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Vision That Moves Your Community

February 16, 2012

Mr. Glenn Brown, P.E.
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675 Hartz Avenue, Suite 202
Danville, CA 94526-3838

Via e-mail only: Gbrown@integralcommunities.com

Subject: Comparative Trip Generation Analysis for Proposed McCandless Mixed Use Development in the City of Milpitas

Dear Glenn:

In response to your request, TJKM is pleased to provide a trip generation comparison for the proposed McCandless Mixed Use Development at Great Mall Parkway and McCandless Drive in the City of Milpitas. A detailed final traffic impact study dated November 4, 2011 was completed for a proposed mixed use development consisting of a maximum 1,328 residential units on eight parcels, as well as up to 92,000 square feet of commercial retail within the four northernmost parcels closest to Great Mall Parkway. The November traffic study report stated that of the 1,328 residential units, 919 would consist of multifamily units within multi-level podium buildings that include ground floor retail on the four northernmost parcels (now known as District 1). The remaining 409 residential units would consist of two- and three-story townhomes on the southernmost parcels (now known as District 2).

It is now our understanding that the project size has decreased in terms of the residential unit count in both Districts 1 and 2. Specifically, District 1 would consist of 955 multifamily units and District 2 would consist of 200 townhome units. Commercial retail quantities for the site would not change. The purpose of this letter is to estimate the expected trip generation for the revised project size and determine whether the decrease in residential units from the November traffic study would have any differential traffic impacts.

Revised Project Trip Generation

TJKM developed expected trip generation for the revised project proposal based on San Diego Association of Governments (SANDAG) trip generation rates contained in the Milpitas Transit Area Specific Plan (TASP), as well as residential rates consistent with a recent TASP development traffic study in the Piper-Montague subarea as directed by City staff. These rates are consistent with those used in the November traffic study. Also consistent with the November study, TJKM additionally applied trip discounts to the proposed project trip generation that are consistent with the Milpitas TASP and Santa Clara Valley Transportation Authority (VTA) Traffic Analysis Guidelines in terms of development densities, residential-retail mixed use internal trip capture, retail pass by, and proximity to rail transit.

Table 1 shows the expected revised project trip generation for typical weekday daily, a.m. peak hour, and p.m. peak hour periods based on the current development proposal. According to the table, the revised mixed-use development that now includes 1,155 total residential units is expected to generate approximately 8,761 daily trips, including 605 a.m. peak hour trips (180 inbound and 425 outbound), and 786 p.m. peak hour trips (506 inbound and 280 outbound) after all applicable trip discounts are applied.

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The above expected project trip totals are lower than the trips generated by the proposed project assumed in the November traffic study that includes 1,328 residential units. In that study, the project was expected to generate approximately 9,707 daily trips, including 676 a.m. peak hour trips (194 inbound and 482 outbound), and 872 p.m. peak hour trips (568 inbound, 304 outbound) after all applicable trip discounts are applied.

Table I: Proposed Project Weekday Trip Generation (with 1,155 total dwelling units)

Building / Neighborhood	Land Use	Size	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
				In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips
1	Multi-Family Residential	373 du	2,238	36	143	179	141	60	201
	Regional Shopping Center	60 ksf	3,000	84	36	120	135	135	270
2	Multi-Family Residential	218 du	1,308	21	84	105	82	35	117
	Regional Shopping Center	5 ksf	250	7	3	10	11	11	22
3	Multi-Family Residential	190 du	1,140	18	73	91	72	31	103
	Regional Shopping Center	22 ksf	1,100	31	13	44	50	50	100
4	Multi-Family Residential	174 du	1,044	17	67	84	66	28	94
	Regional Shopping Center	5 ksf	250	7	3	10	11	11	22
N1	Multi-Family Residential	119 du	714	12	46	58	45	20	65
N2	Multi-Family Residential	81 du	486	8	31	39	30	13	43
Totals (Undiscounted)			**11,530**	**241**	**499**	**740**	**643**	**394**	**1,037**
Discounts									
13% Housing-Retail Mixed Use (for Retail – Parcels 1,2,3,4)			*-599*	*-17*	*-7*	*-24*	*-27*	*-27*	*-54*
13% Housing-Retail Mixed Use (for Residential – all parcels)			*-599*	*-7*	*-17*	*-24*	*-27*	*-27*	*-54*
25% Pass By (for Retail)			*-1,000*	*-29*	*-13*	*-42*	*-46*	*-46*	*-92*
9% Fixed Rail (for Residential)			*-571*	*-8*	*-37*	*-45*	*-37*	*-14*	*-51*
Totals (With Discounts)			***8,761***	***180***	***425***	***605***	***506***	***280***	***786***

Sources: Milpitas Transit Area Specific Plan (2007), San Diego Traffic Generators (2002), TJKM (2011)

Notes: 1. du = dwelling units, ksf = 1,000 square feet, N1/N2 = Townhome Neighborhoods 1 and 2.
2. Parcels 1 through 4 located in District 1, while Neighborhoods 1 and 2 located in District 2.
3. The following trip discounts consistent with the TASP and VTA Traffic Analysis Guidelines were applied:
   a) Parcels 1 through 4 include 13 percent discount for internal trip matching between housing and retail within each individual project parcel.
   b) Neighborhoods 1 and 2 include 13 percent discount for internal trip matching between housing on Neighborhoods 1 and 2 and retail on Parcels 1 through 4.
   c) Parcels 1 through 4 include 25 percent retail pass by trip reduction.
   d) Parcels 1 through 4 and Neighborhoods 1 and 2 include 9 percent fixed-rail reduction for housing due to proximity with VTA Light Rail stations and/or future Montague BART Station.

It is important to note that since the current project proposal is expected to generate fewer trips than originally reported in the November study, the November study now represents a conservative (over)estimate of project-generated traffic. Therefore, traffic impacts are accordingly expected to be reduced based on the current project proposal. Furthermore, it should also be noted that all transportation improvements recommended in the November study would have the same effectiveness under the current project proposal.

Thank you for the opportunity to provide this analysis. Please do not hesitate to contact me with your questions or comments.

Sincerely,

Andrew R. Kluter

Andrew Kluter, P.E.
Project Manager

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ATTACHMENT F

TJKM
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Final Report

Traffic Operations Analysis for McCandless Development

In the City of Milpitas

November 4, 2011

Pleasanton
Fresno
Sacramento
Santa Rosa

TJKM

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Introduction and Summary

Introduction

This report presents the results of TJKM's traffic operations analysis for the proposed mixed-use McCandless Development in the City of Milpitas. This proposed project is located along McCandless Drive between Great Mall Parkway and the Penitencia Creek East Channel within the Milpitas Transit Specific Plan Area. Project access is proposed from both Great Mall Parkway and McCandless Drive.

The purpose of this traffic analysis is to evaluate the potential traffic operational effects of the proposed project, which consists of a maximum 1,328 residential units on eight parcels and also up to 92,000 square feet of commercial retail within the four northernmost parcels closest to Great Mall Parkway. Of the 1,328 residential units, 919 would consist of multifamily units within multi-level podium buildings that include ground floor retail on the four northernmost parcels. The remaining 409 residential units would consist of two- and three-story townhomes on the southernmost parcels. Figure 1 illustrates the location of the proposed project and its vicinity. Figure 2 shows the proposed McCandless Development site plan.

This report includes analysis of five study scenarios and 11 study intersections (nine existing and two project-only) that would potentially be affected by proposed project traffic. For the purposes of this analysis, potential traffic operational effects from the McCandless Development are identified based on established traffic operational thresholds for the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program (CMP) and the City of Milpitas. For study intersections exceeding these thresholds, transportation improvements are then identified and evaluated for the potential to bring overall level of service (LOS) back within acceptable thresholds.

Summary

Project Trip Generation

The proposed McCandless Development is expected to generate a net of 9,707 daily vehicle trips, including 676 during the a.m. peak hour and 872 during the p.m. peak hour, after applying all applicable trip discounts.

Existing Conditions

Currently, all study intersections operate at acceptable LOS based on applicable jurisdictional standards during both weekday a.m. and p.m. peak hours.

Background Conditions

All intersections are expected to continue to meet acceptable LOS standards, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during a.m. peak hour)

Background plus Project Conditions

All intersections are expected to continue operating under acceptable jurisdictional standards as under Background Conditions, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, with increased average delay beyond four seconds. With the prescribed Milpitas Transit Area Specific Plan (TASP) improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, the TASP notes that this improvement may not be feasible due to potential bridge widening costs. City staff have stated that a fair share contribution should be made for future signal timing / traffic management improvements at this intersection.
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour). However, since average delay during the a.m. peak hour is expected to increase by fewer than four seconds (1.7), the applicable LOS threshold is not exceeded and a transportation improvement would not be required.
- Great Mall Parkway / S. Abel Street – intersection operations are expected to change from LOS D to E with the addition of project traffic during both peak hours. An improvement of adding an eastbound right turn lane and southbound right turn lane is expected to improve operations to LOS D during both peak hours. However, it should be noted that this improvement is not listed as a TASP mitigation and may not be feasible due to the proximity of a residential subdivision in the southwest quadrant.
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours). During the a.m. peak hour, the baseline LOS F condition is expected to continue, with increased average delay beyond four seconds. During the p.m. peak hour, service levels are expected to increase from LOS E to F. The Milpitas TASP Environmental Impact Report (EIR) identified a grade-separated urban interchange as the only feasible improvement at this intersection. However, the EIR states that this improvement is not fully funded.

An evaluation of 95th percentile (maximum) queue lengths under Background plus Project Conditions on City roadways directly serving the project site revealed that the following existing turn pockets are expected to have vehicle queues exceeding existing vehicle storage lengths with the addition of project traffic:

- Great Mall Parkway / McCandless Drive – westbound left turn. Extending the current vehicle storage length from 230 to 370 feet is expected to accommodate the maximum expected vehicle queue and can be constructed within the existing Great Mall Parkway median.
- Montague Expressway / McCandless Drive / Trade Zone Boulevard – eastbound left turn. Extending the current vehicle storage length from 200 to 350 feet is expected to accommodate the maximum expected vehicle queue and can be constructed within the existing Montague Expressway median.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

2030 Baseline Conditions

All intersections are expected to continue to meet acceptable LOS standards, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
- Great Mall Parkway / S. Abel Street (LOS F during a.m. peak hour, LOS E during p.m. peak hour)
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours)
- Montague Expressway / McCandless Drive / Trade Zone Boulevard (LOS F during p.m. peak hour)

2030 plus Project Conditions

All intersections are expected to continue operating acceptably, with the following exceptions:

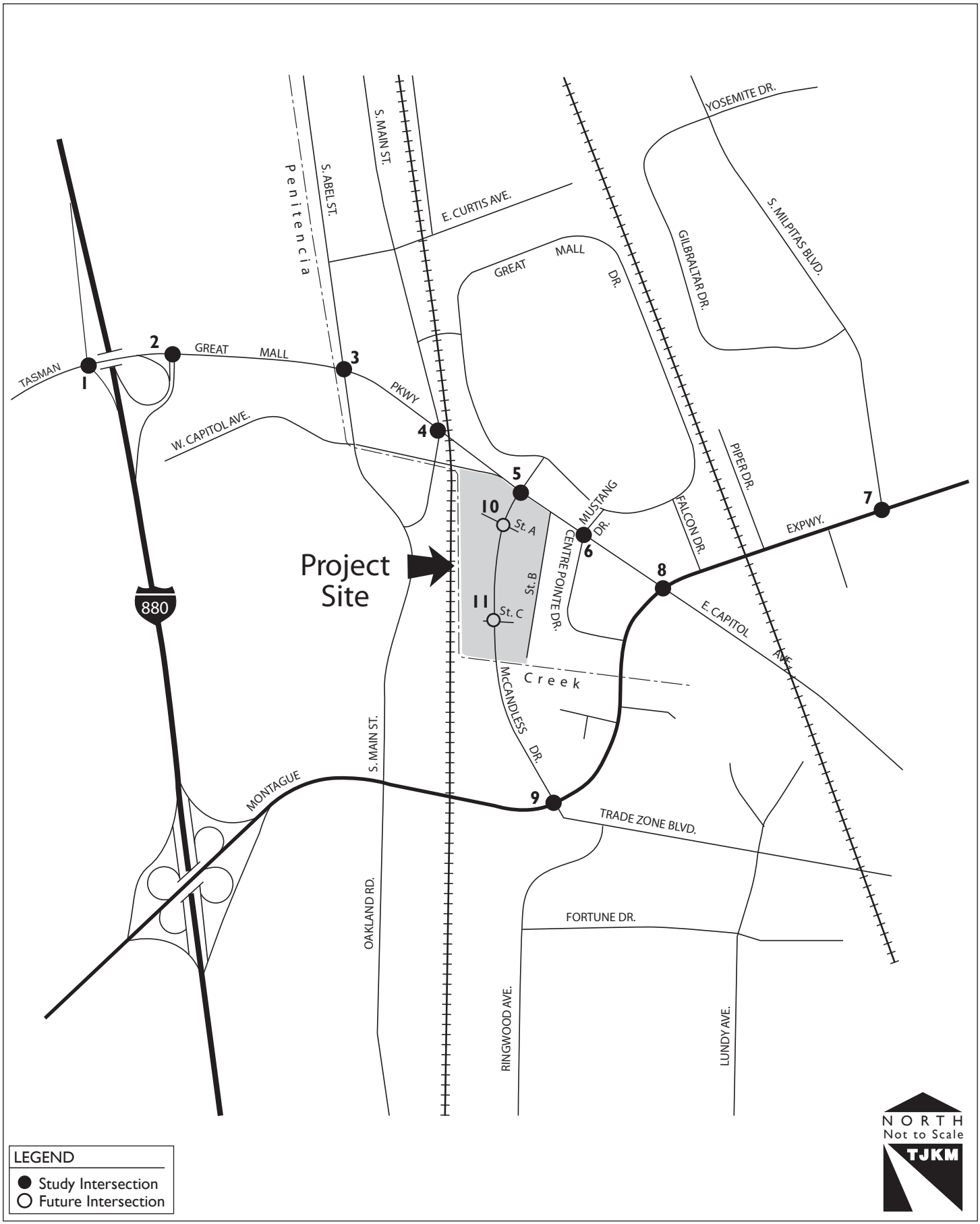
- I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds. With the prescribed Milpitas TASP improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, the TASP indicates this improvement may not be feasible due to potential bridge widening costs. City staff have stated that a fair share contribution should be made for future signal timing / traffic management improvements at this intersection.
- I-880 Northbound Ramps / Tasman Drive - LOS F during a.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvements are required.
- Great Mall Parkway / S. Abel Street - LOS F during a.m. peak hour and LOS E during p.m. peak hour, just as under 2030 Baseline Conditions, with increased average delay greater than four seconds during the p.m. peak hour. An improvement of adding one eastbound right turn lane, one southbound right turn lane, and one northbound left turn lane is expected to improve operations to LOS D during both peak hours. However, it should be noted that this improvement is not listed as a TASP mitigation and may not be feasible due to the proximity of a residential subdivision in the southwest quadrant. Montague Expressway / Great Mall Parkway / E. Capitol Avenue - LOS F during both peak hours, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds for both the a.m. and p.m. peak hours. A proposed grade-separated urban interchange is the only TASP-identified feasible improvement at this intersection, but is not fully funded.
- Montague Expressway / McCandless Drive / Trade Zone Boulevard - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvements are required.

