 23



INDUSTRIAL SPUR CURVE ℄
Δ = 41° 18′ 34″ (RT)
D = 14° 19′ 26″
T = 150.79′
L = 288.40′
R = 400.00′
E = 27.48′
PC = 32+69.38 N = 359,679.10 E = 13,362,561.46
PI = 34+20.17 N = 359,686.04 E = 13,362,712.08
PT = 35+57.77 N = 359,591.82 E = 13,362,829.81
PR. SUPER = NC

CRESCENT BLVD CURVE ℄
Δ = 72° 49′ 40″ (RT)
D = 10° 54′ 49″
T = 387.26′
L = 667.32′
R = 525.00′
E = 127.38′
PC = 13+49.21 N = 359,317.17 E = 13,362,867.10
PI = 17+36.47 N = 359,690.82 E = 13,362,968.85
PT = 20+16.53 N = 359,703.93 E = 13,363,355.89
PR. SUPER = NC

PLAN
1"=100' 0 50 100

AUTH	DATE	NO.	REVISION
			FINAL R.O.W.

URS
Surface Transportation
Grand Rapids - Southfield - Traverse City

CITY OF NOVI

CITY OF NOVI RING ROAD PHASE 1

VICINITY SHEET

JOB NO. 12941940

DATE 06/07/11

SHEET NO. 2

DATE: 06/07/11

WORKED ON BY: TRW

CHECKED BY: SNK

FILE NAME: 41940.VIC