An evaluation of 95th percentile (maximum) queue lengths under 2030 plus Project Conditions on city roadways directly serving the project site revealed that the same existing turn pockets identified under Background plus Project Conditions are expected to experience spillover conditions with the addition of project traffic. The same improvements identified under Background plus Project Conditions are expected to accommodate the maximum queues expected under 2030 plus Project Conditions.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

City of Milpitas - Traffic Operations Analysis for McCandless Development
Vicinity Map

Figure 1



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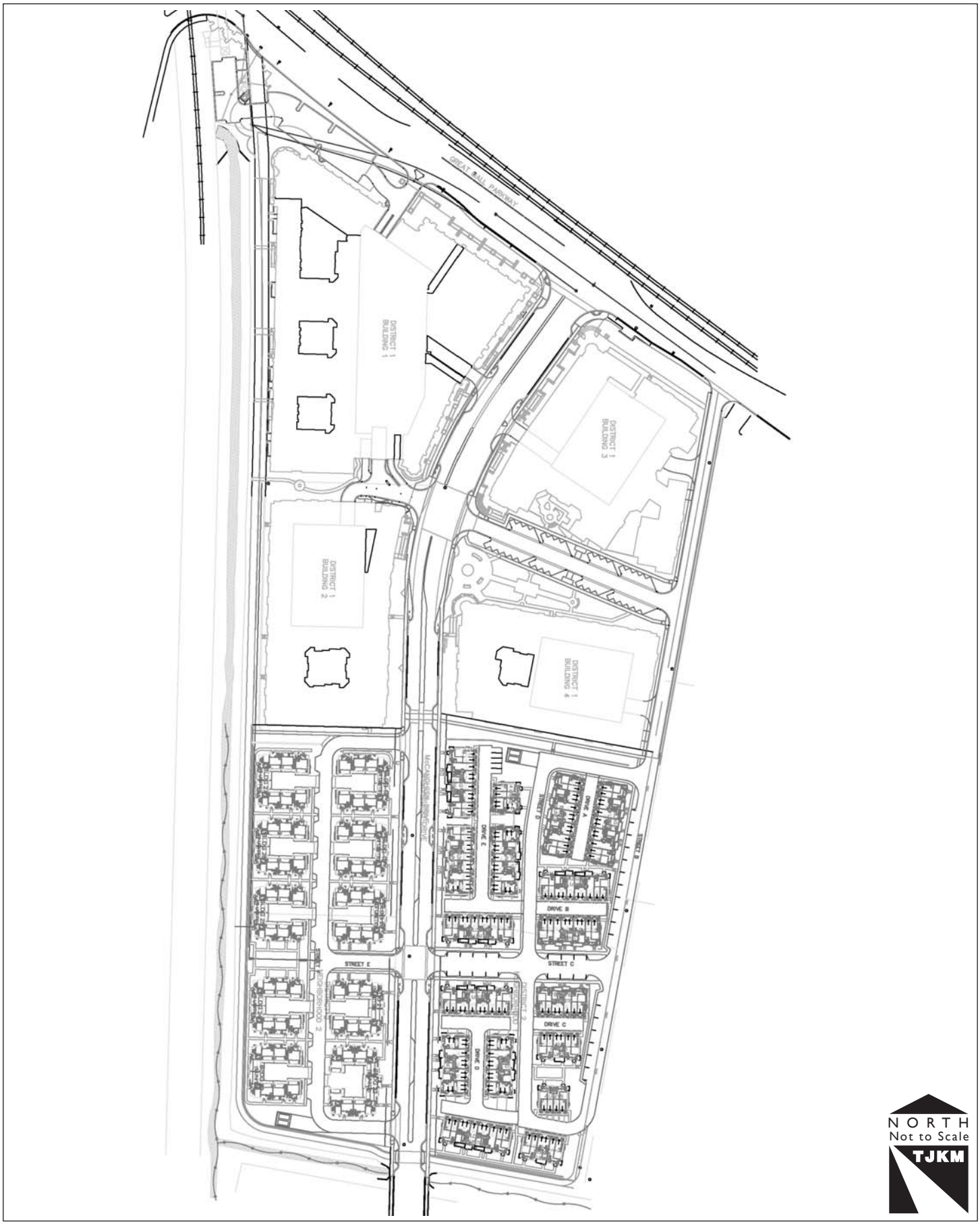
Project Site Plan

Figure 2



Level of Service Analysis Methodology

Level of service is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The level of service generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience and safety. The operational levels of service (LOS) are given letter designations from "A" to "F," with "A" representing the best operating conditions (free-flow) and "F" the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets.

Signalized Intersections

The study intersections under traffic signal control were analyzed using the Highway Capacity Manual 2000 (HCM 2000) Operations Method contained in the standard traffic software Synchro. This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. LOS "A" indicates free flow conditions with little or no delay, while LOS "F" indicates jammed conditions with excessive delay and long back-ups. The methodology is described in detail in Appendix A.

Unsignalized Intersections

The operating conditions at the study intersections with minor stop-controlled approaches (one-way or two-way) were evaluated using the HCM 2000 Unsignalized Methodology, also contained in Synchro. For two-way stop controlled intersections, LOS is based on and reported for the worse of the two minor approaches. For all-way stop controlled intersections, LOS is based on the average control delay experienced on all approaches. The methods rank level of service on an "A" through "F" scale (similar to that used for signalized intersections) to describe travel delay and congestion. The methodologies for unsignalized intersections are also presented in Appendix A.

Level of Service Threshold Criteria

All study intersections fall within City of Milpitas jurisdiction but are subject to different traffic operational standards depending on whether they are monitored as part of the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program (CMP). CMP and non-CMP standards for the study intersections are described below.

Santa Clara County CMP Intersections

The intersection operational standard is LOS E for VTA CMP intersections located within the City of Milpitas. Exceedance of this LOS threshold at CMP intersections would occur when the addition of traffic associated with implementation of a proposed project causes:

- Intersection operations to deteriorate from an acceptable level (LOS E or better) under Background Conditions to an unacceptable level (LOS F); or
- Exacerbation of unacceptable operations by increasing the average critical delay by more than four (4) seconds and increasing the critical volume-to-capacity (V/C) ratio by 0.01 or more at an intersection operating at LOS F under the Current Precise Plan Conditions.
- An increase in the V/C ratio of 0.01 or more at an intersection with unacceptable LOS F operations when the change in critical delay is negative (i.e., decreases). This can occur if the critical movements change.

City of Milpitas (Non-CMP) Intersections

LOS D is the standard for non-CMP intersections within City of Milpitas jurisdiction. For purposes of this study, the critical minor approach of unsignalized City non-CMP intersections will be evaluated with a LOS D standard. Such intersections exceeding this threshold will be evaluated for potential transportation improvements.

Study Traffic Analysis Scenarios

The study evaluated traffic operational conditions under the following five (5) analysis scenarios:

1. *Existing Conditions* – this scenario is based on existing 2010 roadway conditions and traffic counts collected as part of the ongoing Milpitas Signal Timing Project as directed by City staff.
2. *Background (Existing plus Approved Project) Conditions* – this scenario is similar to Existing Conditions, but with the addition of approved project trips identified in the Milpitas Transit Area Specific Plan (TASP) assigned to the study intersections.
3. *Background plus Proposed Project Conditions* – this scenario is identical to Background Conditions, but includes additional traffic expected to be generated by the proposed mixed-use McCandless Development, which consists of a maximum 1,328 residential units of varying type and density on eight parcels, as well as approximately 92,000 square feet of commercial retail within the four northernmost parcels closest to Great Mall Parkway.
4. *Year 2030 Baseline Conditions* – this scenario estimates Year 2030 traffic conditions based on roadway link traffic volumes and land use projections documented in the Milpitas TASP. Because the TASP traffic analysis analyzes only 2030 roadway link volumes, growth factors based on these link volumes were developed to estimate expected 2030 vehicle turning movement volumes at the study intersections. This scenario assumes background traffic associated with full build of the TASP, but without traffic generated by the proposed McCandless Development.
5. *Year 2030 plus Proposed Project Conditions* - this scenario is identical to Year 2030 Baseline Conditions, but includes additional traffic expected to be generated by the proposed McCandless Development.

Study Intersections

The study focused on evaluating traffic conditions at 11 study intersections that the proposed project may potentially affect (see Figure 1), selected in consultation with City of Milpitas staff. The study intersections and their associated traffic controls are:

1. I-880 Northbound Ramps / Tasman Drive (Signal)
2. I-880 Southbound Ramps / Tasman Drive (Signal)
3. Great Mall Parkway / S. Abel Street (Signal)
4. Great Mall Parkway / S. Main Street (Signal)
5. Great Mall Parkway / McCandless Drive (Signal)
6. Great Mall Parkway / Centre Pointe Drive (Signal)
7. Montague Expressway / S. Milpitas Boulevard (Signal)
8. Montague Expressway / Great Mall Parkway / E. Capitol Avenue (Signal)
9. Montague Expressway / McCandless Drive / Trade Zone Boulevard (Signal)
10. McCandless Drive / Street "A" (Retail/Residential Project Driveway just south of Great Mall Parkway)
11. McCandless Drive / Street "C" (Residential Neighborhoods 1 and 2 Project Access). Note that this access has been designated Street "C" solely for purposes of this traffic study.
12. Great Mall Parkway / Retail Driveway (Project Intersection, Right-In/Right-Out, One-Way Stop)
13. Great Mall Parkway / Street "B" (Project Intersection, Right-In/Right-Out, One-Way Stop)

Existing Conditions

Existing Roadway System and Setting

Regional access to the proposed McCandless Development site is provided by Interstate 880 (I-880), I-680, State Route 237 (SR 237), Montague Expressway, Great Mall Parkway / Tasman Drive, Trade Zone Boulevard and Capitol Avenue. McCandless Drive provides local access to the project site, with a northern connection to Great Mall Parkway at the primary Great Mall entrance and a southern connection to Montague Expressway and Trade Zone Boulevard. The primary facilities providing regional and local access are described in greater detail below.

I-880 is a north-south freeway located west of the project site. This freeway extends south to the City of San Jose and north to the City of Oakland. Near the proposed project, the freeway consists of six lanes and provides local interchange connections at Great Mall Parkway / Tasman Drive and Montague Expressway. The I-880/SR 237 interchange is a major interchange to the north that provides additional regional access to northern and western Santa Clara County.

I-680 is a north-south freeway located east of the project site. This freeway extends south to the City of San Jose and north to Solano County. Near the project site, the freeway consists of eight mixed-flow lanes. Further north, I-680 consists of six mixed-flow lanes plus a southbound high-occupancy toll (HOT) lane north of Calaveras Boulevard (SR 237). Local interchange connections near the proposed project site are provided at Montague Expressway and Capitol Avenue. I-680 southbound is the primary commute direction during the a.m. peak hour, while northbound is the primary commute direction during the p.m. peak hour.

Montague Expressway is an east-west, six- to eight-lane divided expressway operating by Santa Clara County, which runs between the U.S. 101 freeway to the east and I-680 to the west. The roadway provides limited access to fronting land uses, with primary access via signalized intersections that include signal timing optimized for expressway traffic progressions. Through the study area, Montague Expressway intermittently includes directional high-occupancy vehicle (HOV) lanes (right side curb lane) during peak periods (westbound during the a.m. commute peak period and eastbound during the p.m. peak period). Montague Expressway connects with I-880 and I-680 via full cloverleaf interchanges.

Great Mall Parkway is an east-west, six-lane divided arterial roadway extending from I-880 easterly to Montague Expressway. It forms the northern project site boundary. Great Mall Parkway also bisects the Planning Area. Great Mall Parkway is designated as Tasman Drive west of I-880, providing a connection to the Cities of San Jose, Santa Clara, and Sunnyvale. Great Mall Parkway becomes Capitol Avenue east of Montague Expressway, connecting by interchange to I-680 and continuing southerly through the City of San Jose. Santa Clara Valley Transportation Authority (VTA) light-rail transit (LRT) service is provided along the median of Great Mall Parkway in the project vicinity in an aerial viaduct, stopping near the project site at Great Mall / Main and Montague Stations.

Main Street is a north-south, two- to four-lane arterial roadway parallel to Abel Street extending from Railroad Avenue (north of SR 237 / Calaveras Boulevard) south to Montague Expressway. This roadway, located west of the proposed project site, is designated as Oakland Road south of Montague Expressway. Main Street includes two lanes north of Curtis Avenue and four lanes with a two-way left-turn lane and bicycle lanes south of Curtis Avenue.

Abel Street is a north-south, four-lane arterial roadway extending from Milpitas Boulevard (north of SR 237 / Calaveras Boulevard) south to Main Street (south of Great Mall Parkway). This roadway is located west of the proposed project site. The section of Abel Street between Corning and Curtis Avenues includes four travel lanes plus a two-way left-turn lane.

Milpitas Boulevard is a north-south, four-lane arterial roadway extending from the Milpitas-Fremont City limit line southerly to Montague Expressway, where it terminates east of the proposed project site. Milpitas Boulevard is designated Warm Springs Boulevard north of the City/County limit.

Trade Zone Boulevard is an east-west, four-lane minor arterial roadway located south of the proposed project site. It forms the south leg of the Montague Expressway / McCandless Drive study intersection, providing the southern gateway to the project site.

Centre Pointe Drive is a northwest-southeast, two-lane collector roadway connecting Great Mall Parkway with Montague Expressway. The roadway is located immediately east of the proposed project site and forms the south leg of the Great Mall Parkway / Centre Pointe Drive / Mustang Drive intersection, which serves as an entrance to the Great Mall.

McCandless Drive is a north-south, two-lane collector roadway that currently includes a two-way left-turn lane through the project area. It will provide primary local project access to Great Mall Parkway and Montague Expressway. The Great Mall Parkway / McCandless Drive intersection provides the primary entrance to the Great Mall.

Existing Transit Service

The proposed McCandless Development site is very well served by public transportation. The Santa Clara Valley Transportation Authority (VTA), which operates bus and light rail service within Santa Clara County, runs multiple transit routes through the study area. The Great Mall / Main Transit Center (TC) is located within one-quarter mile walking distance of the proposed project site, on the north side of Great Mall Parkway east of Main Street. This multimodal transit hub consists of an elevated light rail transit (LRT) station above Great Mall Parkway, as well as a bus transfer facility and park-and-ride lot located on the northeast corner of the Great Mall Parkway / Main Street intersection. A second LRT station (Montague) is located approximately one-half mile east of the proposed project site and is elevated above Capitol Avenue. No bus or park-and-ride facilities are provided at this second station.

The Great Mall / Main TC and project study area are served by VTA bus routes 46, 47, 66, 70, 71, 77, 104, 140, 180, 181, and 321, as well as AC Transit route 217. In addition, the Altamont Commuter Express (ACE) Violet Shuttle (Route 831) runs through the study area along Montague Expressway south of the proposed project site. Table I summarizes the destinations, days and hours of operation, and service headways for the bus routes and LRT line.

Table I: Existing Transit Service Within Study Area

Route	From	To	Weekdays			Weekends	
			Operating Hours	Peak Hdwys	Midday Hdwys	Operating Hours	Midday Hdwys
LRT	Santa Teresa	Alum Rock	4:20a – 2:15a	15	15	5:05a – 2:15a	15
46	Great Mall/Main TC	Washington / Escuela	5:50a – 8:20p	30	30-60	8:50a – 6:15p	60
47	Great Mall/Main TC	McCarthy Ranch	6:25a – 9:50p	30	30	8:05a – 8:10p	30
66	Kaiser San Jose	Milpitas / Dixon Road	5:15a – 12:05a	15	15-20	5:35a – 12:05a	15-20
70	Capitol LRT Station	Great Mall / Main TC	5:20a – 11:25p	15	15	6:15a – 11:25p	20
71	Eastridge TC	Great Mall / Main TC	5:35a – 10:25p	15-20	15-30	7:15a – 9:25p	30
77	Eastridge TC	Great Mall / Main TC	5:20a – 9:50p	15-20	20	6:40a – 8:30p	30
104	Penitencia Creek Sta.	Palo Alto	5:55a – 7:50a 3:15p – 5:50p	45-70	–	No Service	–
180	Fremont BART Station	Great Mall / Main TC	5:45a – 10:05p	30	30	No Service	–
181	Fremont BART Station	San Jose Diridon TC	5:25a - 12:45a	15	30	7:10a - 12:45a	
217*	Fremont BART Station	Great Mall / Main TC	5:15a – 10:55p	30	30	7:00a – 7:55p	40
321	Great Mall/Main TC	Lockheed Martin	8:10a – 8:45a 5:45p – 6:27p	1 run/ peak	–	No Service	–
831	Great America ACE/ Amtrak Station	Lundy / Commerce	6:15a – 9:10a 3:05p – 5:35p	60-75	–	No Service	–

Notes: *Route 217 = AC Transit Route. All other routes operated by VTA.
Hdwys = Headways

Existing Bicycle Access

Bicycle facilities are classified in three ways: off-street paths separated from auto traffic (Class I), on-street striped lanes (Class II), and on-street signed routes in which bicycles share the roadway with other vehicles (Class III). Currently, Class II bicycle lanes are provided on Great Mall Parkway, Main Street, McCandless Drive, and Capitol Avenue south of Trimble Road within the project study area. Presently, there are no Class I bicycle paths or Class II bicycle routes designated within the project study area.

Existing Traffic Volumes

Traffic Data Service (TDS) collected existing vehicle, bicycle, and pedestrian turning movement counts in October 2010 during weekday a.m. and p.m. peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively) at all study intersections except the three intersections along Montague Expressway. For the Montague Expressway study intersections at Trade Zone Boulevard, Great Mall Parkway / E. Capitol Avenue, and S. Milpitas Boulevard, Santa Clara County staff provided existing vehicle turning movement counts that were taken during the p.m. peak hour only in September 2010. Based on discussion with City staff, in order to estimate existing a.m. peak hour turning movement volumes at the Montague intersections, TJKM multiplied the 2010 p.m. peak hour counts at those locations by a ratio of a.m. to p.m. peak hour counts taken in 2005 as part of the Milpitas Transit Area Specific Plan traffic analysis. Peak hour traffic count data sheets for the other eight study intersections are included in Appendix B.

Intersection Level of Service Analysis Results (Existing Conditions)

Figure 3 shows the existing peak hour intersection vehicle turning movement counts at the study intersections, as well as current lane configurations and traffic controls. Table II summarizes the results of the intersection analysis under Existing Conditions. Detailed LOS calculations are contained in Appendix C. Currently, all study intersections are operating at acceptable LOS during both weekday a.m. and p.m. peak hours.

Table II: Intersection Levels of Service – Existing Conditions

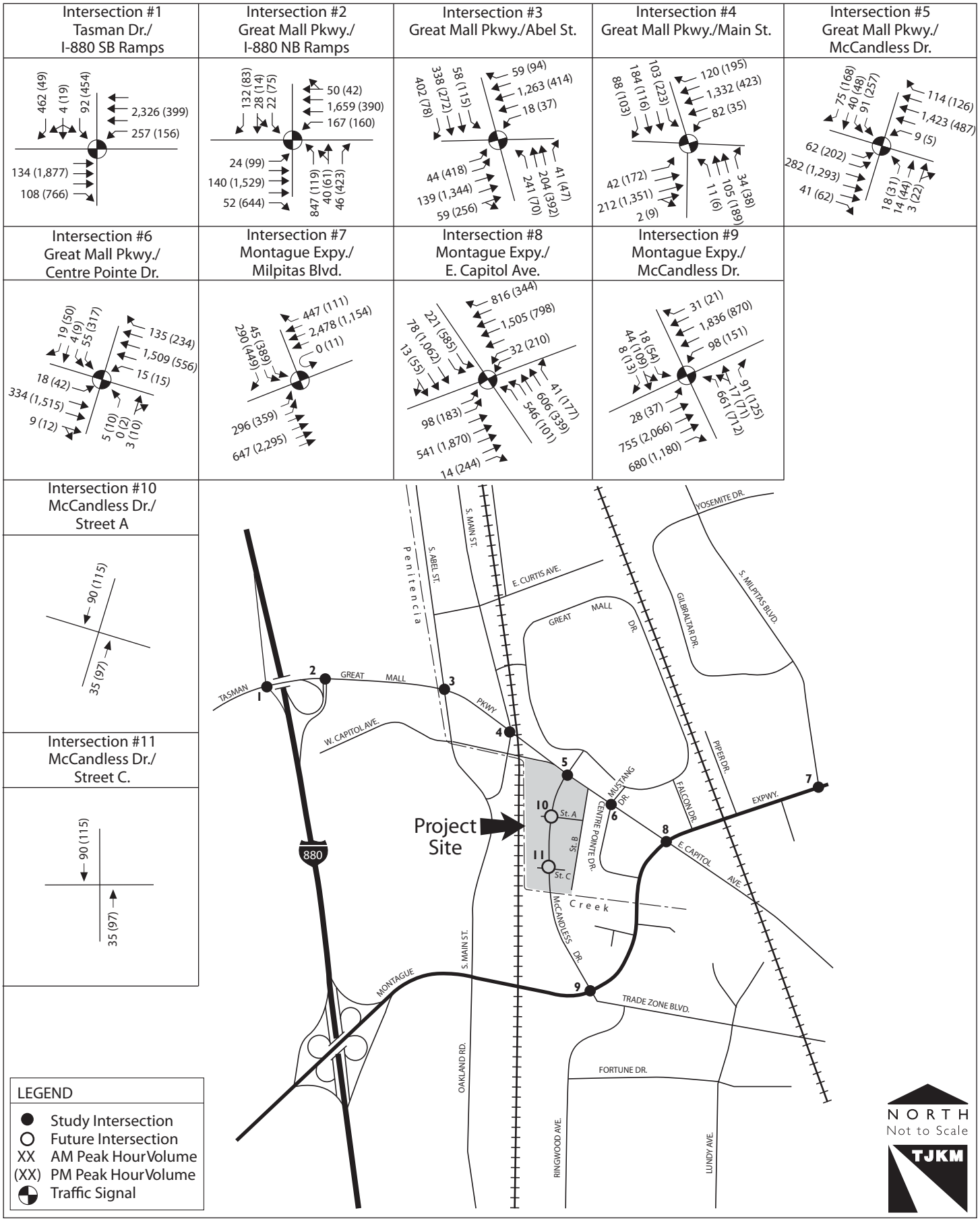
ID	*Intersection*	*Control*	*Existing Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*
1	I-880 Southbound Ramps / Tasman Drive	Signal	14.4	B	20.2	C
2	I-880 Northbound Ramps / Tasman Drive	Signal	42.2	D	22.9	C
3	Great Mall Parkway / S. Abel Street	Signal	37.0	D	29.2	C
4	Great Mall Parkway / S. Main Street	Signal	27.2	C	31.9	C
5	Great Mall Parkway / McCandless Drive	Signal	15.5	B	22.7	C
6	Great Mall Parkway / Centre Pointe Drive	Signal	9.3	A	17.3	B
7	Montague Expressway / S. Milpitas Boulevard	Signal	15.3	B	21.6	C
8	Montague Expressway / Great Mall Parkway / E. Capitol Avenue	Signal	50.2	D	45.0	D
9	Montague Expressway / McCandless Drive / Trade Zone Boulevard	Signal	32.9	C	45.0	D

Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

City of Milpitas – Traffic Operations Analysis for McCandless Development

Existing Conditions Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 3



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Background (Existing plus Approved Project) Conditions

This section details expected traffic conditions at the study intersections under Background Conditions. This analysis scenario is similar to Existing Conditions, but with the addition of vehicle trips generated by approved but not yet constructed projects as identified in the Milpitas Transit Area Specific Plan (TASP). Under this scenario, current land uses on the McCandless Development parcels are assumed. This scenario serves as a baseline for determining any exceedance of LOS thresholds with respect to the expected McCandless Development traffic. Analysis of this scenario is consistent with both City of Milpitas and VTA transportation impact analysis guidelines.

Background Development Assumptions and Traffic Estimates

Traffic volumes at the study intersections under Background Conditions were estimated by adding approved project trips from the TASP to Existing Conditions (2010) traffic volumes. A list of approved projects within Milpitas city limits is provided in the TASP. Traffic generation expected from Phase 1 of the North San Jose Development Plan is included under this scenario.

Vehicle trips from TASP approved projects were assigned according to the trip distribution assumptions contained in the TASP Draft Environmental Impact Report (DEIR) and are shown in Figure 4. These assigned trips were added to Existing Conditions traffic volumes to generate Background Conditions traffic volumes. The resulting turning movement volumes, traffic controls, and lane geometries anticipated for the study intersections under Background Conditions are shown in Figure 5. The intersection traffic controls and lane geometries are based on the anticipated TASP roadway improvements under Background Conditions that are listed below.

Background Roadway Network and Improvement Assumptions

Under Background Conditions, several transportation improvements are assumed to be in place. According to the 2009 Comprehensive County Expressway Planning Study, Santa Clara County has identified the following improvements for Montague Expressway through the project study area:

- Convert the HOV lane on the six-lane portion between I-880 and I-680 to mixed-flow operations due to operational and safety problems. This project has been completed.
- Widen to eight lanes from Mission College to I-680 and to six lanes from I-680 to Park Victoria, including various intersection at-grade improvements and I-880 and I-680 interchange work. It is anticipated that right-of-way acquisition would be required to accommodate the proposed roadway widening. A Final Environmental Assessment/Initial Study was adopted in September 2002, and according to the 2009 Expressway Study, this improvement is partially completed and partially funded. It should be noted that the City of Milpitas recently completed widening Montague Expressway to four lanes per direction between Great Mall Parkway and Milpitas Boulevard, which was outside the scope of the County's planned Montague Expressway Improvement Project.

In addition, the Milpitas TASP anticipates improvements to the following study intersections:

- Adding a fourth through lane for the westbound Montague Expressway approach at Milpitas Boulevard. This improvement is considered part of the County's Montague Expressway Improvement Project.
- At the Montague Expressway / McCandless Drive / Trade Zone Boulevard study intersection, widen the northbound (Trade Zone) approach to accommodate two left turn lanes, one through lane, and one right turn lane. Similarly, widen the southbound (McCandless) approach to accommodate the same configuration as the northbound approach.

Intersection Level of Service Analysis Results (Background Conditions)
Table III shows the results of the LOS analysis conducted for the study intersections under Background Conditions. Detailed calculation sheets are contained in Appendix D. All intersections are expected to continue operating within applicable jurisdictional standards, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during a.m. peak hour)

Table III: Intersection Levels of Service – Background Conditions

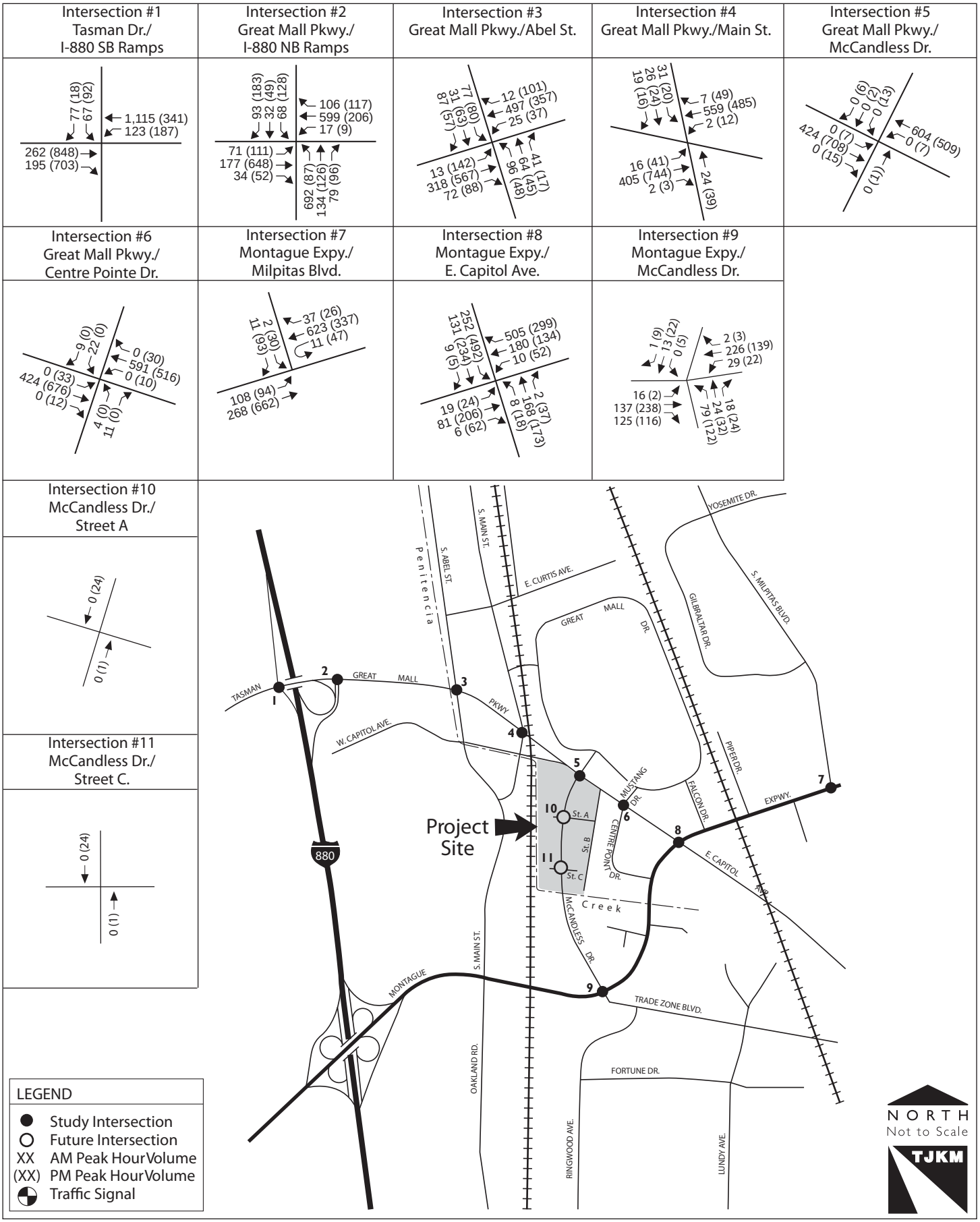
ID	*Intersection*	*Control*	*Background Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*
1	I-880 Southbound Ramps / Tasman Drive	Signal	33.6	C	**84.5**	**F**
2	I-880 Northbound Ramps / Tasman Drive	Signal	**182.7**	**F**	54.7	D
3	Great Mall Parkway / S. Abel Street	Signal	52.2	D	49.8	D
4	Great Mall Parkway / S. Main Street	Signal	31.4	C	39.6	D
5	Great Mall Parkway / McCandless Drive	Signal	15.1	B	25.2	C
6	Great Mall Parkway / Centre Pointe Drive	Signal	12.4	B	19.7	B
7	Montague Expressway / S. Milpitas Boulevard	Signal	19.4	B	23.1	C
8	Montague Expressway / Great Mall Parkway / E. Capitol Avenue	Signal	**122.7**	**F**	74.1	E
9	Montague Expressway / McCandless Drive / Trade Zone Boulevard	Signal	34.1	C	49.2	D

Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

City of Milpitas – Traffic Operations Analysis for McCandless Development

Approved Project Trip Assignment

Figure 4



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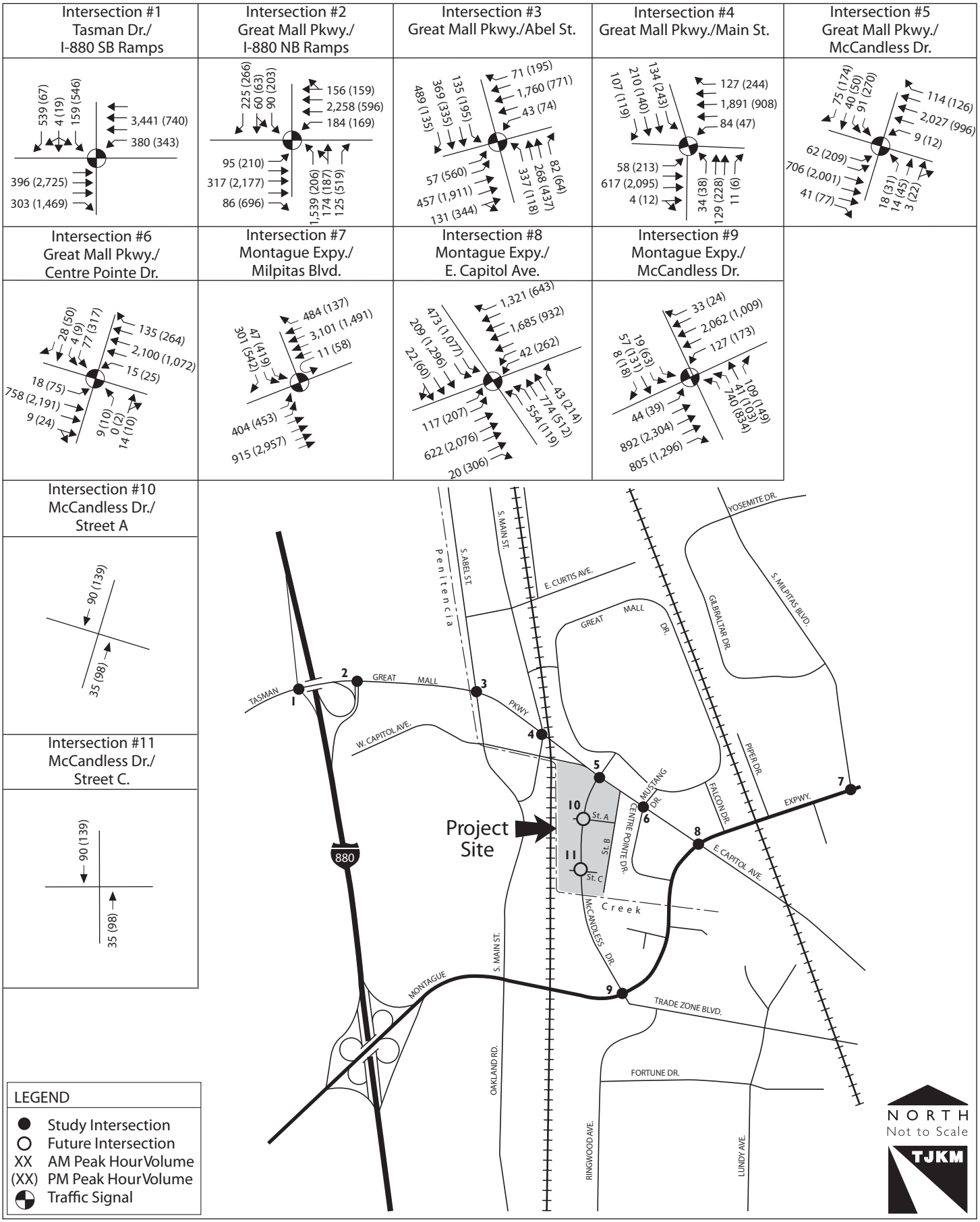
City of Milpitas – Traffic Operations Analysis for McCandless Development
Background Conditions Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 5



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Background plus Project Conditions

This analysis scenario is similar to Background Conditions, but with the addition of traffic expected to be generated by the proposed McCandless Development.

Project Location and Proposal

The proposed mixed-use McCandless Development is located within the Transit Specific Plan Area of the City of Milpitas. It is situated on eight parcels located on both sides of McCandless Drive (four on west side and four on east side) between Great Mall Parkway to the north and the Penitencia Creek East Channel to the south. The two northernmost parcels (1 and 3) are proposed to have right-in/right-out access from both Great Mall Parkway and McCandless Drive. Parcel 1 would also have full access from the proposed McCandless Drive / Street "A" intersection south of Great Mall Parkway, while Parcel 3 would have one-way outbound (westbound) access on Street "A" between McCandless Drive and the proposed Street "B". Full access for the remaining parcels will be provided from McCandless Drive. Additionally, the proposed Street "B", which would parallel McCandless Drive to the east, will provide a secondary right-in/right-out access from Great Mall Parkway for the four easternmost project parcels.

The proposed project consists of a maximum 1,328 residential units on eight parcels, as well as up to 92,000 square feet of commercial retail within the four northernmost parcels closest to Great Mall Parkway. Of the 1,328 residential units, 919 would consist of multifamily units within multi-level podium buildings that include ground floor retail on the four northernmost parcels. The remaining 409 residential units would consist of two- and three-story townhomes on the southernmost parcels.

Trip Generation – Proposed Project

TJKM developed expected trip generation for the proposed project based on San Diego Association of Governments (SANDAG) trip generation rates contained in the Milpitas TASP, as well as residential rates consistent with a recent TASP development traffic study in the Piper-Montague subarea as directed by City staff. Table IV shows the resulting trip rates used for estimating trips expected to be generated by the proposed project.

Table IV: Proposed Project Trip Rates

TASP Land Use	*Daily Rate*	*A.M. Peak Hour Rates*			*P.M. Peak Hour Rates*		
		In	*Out*	*Total*	*In*	*Out*	*Total*
Multi-Family Residential	6	0.096	0.384	0.48	0.378	0.162	0.54
Regional Shopping Center	50	1.40	0.60	2.00	2.25	2.25	4.50

Sources: Milpitas Transit Area Specific Plan (2007), Hexagon Transportation Consultants (2008), and San Diego Traffic Generators (2002).

TJKM applied trip discounts to the proposed project trip generation that are consistent with the Milpitas TASP and VTA Traffic Analysis Guidelines in terms of development densities, residential-retail mixed use internal trip capture, retail pass by, and proximity to rail transit. Table V shows the estimated trip generation for the proposed project resulting from the trip rates in Table IV and applicable trip discounts. As shown in Table V, the proposed McCandless Development is expected to generate a net of 9,707 daily vehicle trips, including 676 during the a.m. peak hour and 872 during the p.m. peak hour, after applying all applicable trip discounts.

Table V: Proposed Project Trip Generation

Parcel	Land Use	Size	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
				In Trips	Out Trips	Total Trips	In Trips	Out Trips	Total Trips
1	Multi-Family Residential	359 du	2,154	34	138	172	136	58	194
	Regional Shopping Center	60 ksf	3,000	84	36	120	135	135	270
2	Multi-Family Residential	211 du	1,266	20	81	101	80	34	114
	Regional Shopping Center	5 ksf	250	7	3	10	11	11	22
3	Multi-Family Residential	174 du	1,044	17	67	84	66	28	94
	Regional Shopping Center	22 ksf	1,100	31	13	44	50	50	100
4	Multi-Family Residential	175 du	1,050	17	67	84	66	28	94
	Regional Shopping Center	5 ksf	250	7	3	10	11	11	22
5	Multi-Family Residential	147 du	882	14	56	70	56	24	80
6	Multi-Family Residential	79 du	474	8	30	38	30	13	43
7	Multi-Family Residential	134 du	804	13	51	64	51	22	73
8	Multi-Family Residential	49 du	294	5	19	24	19	8	27
Totals (Undiscounted)			***12,568***	***257***	***564***	***821***	***711***	***422***	***1,133***
Discounts									
13% Housing-Retail Mixed Use (for Retail – Parcels 1,2,3,4)			*-599*	*-17*	*-7*	*-24*	*-27*	*-27*	*-54*
13% Housing-Retail Mixed Use (for Residential – all parcels)			*-599*	*-7*	*-17*	*-24*	*-27*	*-27*	*-54*
25% Pass By (for Retail)			*-1000*	*-29*	*-13*	*-42*	*-46*	*-46*	*-92*
9% Fixed Rail (for Residential)			*-663*	*-10*	*-45*	*-55*	*-43*	*-18*	*-61*
Totals (With Discounts)			***9,707***	***194***	***482***	***676***	***568***	***304***	***872***

Sources: Milpitas Transit Area Specific Plan (2007), San Diego Traffic Generators (2002), TJKM (2011)

Notes: 1. du = dwelling units, ksf = 1,000 square feet

2. The following trips discounts consistent with the TASP and VTA Traffic Analysis Guidelines were applied:
   a) Parcels 1 through 4 include 13 percent discount for internal trip matching between housing and retail within each individual project parcel.
   b) Parcels 5 through 8 include 13 percent discount for internal trip matching between housing on Parcels 5 through 8 and retail on Parcels 1 through 4.
   c) Parcels 1 through 4 include 25 percent retail pass by trip reduction.
   d) Parcels 1 through 8 include 9 percent fixed-rail reduction for housing due to proximity with VTA Light Rail stations and/or future Montague BART Station.

Project Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between a project site and various destinations outside the project study area. The process of trip assignment determines the various routes that vehicles would take from the project site to each destination using the calculated trip distribution.

Trip distribution assumptions for the proposed McCandless Development were based on the trip distributions contained in the Milpitas TASP. The assumed distribution percentages are as follows:

- 21 percent to/from from I-880 North
- 15 percent to/from I-680 North
- 15 percent to/from I-680 South

- 13 percent to/from I-880 South
- 12 percent to/from Tasman Drive West
- 5 percent to/from S. Milpitas Boulevard North
- 5 percent to/from Oakland Road South
- 3 percent to/from S. Main Street North
- 3 percent to/from S. Abel Street North
- 3 percent to/from Trade Zone Boulevard South
- 3 percent to/from Capitol Avenue South
- 2 percent to/from Lundy Avenue South

Project trips were assigned to the study intersections according to the above trip distribution percentages. Figure 6 shows the proposed project trip distribution percentages and resulting trip assignments at all study intersections. The assigned project trips were then added to Background Conditions traffic volumes to generate Background plus Project traffic volumes. Figure 7 shows the resulting traffic volumes at the study intersections under Background plus Project Conditions. The intersection traffic controls and lane geometries assumed under this analysis scenario are the same as under the Background Conditions analysis scenario.

Intersection Level of Service Analysis Results (Background plus Project Conditions)
The intersection LOS analysis results for both Background and Background plus Project Conditions are summarized in Table VI. Detailed calculation sheets are contained in Appendix E. All intersections are expected to continue operating acceptably as under Background Conditions, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, with increased average delay beyond four seconds.
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour). Since average delay during the a.m. peak hour is expected to increase by fewer than four seconds (1.7), the applicable LOS threshold is not exceeded, and no transportation improvement would be required.
- Great Mall Parkway / S. Abel Street – intersection operations are expected to change from LOS D to E with the addition of project traffic during both peak hours.
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours). During the a.m. peak hour, the baseline LOS F condition is expected to continue, with increased average delay beyond four seconds. During the p.m. peak hour, service levels are expected to increase from LOS E to F.

Table VI: Intersection Levels of Service – Background plus Project Conditions

ID	Intersection	Control	Background Conditions				Background plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	I-880 Southbound Ramps / Tasman Drive	Signal	33.6	C	**84.5**	**F**	35.6	D	**104.3**	**F**
	Improvement (TASP Mitigation): Add eastbound right turn lane	*Signal*	-	-	-	-	*35.5*	*C*	*65.1*	*E*
2	I-880 Northbound Ramps / Tasman Drive	Signal	**182.7**	**F**	54.7	D	**184.4**	**F**	64.9	E
3	Great Mall Parkway / S. Abel Street	Signal	52.2	D	49.8	D	**59.2**	**E**	**63.4**	**E**
	Improvement: Add eastbound right turn lane and southbound right turn lane	*Signal*	-	-	-	-	*53.3*	*D*	*41.8*	*D*
4	Great Mall Parkway / S. Main Street	Signal	31.4	C	39.6	D	32.1	C	41.7	D
5	Great Mall Parkway / McCandless Drive	Signal	15.1	B	25.2	C	25.6	C	37.8	D
6	Great Mall Parkway / Centre Pointe Drive	Signal	12.4	B	19.7	B	12.5	B	20.2	C
7	Montague Expressway / S. Milpitas Boulevard	Signal	19.4	B	23.1	C	22.0	C	23.6	C
8	Montague Expressway / Great Mall Parkway / E. Capitol Avenue	Signal	**122.7**	**F**	74.1	E	**144.9**	**F**	**85.9**	**F**
9	Montague Expressway / McCandless Drive / Trade Zone Boulevard	Signal	34.1	C	49.2	D	35.7	D	52.5	D
10	McCandless Drive / Street "A" (Project Driveway)	Two-Way Stop	Project Intersection				15.1	C	25.6	D
11	McCandless Drive / Street "C" (Project Driveway)	Two-Way Stop	Project Intersection				11.7	B	17.4	C
12	Great Mall Parkway / RIRO Retail Driveway	One-Way Stop	Project Intersection				9.3	A	10.9	B
13	Great Mall Parkway / Street "B" (RIRO Driveway)	One-Way Stop	Project Intersection				9.6	A	10.2	B

Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.
5) TASP = Milpitas Transit Area Specific Plan
6) RIRO = right-in/right-out

Intersection Transportation Improvement Measures (Background plus Project Conditions)
To address the above expected service levels exceeding LOS standards, the following transportation improvement measures are expected to be necessary:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour). With the prescribed Milpitas TASP improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, it should be noted that the TASP has indicated that this improvement may not be feasible due to potential bridge widening costs. City staff have stated that a fair share contribution should be made for future signal timing / traffic management improvements at this intersection.
- Great Mall Parkway / S. Abel Street – with an improvement of adding one eastbound right turn lane and one southbound right turn lane, service levels are expected to improve to an

acceptable LOS D during both peak hours. However, this improvement is not likely to be feasible. It should be noted that no improvements for this intersection were identified in the TASP, and this proposed improvement does not modify current signal timing plans at this intersection, which could be another solution to improve LOS to a manageable level without widening. Furthermore, this improvement would require widening two intersection approaches, which is not likely to be feasible due to the proximity of a residential subdivision in the southwest quadrant. It is also important to note that the McCandless Development's expected trip assignments through the intersection would not add to the specific turning movements proposed for additional turn lanes for this improvement.

- Montague Expressway / Great Mall Parkway / E. Capitol Avenue. The Milpitas TASP EIR identified a grade-separated urban interchange as the only feasible improvement at this intersection. However, it should be noted that according to the EIR, this improvement is not fully funded.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

Expected Vehicle Queues at City Roadway Access Points

TJKM evaluated the potential effects of added traffic from the proposed project on vehicle queue lengths for existing turn lanes on City roadways directly serving the project site. The evaluation included analysis of 95th percentile (maximum) queues expected with the addition of proposed project traffic, and results are included in Appendix E. Table VII shows expected vehicle queues for the turn pockets of project access intersections under Background plus Project Conditions. The table shows that the following existing turn pockets are expected to exceed available vehicle storage capacity with the addition of proposed project traffic:

- Great Mall Parkway / McCandless Drive – westbound left turn
- Montague Expressway / McCandless Drive / Trade Zone Boulevard – eastbound left turn

Table VII: Expected Turn Pocket Vehicle Queues – Background plus Project Conditions

Intersection and Turn Pocket	*Storage Length (feet)*	*95th Percentile Queue Length (feet)*	
		A.M. Peak Hour	*P.M. Peak Hour*
Great Mall Parkway / McCandless Drive			
Eastbound Right Turn	260	37	156
Westbound Left Turn	230	132	**385**
Improvement: Extend WB LTL from 230 to 385 feet	*385*	*132*	*385*
Northbound Left Turn	385**	343	211
Montague Expressway / McCandless Drive / Trade Zone Boulevard			
Eastbound Left Turn	200	184	**334**
Improvement: Extend EB LTL from 200 to 350 feet	*350*	*184*	*334*
Westbound Right Turn	100	- *	- *
Southbound Left Turn	180	43	37
Southbound Right Turn	200	- *	- *
McCandless Drive / Street "A" (Project Driveway)			
Northbound Left Turn	75**	2	6

Notes: 1) * = free turn, ** = proposed storage length with project
2) McCandless Drive / Street "C" (Project Driveway) - all assumed to be single-lane approaches
3) Great Mall Parkway / McCandless Drive northbound left turn queuing results based on SimTraffic simulation.

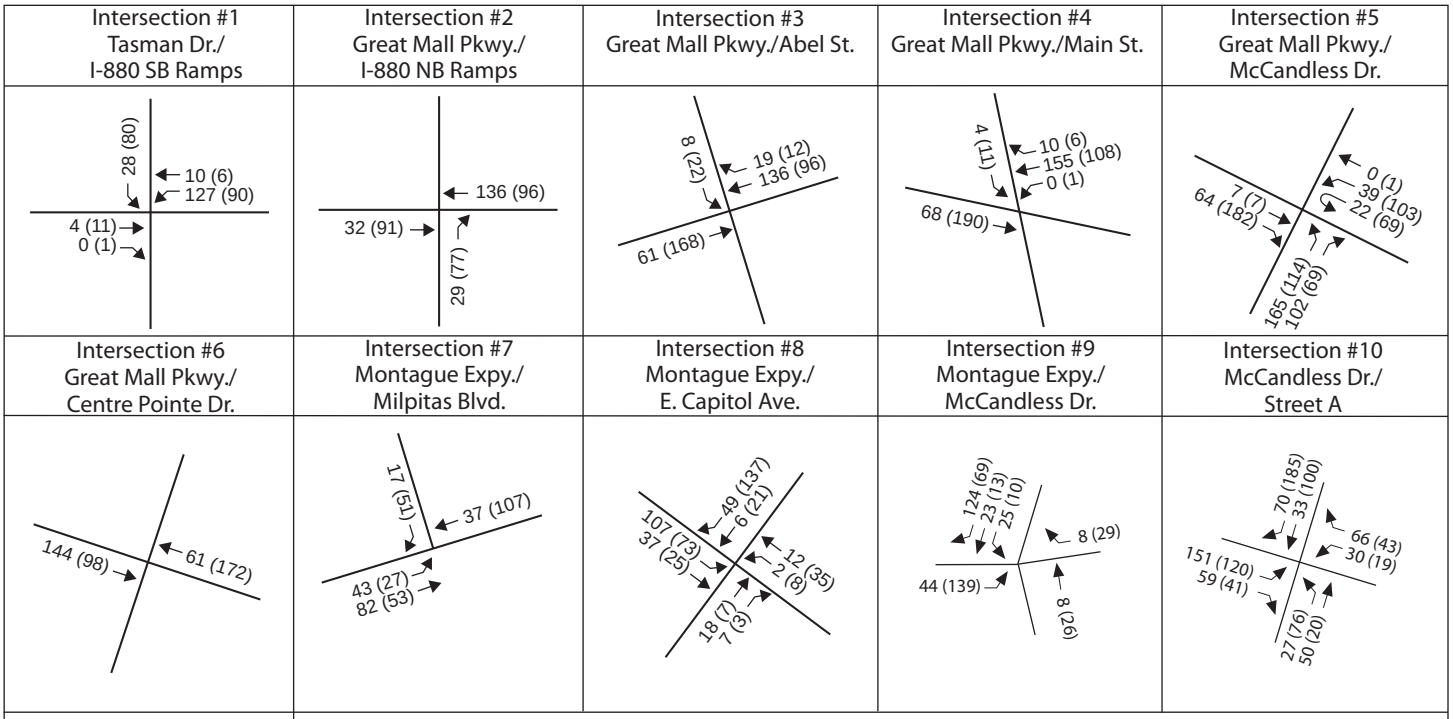
The following improvements are recommended to accommodate maximum queues anticipated under Background plus Project Conditions:

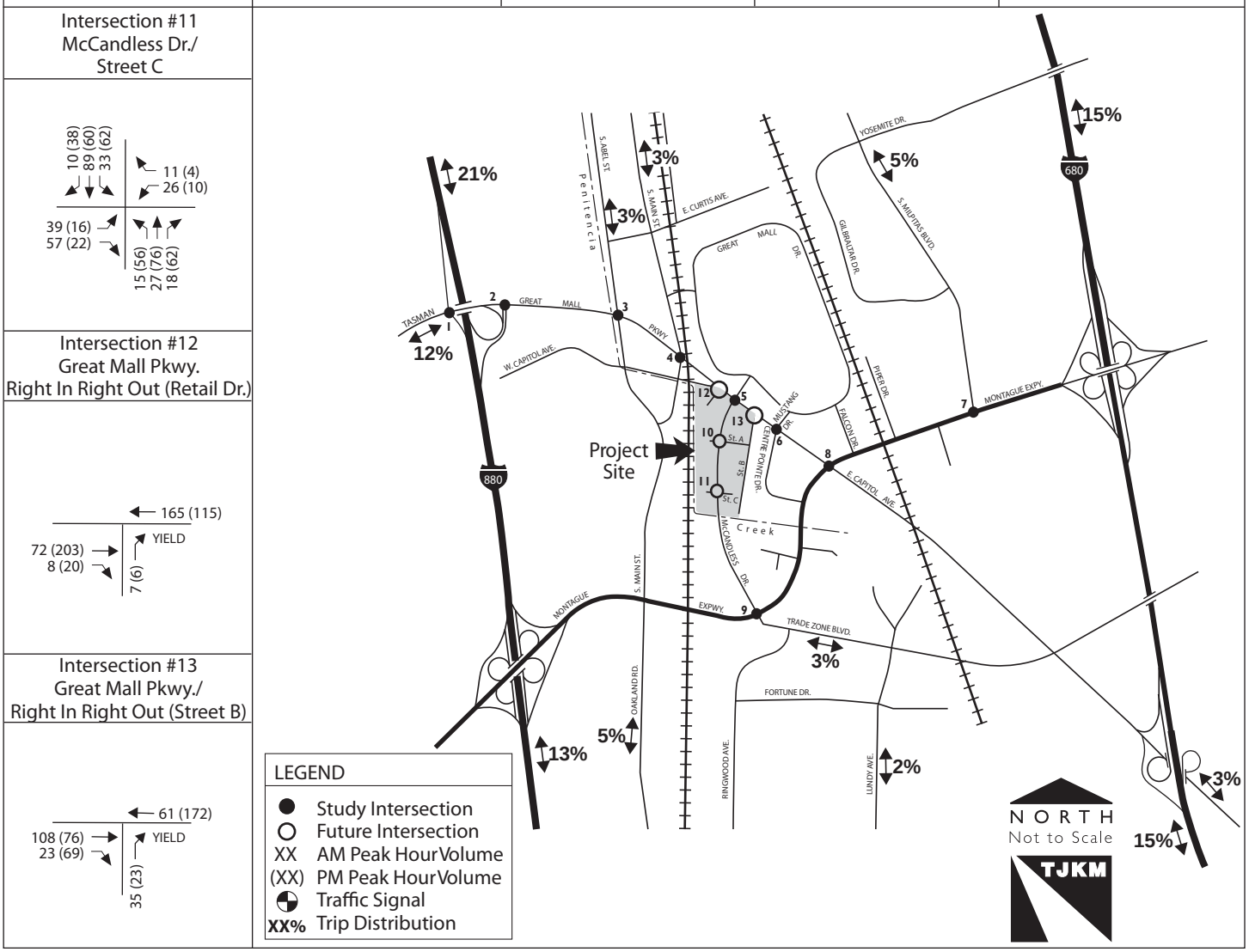
- Great Mall Parkway / McCandless Drive westbound left turn: Extend current vehicle storage length from 230 to 385 feet. The existing Great Mall Parkway median has sufficient length and width to accommodate this improvement.
- Montague Expressway / McCandless Drive / Trade Zone Boulevard eastbound left turn: Extend current vehicle storage length from 200 to 350 feet. The existing Montague Expressway median has sufficient length and width to accommodate this improvement.

City of Milpitas – Traffic Operations Analysis for McCandless Development

Proposed Project Trip Distribution and Assignment

Figure 6





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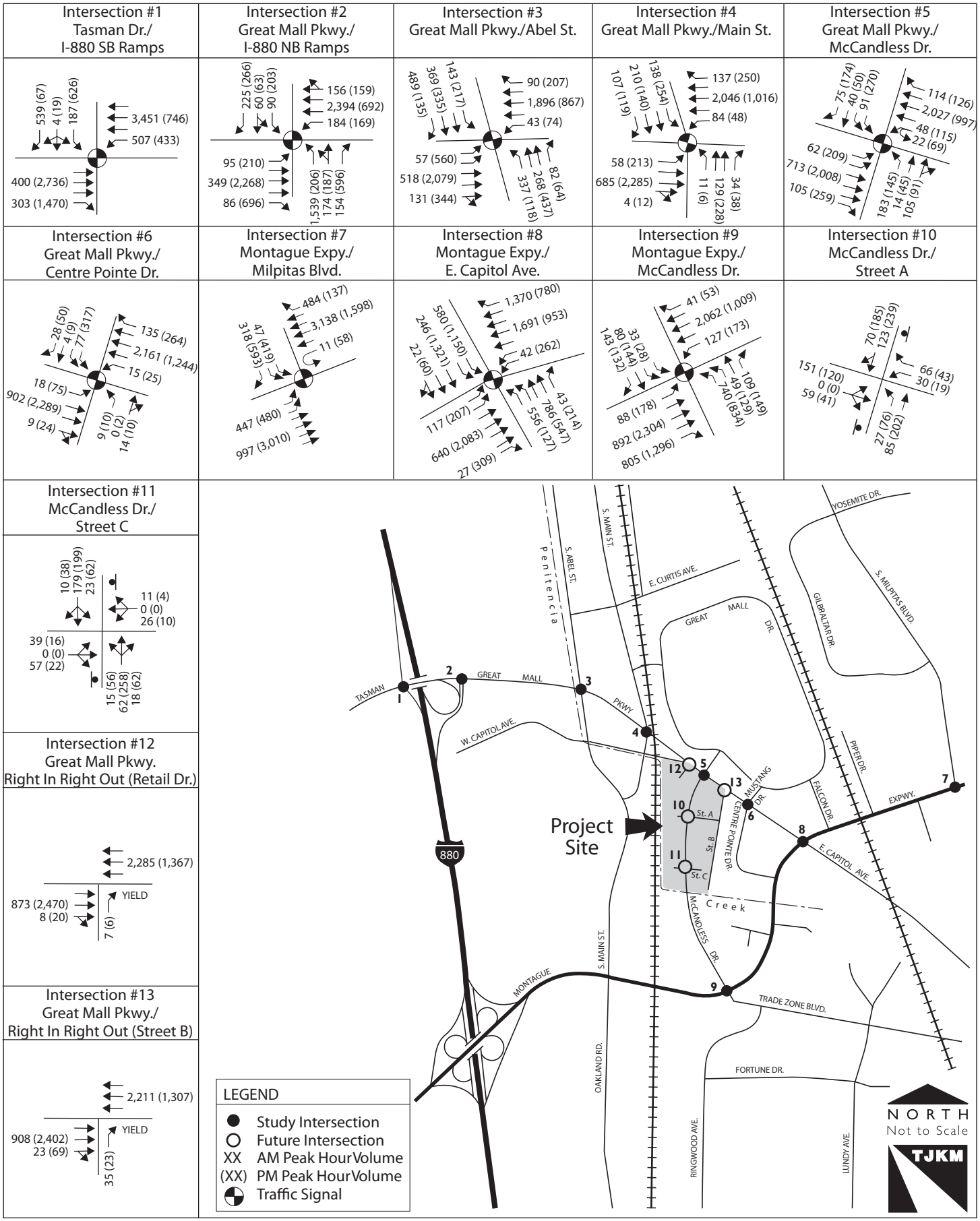
City of Milpitas – Traffic Operations Analysis for McCandless Development

Background plus Proposed Project Conditions Traffic Volumes, Lane Geometry and Traffic Controls

Figure 7



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Year 2030 Baseline Conditions

This section details expected traffic conditions at the study intersections under Year 2030 Baseline Conditions. This scenario estimates Year 2030 traffic conditions based on roadway link traffic volumes and land use projections documented in the Milpitas TASP.

Year 2030 Baseline Traffic Estimates

TJKM estimated 2030 traffic volumes for the study intersections using 2030 roadway link volume projections from the Milpitas TASP. Since there are no 2030 intersection volumes reported in the TASP DEIR, TJKM developed annual growth factors based on TASP link volume growth between 2004 and 2030 on Great Mall Parkway, Montague Expressway, and adjacent study area roadways. These factors were applied proportionately to existing vehicle turning movement volumes at the study intersections to estimate 2030 intersection volumes, which are assumed to include full build of the TASP. It should be noted that this procedure yielded 2030 link volumes that are less than originally projected in the TASP. While the application of annual growth factors assume an annual pace of traffic growth similar to TASP, it is reasonable to assume that 2030 link volumes would now be less than originally projected given the slower pace of development growth under current economic conditions.

To estimate 2030 Baseline intersection volumes, vehicle trip assignments from the proposed McCandless Development were subtracted out of the 2030 traffic volumes that assume full build of the Milpitas TASP. The resulting 2030 Baseline analysis scenario thereby provides a traffic operational basis of comparison for the proposed McCandless Development traffic.

Intersection Level of Service Analysis Results (Year 2030 Baseline Conditions)

Table VIII summarizes the results of the intersection LOS analysis for Year 2030 Baseline Conditions. Detailed calculation sheets are contained in Appendix F. All intersections are expected to continue operating acceptably, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
- Great Mall Parkway / S. Abel Street (LOS F during a.m. peak hour, LOS E during p.m. peak hour)
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours)
- Montague Expressway / McCandless Drive / Trade Zone Boulevard (LOS F during p.m. peak hour)

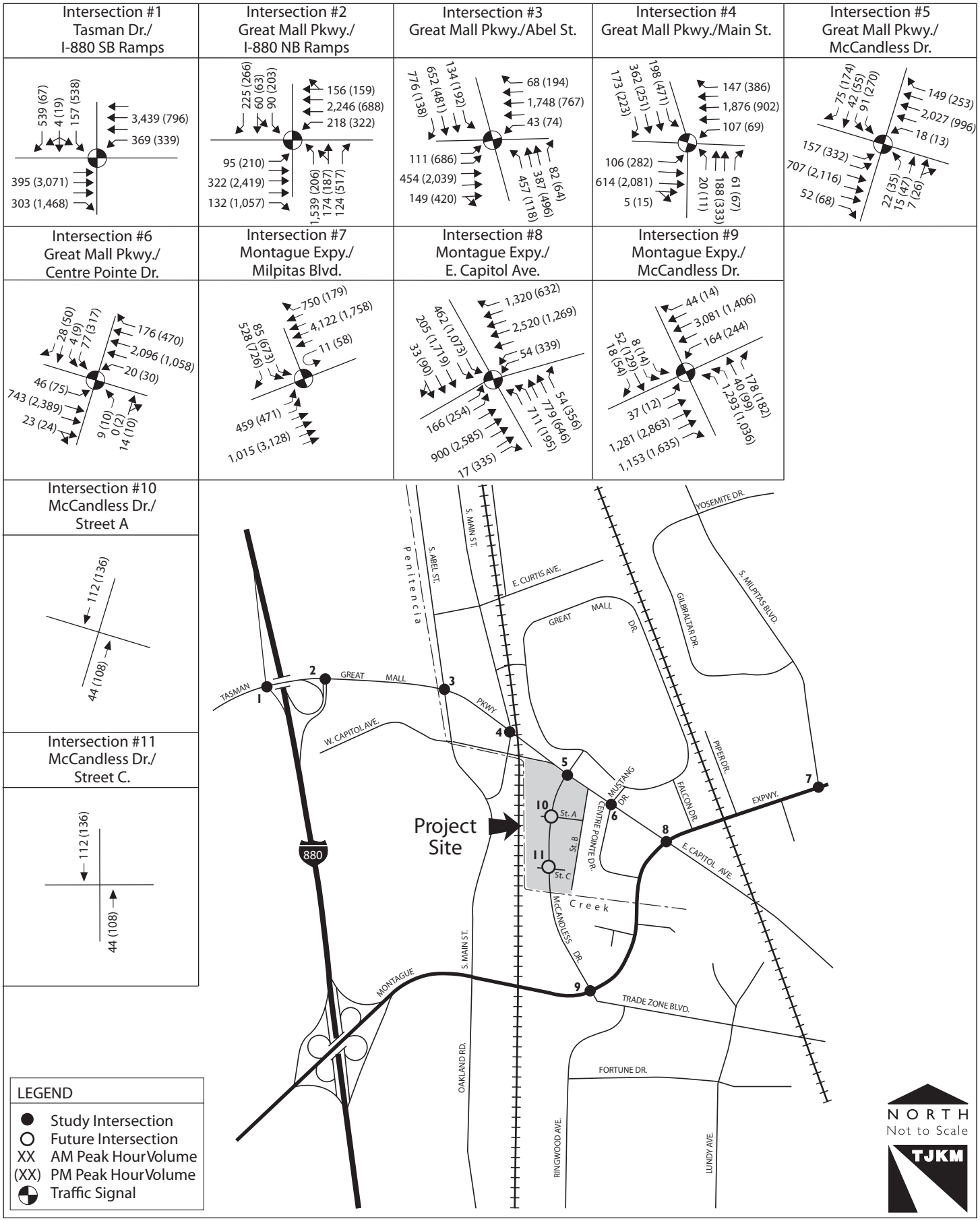
Table VIII: Intersection Levels of Service – Year 2030 Baseline Conditions

ID	Intersection	Control	Year 2030 Baseline Conditions			
			A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS
1	I-880 Southbound Ramps / Tasman Drive	Signal	33.4	C	**86.4**	**F**
2	I-880 Northbound Ramps / Tasman Drive	Signal	**179.3**	**F**	73.5	E
3	Great Mall Parkway / S. Abel Street	Signal	**102.6**	**F**	**71.8**	**E**
4	Great Mall Parkway / S. Main Street	Signal	39.9	D	61.9	E
5	Great Mall Parkway / McCandless Drive	Signal	18.6	B	27.6	C
6	Great Mall Parkway / Centre Pointe Drive	Signal	13.5	B	21.0	C
7	Montague Expressway / S. Milpitas Boulevard	Signal	37.5	D	29.2	C
8	Montague Expressway / Great Mall Parkway / E. Capitol Avenue	Signal	**118.2**	**F**	**122.3**	**F**
9	Montague Expressway / McCandless Drive / Trade Zone Boulevard	Signal	64.1	E	**101.0**	**F**

Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

City of Milpitas – Traffic Operations Analysis for McCandless Development
2030 Baseline Traffic Volumes, Lane Geometry and Traffic Controls

Figure 8



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Year 2030 plus Project Conditions

This scenario is similar to Year 2030 Baseline Conditions, but with the addition of traffic generated by the proposed McCandless Development. The assumed roadway network and nearby area development is assumed to be the same under this traffic scenario as for Year 2030 Baseline Conditions.

Project Trip Generation, Distribution, and Assignment

The expected proposed project trip generation, distribution, and assignment assumed under Year 2030 plus Project Conditions is identical to that assumed under Background plus Project Conditions.

Intersection Level of Service Analysis Results (Year 2030 plus Project Conditions)

The LOS analysis results for both Year 2030 Baseline and Year 2030 plus Project Conditions are summarized in Table IX. Detailed calculations are contained in Appendix G. All intersections are expected to continue operating acceptably, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds.
- I-880 Northbound Ramps / Tasman Drive - LOS F during a.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvement is required.
- Great Mall Parkway / S. Abel Street - LOS F during a.m. peak hour and LOS E during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds for the p.m. peak hour.
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue - LOS F during both peak hours, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds for both the a.m. and p.m. peak hours.
- Montague Expressway / McCandless Drive / Trade Zone Boulevard - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvement is required.

Table IX: Intersection Levels of Service – Year 2030 plus Project Conditions

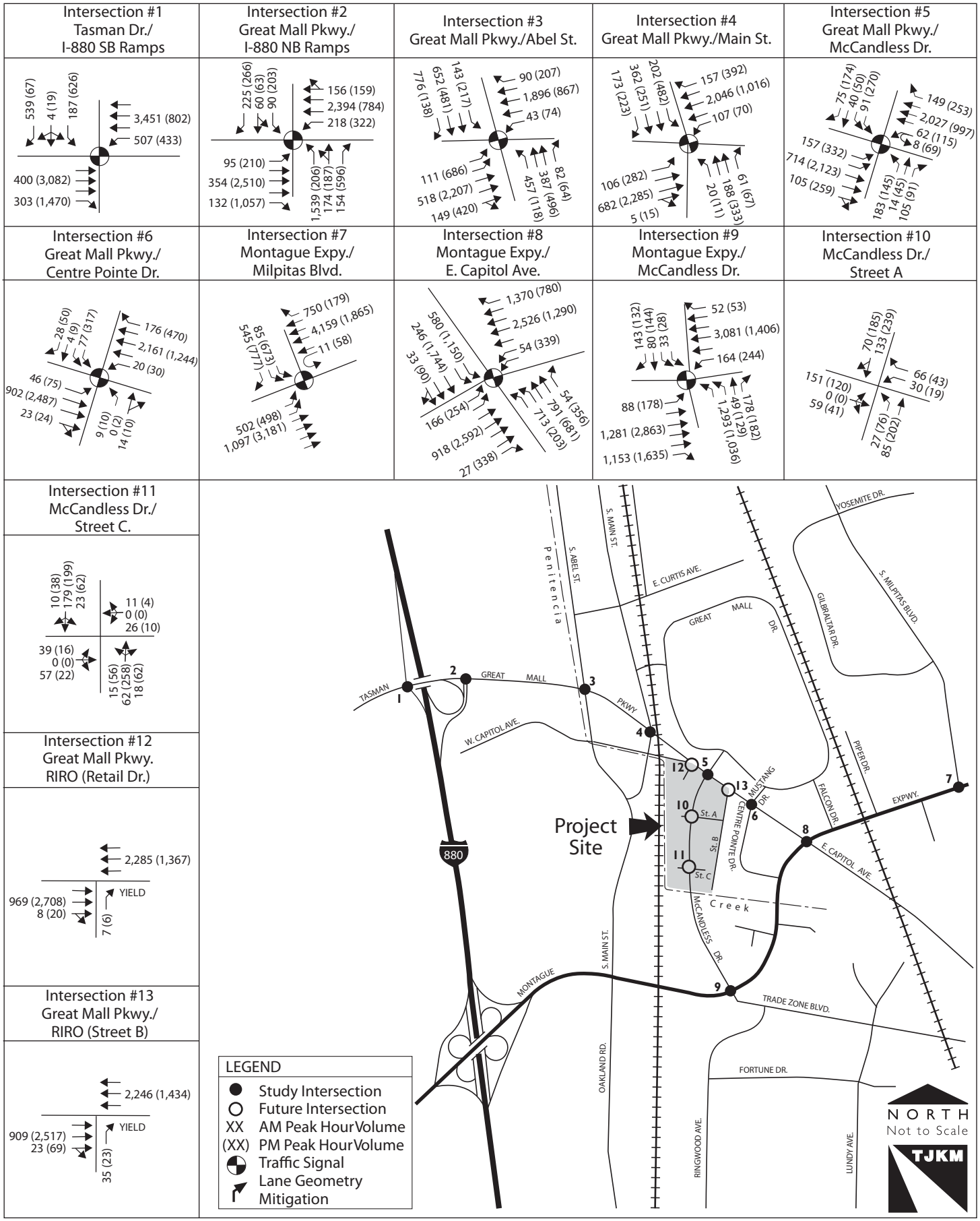
ID	Intersection	Control	Year 2030 Baseline Conditions				Year 2030 plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	I-880 Southbound Ramps / Tasman Drive	Signal	33.4	C	**86.4**	**F**	35.6	D	**106.3**	**F**
	Improvement (TASP Mitigation): Add eastbound right turn lane	*Signal*	-	-	-	-	*35.5*	*D*	*69.6*	*E*
2	I-880 Northbound Ramps / Tasman Drive	Signal	**179.3**	**F**	73.5	E	**182.3**	**F**	78.2	E
3	Great Mall Parkway / S. Abel Street	Signal	**102.6**	**F**	**71.8**	**E**	**106.4**	**F**	**77.7**	**E**
	Improvement: Add eastbound right turn lane, southbound right turn lane, and northbound left turn lane	*Signal*	-	-	-	-	*50.4*	*D*	*44.6*	*D*
4	Great Mall Parkway / S. Main Street	Signal	39.9	D	61.9	E	40.6	D	64.9	E
5	Great Mall Parkway / McCandless Drive	Signal	18.6	B	27.6	C	30.0	C	38.9	D
6	Great Mall Parkway / Centre Pointe Drive	Signal	13.5	B	21.0	C	13.6	B	22.1	C
7	Montague Expressway / S. Milpitas Boulevard	Signal	37.5	D	29.2	C	51.1	D	29.8	C
8	Montague Expressway / Great Mall Parkway / E. Capitol Avenue	Signal	**118.2**	**F**	**122.3**	**F**	**138.4**	**F**	**128.4**	**F**
9	Montague Expressway / McCandless Drive / Trade Zone Boulevard	Signal	64.1	E	**101.0**	**F**	71.8	E	**104.3**	**F**
10	McCandless Drive / Street "A" (Project Driveway)	Two-Way Stop	Project Intersection				15.1	C	25.7	D
11	McCandless Drive / Street "C" (Project Driveway)	Two-Way Stop	Project Intersection				11.7	B	17.4	C
12	Great Mall Parkway / RIRO Retail Driveway	One-Way Stop	Project Intersection				9.5	A	11.2	B
13	Great Mall Parkway / Street "B" (RIRO Driveway)	One-Way Stop	Project Intersection				9.6	A	10.5	B

Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

City of Milpitas – Traffic Operations Analysis for McCandless Development

2030 plus Proposed Project Conditions Traffic Volumes, Lane Geometry and Traffic Controls

Figure 9



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Intersection Transportation Improvement Measures (Year 2030 plus Project Conditions)

To address the above expected service levels exceeding LOS standards, the following transportation improvement measures are expected to be necessary:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour). With the prescribed Milpitas TASP improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, it should be noted that the TASP has indicated that this improvement may not be feasible due to potential bridge widening costs. City staff have stated that a fair share contribution should be made for future signal timing / traffic management improvements at this intersection.
- Great Mall Parkway / S. Abel Street – with an improvement of adding one eastbound right turn lane, one southbound right turn lane, and one northbound left turn lane, service levels are expected to improve to an acceptable LOS D during both peak hours. However, this improvement is not likely to be feasible. It should be noted that no improvements for this intersection were identified in the TASP, and this proposed improvement does not modify current signal timing plans at this intersection, which could be another solution to improve LOS to a manageable level without widening. Furthermore, this improvement would require widening two intersection approaches, which is not likely to be feasible due to the proximity of a residential subdivision in the southwest quadrant. It is also important to note that the McCandless Development's expected trip assignments through the intersection would not add to the specific turning movements proposed for additional turn lanes for this improvement.
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue. The Milpitas TASP EIR identified a grade-separated urban interchange as the only feasible improvement at this intersection. However, it should be noted that according to the EIR, this improvement is not fully funded.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

Expected Vehicle Queues at City Roadway Access Points

TJKM evaluated the potential effects of added traffic from the proposed project on vehicle queue lengths for existing turn lanes on City roadways directly serving the project site. The evaluation included analysis of 95th percentile (maximum) queues expected with the addition of proposed project traffic, and results are included in Appendix G. Table X shows expected vehicle queues for the turn pockets of project access intersections under 2030 plus Project Conditions. The table shows that the following existing turn pockets are expected to exceed available vehicle storage capacity with the addition of proposed project traffic:

- Great Mall Parkway / McCandless Drive – westbound left turn
- Montague Expressway / McCandless Drive / Trade Zone Boulevard – eastbound left turn

Table X: Expected Turn Pocket Vehicle Queues – 2030 plus Project Conditions

Intersection and Turn Pocket	*Storage Length (feet)*	*95th Percentile Queue Length (feet)*	
		A.M. Peak Hour	*P.M. Peak Hour*
Great Mall Parkway / McCandless Drive			
Eastbound Right Turn	260	37	163
Westbound Left Turn	230	133	**385**
Improvement: Extend WB LTL from 230 to 385 feet	*370*	*133*	*385*
Northbound Left Turn	385**	343	211
Montague Expressway / McCandless Drive / Trade Zone Boulevard			
Eastbound Left Turn	200	**271**	**334**
Improvement: Extend EB LTL from 200 to 350 feet	*350*	*271*	*334*
Westbound Right Turn	100	- *	- *
Southbound Left Turn	180	45	38
Southbound Right Turn	200	- *	- *
McCandless Drive / Street "A" (Project Driveway)			
Northbound Left Turn	75**	2	6

Notes: 1) * = free turn, ** = proposed storage length with project
2) McCandless Drive / Street "C" (Project Driveway) - all assumed to be single-lane approaches
3) Great Mall Parkway / McCandless Drive northbound left turn queuing results based on SimTraffic simulation.

The following improvements are recommended to accommodate maximum queues anticipated under 2030 plus Project Conditions:

- Great Mall Parkway / McCandless Drive westbound left turn: Extend current vehicle storage length from 230 to 385 feet. The existing Great Mall Parkway median has sufficient length and width to accommodate this improvement.
- Montague Expressway / McCandless Drive / Trade Zone Boulevard eastbound left turn: Extend current vehicle storage length from 200 to 350 feet. The existing Montague Expressway median has sufficient length and width to accommodate this improvement.

Conclusions

TJKM has reached the following conclusions regarding the proposed mixed-use McCandless Development in the City of Milpitas:

Project Trip Generation
The proposed McCandless Development is expected to generate a net of 9,707 daily vehicle trips, including 676 during the a.m. peak hour and 872 during the p.m. peak hour, after applying all applicable trip discounts.

Existing Conditions
Currently, all study intersections operate at acceptable LOS based on applicable jurisdictional standards during both weekday a.m. and p.m. peak hours.

Background Conditions
All intersections are expected to continue to meet acceptable LOS standards, with the following exceptions:

- I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
- I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
- Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during a.m. peak hour)

Background plus Project Conditions

- All intersections are expected to continue operating under acceptable jurisdictional standards as under Background Conditions, with the following exceptions:
    - I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, with increased average delay beyond four seconds. With the prescribed Milpitas Transit Area Specific Plan (TASP) improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, the TASP notes that this improvement may not be feasible due to potential bridge widening costs. City staff have stated that a fair share contribution should be made for future signal timing / traffic management improvements at this intersection.
    - I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour). However, since average delay during the a.m. peak hour is expected to increase by fewer than four seconds (1.7), the applicable LOS threshold is not exceeded and a transportation improvement would not be required.
    - Great Mall Parkway / S. Abel Street – intersection operations are expected to change from LOS D to E with the addition of project traffic during both peak hours. An improvement of adding an eastbound right turn lane and southbound right turn lane is expected to improve operations to LOS D during both peak hours. However, it should be noted that this improvement is not listed as a TASP mitigation and may not be feasible due to the proximity of a residential subdivision in the southwest quadrant.
    - Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours). During the a.m. peak hour, the baseline LOS F condition is expected to continue, with increased average delay beyond four seconds. During the p.m. peak hour, service levels are expected to increase from LOS E to F. The Milpitas TASP Environmental Impact Report (EIR) identified a grade-separated urban interchange as the only feasible improvement at this intersection. However, the EIR states that this improvement is not fully funded.

- An evaluation of 95th percentile (maximum) queue lengths under Background plus Project Conditions on City roadways directly serving the project site revealed that the following existing turn pockets are expected to have vehicle queues exceeding existing vehicle storage lengths with the addition of project traffic:
  - Great Mall Parkway / McCandless Drive – westbound left turn. Extending the current vehicle storage length from 230 to 385 feet is expected to accommodate the maximum expected vehicle queue and can be constructed within the existing Great Mall Parkway median.
  - Montague Expressway / McCandless Drive / Trade Zone Boulevard – eastbound left turn. Extending the current vehicle storage length from 200 to 350 feet is expected to accommodate the maximum expected vehicle queue and can be constructed within the existing Montague Expressway median.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

2030 Baseline Conditions

- All intersections are expected to continue to meet acceptable LOS standards, with the following exceptions:
  - I-880 Southbound Ramps / Tasman Drive (LOS F during p.m. peak hour)
  - I-880 Northbound Ramps / Tasman Drive (LOS F during a.m. peak hour)
  - Great Mall Parkway / S. Abel Street (LOS F during a.m. peak hour, LOS E during p.m. peak hour)
  - Montague Expressway / Great Mall Parkway / E. Capitol Avenue (LOS F during both peak hours)
  - Montague Expressway / McCandless Drive / Trade Zone Boulevard (LOS F during p.m. peak hour)

2030 plus Project Conditions

- All intersections are expected to continue operating acceptably, with the following exceptions:
  - I-880 Southbound Ramps / Tasman Drive - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds. With the prescribed Milpitas TASP improvement of adding an eastbound right turn lane, service levels are expected to improve to an acceptable LOS E. However, this improvement may not be feasible due to potential bridge widening costs.
  - I-880 Northbound Ramps / Tasman Drive - LOS F during a.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvements are required.
  - Great Mall Parkway / S. Abel Street - LOS F during a.m. peak hour and LOS E during p.m. peak hour, just as under 2030 Baseline Conditions, with increased average delay greater than four seconds during the p.m. peak hour. An improvement of adding one eastbound right turn lane, one southbound right turn lane, and one northbound left turn lane is expected to improve operations to LOS D during both peak hours. However, it should be noted that this improvement is not listed as a TASP mitigation and may not be feasible due to the proximity of a residential subdivision in the southwest quadrant.

  - Montague Expressway / Great Mall Parkway / E. Capitol Avenue - LOS F during both peak hours, just as under 2030 Baseline Conditions, but with increased average delay beyond four seconds for both the a.m. and p.m. peak hours. A proposed grade-separated urban interchange is the only TASP-identified feasible improvement at this intersection, but is not fully funded.
  - Montague Expressway / McCandless Drive / Trade Zone Boulevard - LOS F during p.m. peak hour, just as under 2030 Baseline Conditions, but with increased average delay by fewer than four seconds. Therefore, no transportation improvements are required.
- An evaluation of 95th percentile (maximum) queue lengths under 2030 plus Project Conditions on City roadways directly serving the project site revealed that the same existing turn pockets identified under Background plus Project Conditions are expected to experience spillover conditions with the addition of project traffic. The same improvements identified under Background plus Project Conditions are expected to accommodate the maximum queues expected under 2030 plus Project Conditions.

It should be noted that City staff have also indicated that a fair share contribution should be made in terms of the TASP impact fee and Calaveras Bridge widening impact fee.

Study References

TJKM Personnel

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Traffic Data Collection

Traffic Data Service (TDS), 2010

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Jorge Duran, P.E.	Ruggeri-Jensen-Azar Engineers, Planners, Surveyors
Tobin Symmank, LEED AP, CGBP	Architects Orange

References

- *City of Milpitas Engineering Guidelines.*
- *Comprehensive County Expressway Planning Study.* County of Santa Clara Roads and Airports Department, March 2009.
- *Milpitas Transit Area Specific Plan, Draft Environmental Impact Report, State Clearinghouse No. 2006032091,* October 2007.
- *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2000.
- *San Diego Traffic Generators,* San Diego Association of Governments (SANDAG), 2002.
- *Traffic Operations Analysis for a Residential Development Project in the Piper-Montague Subdistrict of the Milpitas Transit Area Specific Plan,* Hexagon Transportation Consultants, 2008.

Appendix A – Level of Service Methodology

APPENDIX A
LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service (LOS) are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table A-I

Table A-I: Level of Service Description

	Uninterrupted Flow	***Interrupted Flow***
Facility Type	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High-density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.
Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks.

Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating LOS. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

LOS B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

LOS C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

LOS D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

LOS E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine LOS stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table A-II describes the functional and design categories, while Table A-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the LOS is found by comparing the speed to the criteria in Table A-IV. LOS criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table A-II: Functional and Design Categories for Urban Streets

Criterion	***Functional Category***	
	Principal Arterial	***Minor Arterial***
Mobility function	Very important	Important
Access function	Very minor	Substantial
Points connected	Freeways, important activity centers, major traffic generators	Principal arterials
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city	Trips of moderate length within relatively small geographical areas

Criterion	***Design Category***			
	High-Speed	***Suburban***	***Intermediate***	***Urban***
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table A-III: Urban Street Class based on Function and Design Categories

Design Category	*Functional Category*	
	Principal Arterial	*Minor Arterial*
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table A-IV: Urban Street Levels of Service by Class

Urban Street Class	*I*	*II*	*III*	*IV*
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
LOS	*Average Travel Speed (mph)*			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

LOS for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the control delay to better describe the level of operation. A description of levels of service for signalized intersections can be found in Table A-V

Table A-V: Description of Level of Service for Signalized Intersections

LOS	*Description*
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the LOS criteria listed in Table A-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine LOS. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS designation is given to the expected control delay for each minor movement. LOS is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table A-VI.

Table A-VI: Description of Level of Service for Two-Way Stop Controlled Intersections

LOS	***Description***
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: *Highway Capacity Manual 2000*

Appendix B – Existing Traffic Counts

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Groups Printed- Vehicles

	I-880 SB RAMPS Southbound					E. TASMAN DR Westbound					I-880 SB RAMPS Northbound					E. TASMAN DR Eastbound					
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	99	0	12	2	113	0	212	32	0	244	0	0	0	0	0	12	28	0	0	40	397
07:15 AM	114	0	20	0	134	0	260	42	0	302	0	0	0	0	0	15	26	0	0	41	477
07:30 AM	107	0	33	0	140	1	384	55	0	440	0	0	0	0	0	11	21	0	0	32	612
07:45 AM	110	1	29	1	141	3	500	73	0	576	0	0	0	0	0	12	26	0	0	38	755
Total	430	1	94	3	528	4	1356	202	0	1562	0	0	0	0	0	50	101	0	0	151	2241
08:00 AM	113	0	21	1	135	0	465	73	0	538	0	0	0	0	0	20	30	0	0	50	723
08:15 AM	115	2	21	0	138	0	623	44	0	667	0	0	0	0	0	31	35	0	0	66	871
08:30 AM	124	1	31	0	156	1	610	73	0	684	0	0	0	0	0	34	33	0	0	67	907
08:45 AM	110	1	19	0	130	0	628	67	0	695	0	0	0	0	0	23	36	0	0	59	884
Total	462	4	92	1	559	1	2326	257	0	2584	0	0	0	0	0	108	134	0	0	242	3385
Grand Total	892	5	186	4	1087	5	3682	459	0	4146	0	0	0	0	0	158	235	0	0	393	5626
Apprch %	82.1	0.5	17.1	0.4		0.1	88.8	11.1	0		0	0	0	0		40.2	59.8	0	0		
Total %	15.9	0.1	3.3	0.1	19.3	0.1	65.4	8.2	0	73.7	0	0	0	0	0	2.8	4.2	0	0	7	

	I-880 SB RAMPS Southbound					E. TASMAN DR Westbound					I-880 SB RAMPS Northbound					E. TASMAN DR Eastbound					
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	113	0	21	1	135	0	465	73	0	538	0	0	0	0	0	20	30	0	0	50	723
08:15 AM	115	2	21	0	138	0	623	44	0	667	0	0	0	0	0	31	35	0	0	66	871
08:30 AM	124	1	31	0	156	1	610	73	0	684	0	0	0	0	0	34	33	0	0	67	907
08:45 AM	110	1	19	0	130	0	628	67	0	695	0	0	0	0	0	23	36	0	0	59	884
Total Volume	462	4	92	1	559	1	2326	257	0	2584	0	0	0	0	0	108	134	0	0	242	3385
% App. Total																					
PHF	.931	.500	.742	.250	.896	.250	.926	.880	.000	.929	.000	.000	.000	.000	.000	.794	.931	.000	.000	.903	.933

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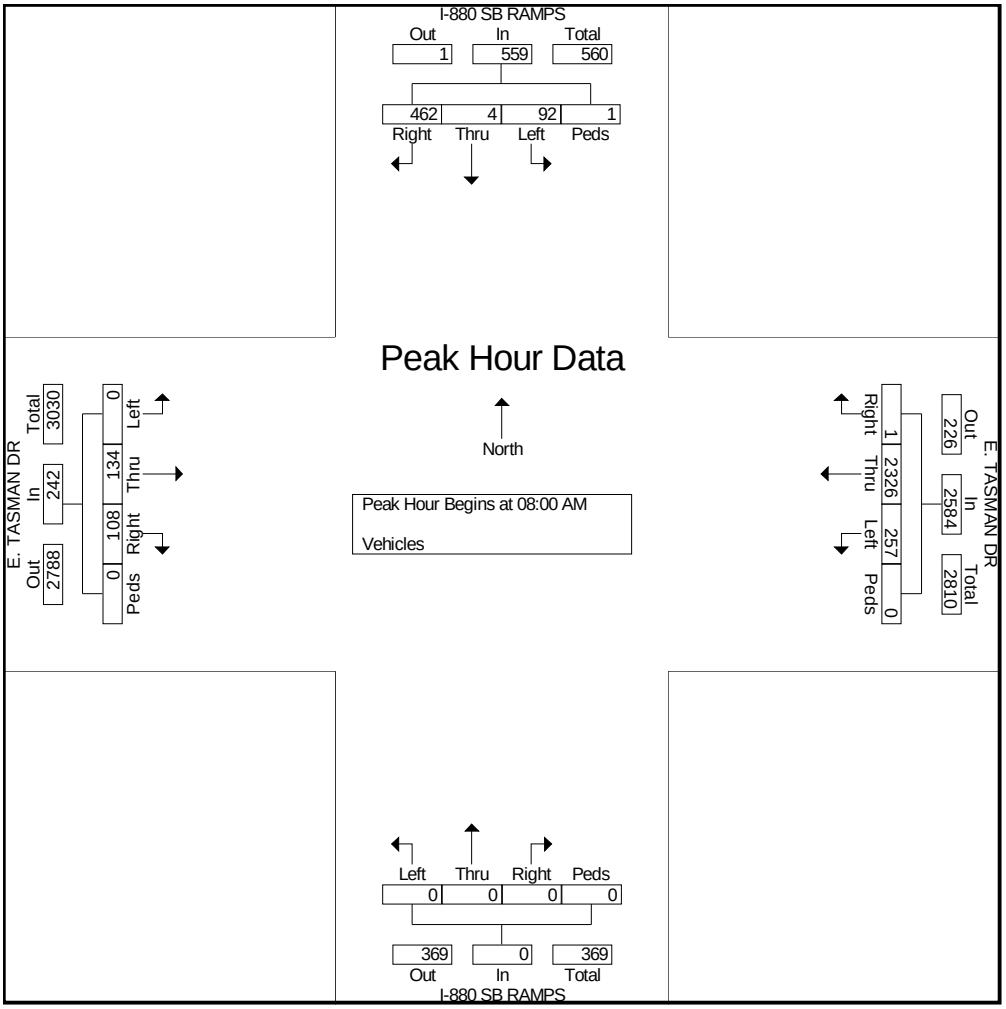

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Groups Printed- Vehicles

	I-880 SB RAMPS Southbound					E. TASMAN DR Westbound					I-880 SB RAMPS Northbound					E. TASMAN DR Eastbound					
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	22	0	71	2	95	0	96	63	0	159	0	0	0	0	0	158	259	0	1	418	672
04:15 PM	13	1	66	0	80	0	97	33	0	130	0	0	0	0	0	165	299	0	0	464	674
04:30 PM	12	0	72	0	84	0	97	40	0	137	0	0	0	0	0	180	311	0	0	491	712
04:45 PM	12	1	60	1	74	0	90	51	0	141	0	0	0	0	0	151	360	0	0	511	726
Total	59	2	269	3	333	0	380	187	0	567	0	0	0	0	0	654	1229	0	1	1884	2784
05:00 PM	18	1	103	1	123	0	102	40	0	142	0	0	0	0	0	205	441	0	0	646	911
05:15 PM	12	4	106	1	123	0	105	30	0	135	0	0	0	0	0	216	455	0	0	671	929
05:30 PM	11	9	124	0	144	0	94	40	0	134	0	0	0	0	0	189	488	0	0	677	955
05:45 PM	8	5	121	0	134	0	98	46	0	144	0	0	0	0	0	156	493	0	0	649	927
Total	49	19	454	2	524	0	399	156	0	555	0	0	0	0	0	766	1877	0	0	2643	3722
Grand Total	108	21	723	5	857	0	779	343	0	1122	0	0	0	0	0	1420	3106	0	1	4527	6506
Apprch %	12.6	2.5	84.4	0.6		0	69.4	30.6	0		0	0	0	0		31.4	68.6	0	0		
Total %	1.7	0.3	11.1	0.1	13.2	0	12	5.3	0	17.2	0	0	0	0	0	21.8	47.7	0	0	69.6	

	I-880 SB RAMPS Southbound					E. TASMAN DR Westbound					I-880 SB RAMPS Northbound					E. TASMAN DR Eastbound					
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	18	1	103	1	123	0	102	40	0	142	0	0	0	0	0	205	441	0	0	646	911
05:15 PM	12	4	106	1	123	0	105	30	0	135	0	0	0	0	0	216	455	0	0	671	929
05:30 PM	11	9	124	0	144	0	94	40	0	134	0	0	0	0	0	189	488	0	0	677	955
05:45 PM	8	5	121	0	134	0	98	46	0	144	0	0	0	0	0	156	493	0	0	649	927
Total Volume	49	19	454	2	524	0	399	156	0	555	0	0	0	0	0	766	1877	0	0	2643	3722
% App. Total																					
PHF	.681	.528	.915	.500	.910	.000	.950	.848	.000	.964	.000	.000	.000	.000	.000	.887	.952	.000	.000	.976	.974

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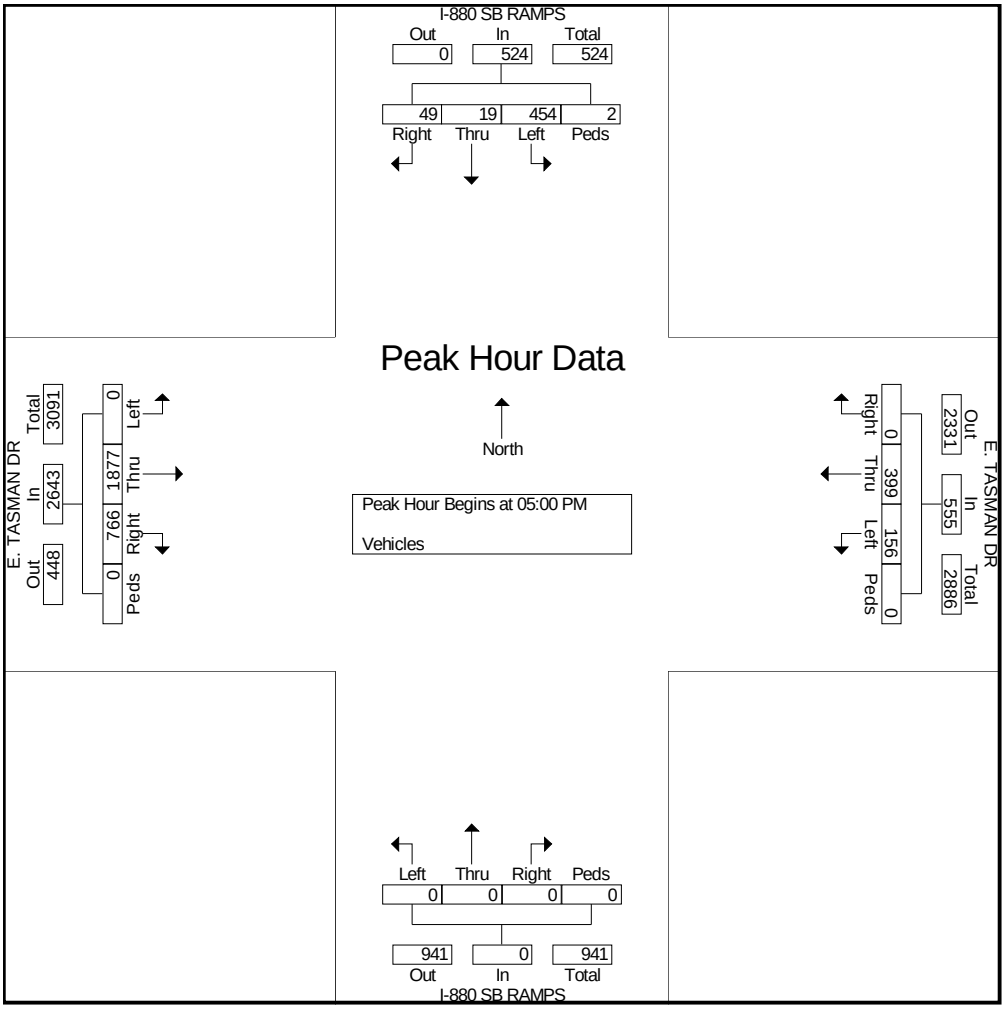

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Groups Printed- Vehicles

	THOMPSON ST Southbound					TASMAN DR Westbound					I-880 NB RAMPS Northbound					TASMAN DR Eastbound					
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	3	1	4	0	8	2	180	30	0	212	33	28	54	0	115	5	30	5	0	40	375
07:15 AM	7	11	0	2	20	15	193	32	0	240	10	16	95	0	121	0	24	2	0	26	407
07:30 AM	15	6	1	0	22	11	266	38	0	315	12	16	145	0	173	0	38	6	0	44	554
07:45 AM	25	1	3	0	29	11	347	32	0	390	25	10	182	0	217	0	37	4	0	41	677
Total	50	19	8	2	79	39	986	132	0	1157	80	70	476	0	626	5	129	17	0	151	2013
08:00 AM	30	11	6	0	47	14	317	45	0	376	14	17	195	0	226	0	33	8	0	41	690
08:15 AM	21	7	3	0	31	13	452	41	0	506	11	4	229	0	244	30	29	2	0	61	842
08:30 AM	30	3	6	0	39	11	434	38	0	483	6	10	209	0	225	15	40	10	0	65	812
08:45 AM	51	7	7	0	65	12	456	43	0	511	15	9	214	0	238	7	38	4	0	49	863
Total	132	28	22	0	182	50	1659	167	0	1876	46	40	847	0	933	52	140	24	0	216	3207
Grand Total	182	47	30	2	261	89	2645	299	0	3033	126	110	1323	0	1559	57	269	41	0	367	5220
Apprch %	69.7	18	11.5	0.8		2.9	87.2	9.9	0		8.1	7.1	84.9	0		15.5	73.3	11.2	0		
Total %	3.5	0.9	0.6	0	5	1.7	50.7	5.7	0	58.1	2.4	2.1	25.3	0	29.9	1.1	5.2	0.8	0	7	

	THOMPSON ST Southbound					TASMAN DR Westbound					I-880 NB RAMPS Northbound					TASMAN DR Eastbound					
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	30	11	6	0	47	14	317	45	0	376	14	17	195	0	226	0	33	8	0	41	690
08:15 AM	21	7	3	0	31	13	452	41	0	506	11	4	229	0	244	30	29	2	0	61	842
08:30 AM	30	3	6	0	39	11	434	38	0	483	6	10	209	0	225	15	40	10	0	65	812
08:45 AM	51	7	7	0	65	12	456	43	0	511	15	9	214	0	238	7	38	4	0	49	863
Total Volume	132	28	22	0	182	50	1659	167	0	1876	46	40	847	0	933	52	140	24	0	216	3207
% App. Total																					
PHF	.647	.636	.786	.000	.700	.893	.910	.928	.000	.918	.767	.588	.925	.000	.956	.433	.875	.600	.000	.831	.929

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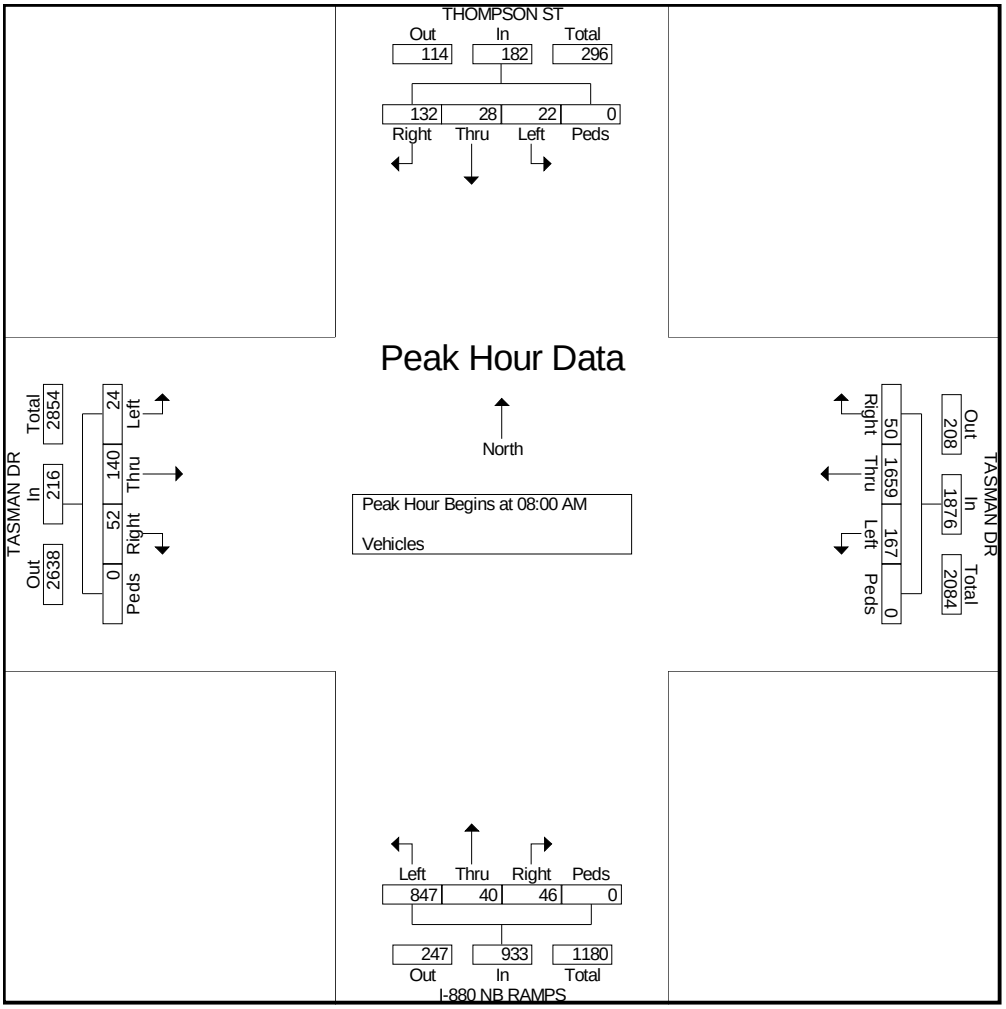

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Groups Printed- Vehicles

	THOMPSON DR Southbound					TASMAN DR Westbound					I-880 NB RAMPS Northbound					TASMAN DR Eastbound					
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	28	11	14	0	53	5	77	37	0	119	61	14	22	0	97	106	218	10	0	334	603
04:15 PM	11	8	11	0	30	9	87	31	0	127	64	13	30	0	107	124	235	12	0	371	635
04:30 PM	23	5	13	0	41	9	82	32	0	123	98	9	31	0	138	124	252	10	0	386	688
04:45 PM	16	9	10	1	36	18	93	32	1	144	78	16	24	0	118	123	301	6	0	430	728
Total	78	33	48	1	160	41	339	132	1	513	301	52	107	0	460	477	1006	38	0	1521	2654
05:00 PM	23	2	18	1	44	9	95	36	0	140	70	14	36	0	120	155	334	14	0	503	807
05:15 PM	20	5	27	0	52	9	95	38	0	142	114	10	16	0	140	158	395	17	0	570	904
05:30 PM	21	6	19	0	46	9	84	44	1	138	124	15	22	0	161	173	385	33	0	591	936
05:45 PM	19	1	11	0	31	15	116	42	0	173	115	22	45	0	182	158	415	35	0	608	994
Total	83	14	75	1	173	42	390	160	1	593	423	61	119	0	603	644	1529	99	0	2272	3641
Grand Total	161	47	123	2	333	83	729	292	2	1106	724	113	226	0	1063	1121	2535	137	0	3793	6295
Apprch %	48.3	14.1	36.9	0.6		7.5	65.9	26.4	0.2		68.1	10.6	21.3	0		29.6	66.8	3.6	0		
Total %	2.6	0.7	2	0	5.3	1.3	11.6	4.6	0	17.6	11.5	1.8	3.6	0	16.9	17.8	40.3	2.2	0	60.3	

	THOMPSON DR Southbound					TASMAN DR Westbound					I-880 NB RAMPS Northbound					TASMAN DR Eastbound					
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	23	2	18	1	44	9	95	36	0	140	70	14	36	0	120	155	334	14	0	503	807
05:15 PM	20	5	27	0	52	9	95	38	0	142	114	10	16	0	140	158	395	17	0	570	904
05:30 PM	21	6	19	0	46	9	84	44	1	138	124	15	22	0	161	173	385	33	0	591	936
05:45 PM	19	1	11	0	31	15	116	42	0	173	115	22	45	0	182	158	415	35	0	608	994
Total Volume	83	14	75	1	173	42	390	160	1	593	423	61	119	0	603	644	1529	99	0	2272	3641
% App. Total																					
PHF	.902	.583	.694	.250	.832	.700	.841	.909	.250	.857	.853	.693	.661	.000	.828	.931	.921	.707	.000	.934	.916

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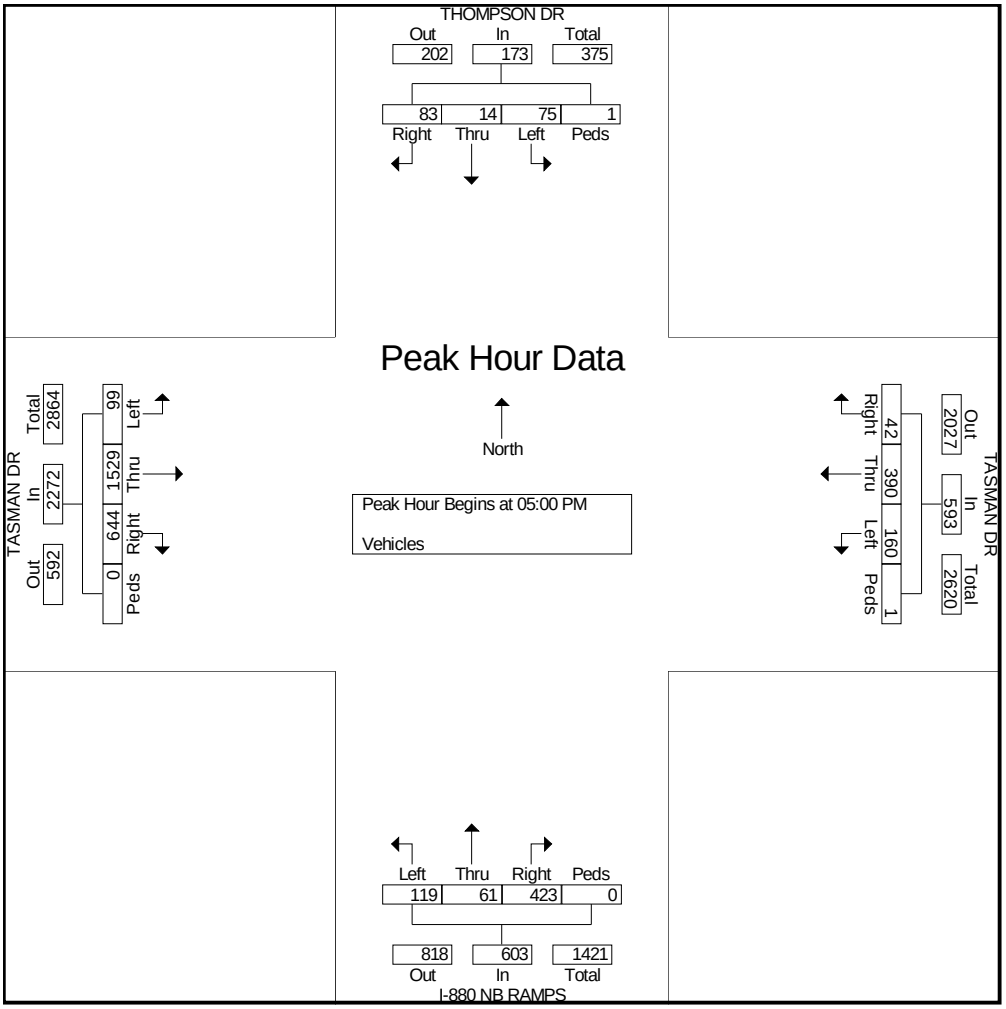

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Groups Printed- Vehicles

	S. ABEL ST Southbound					GREAT MALL PKWY Westbound					S. ABEL ST Northbound					GREAT MALL PKWY Eastbound					
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	34	18	8	0	60	10	145	2	2	159	4	31	19	0	54	6	21	7	0	34	307
07:15 AM	43	24	11	0	78	19	209	3	0	231	6	55	26	0	87	7	27	5	1	40	436
07:30 AM	60	44	25	0	129	6	238	6	0	250	7	77	35	0	119	8	41	15	1	65	563
07:45 AM	79	63	20	1	163	13	232	3	0	248	15	36	44	0	95	13	47	12	2	74	580
Total	216	149	64	1	430	48	824	14	2	888	32	199	124	0	355	34	136	39	4	213	1886
08:00 AM	98	89	10	0	197	16	252	2	0	270	20	49	31	1	101	17	33	14	3	67	635
08:15 AM	102	70	18	0	190	11	346	11	0	368	8	36	62	0	106	22	47	8	0	77	741
08:30 AM	91	114	11	1	217	8	359	3	0	370	8	59	78	0	145	9	29	11	3	52	784
08:45 AM	111	65	19	0	195	24	306	2	0	332	5	60	70	0	135	11	30	11	0	52	714
Total	402	338	58	1	799	59	1263	18	0	1340	41	204	241	1	487	59	139	44	6	248	2874
Grand Total	618	487	122	2	1229	107	2087	32	2	2228	73	403	365	1	842	93	275	83	10	461	4760
Apprch %	50.3	39.6	9.9	0.2		4.8	93.7	1.4	0.1		8.7	47.9	43.3	0.1		20.2	59.7	18	2.2		
Total %	13	10.2	2.6	0	25.8	2.2	43.8	0.7	0	46.8	1.5	8.5	7.7	0	17.7	2	5.8	1.7	0.2	9.7	

	S. ABEL ST Southbound					GREAT MALL PKWY Westbound					S. ABEL ST Northbound					GREAT MALL PKWY Eastbound					
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	98	89	10	0	197	16	252	2	0	270	20	49	31	1	101	17	33	14	3	67	635
08:15 AM	102	70	18	0	190	11	346	11	0	368	8	36	62	0	106	22	47	8	0	77	741
08:30 AM	91	114	11	1	217	8	359	3	0	370	8	59	78	0	145	9	29	11	3	52	784
08:45 AM	111	65	19	0	195	24	306	2	0	332	5	60	70	0	135	11	30	11	0	52	714
Total Volume	402	338	58	1	799	59	1263	18	0	1340	41	204	241	1	487	59	139	44	6	248	2874
% App. Total																					
PHF	.905	.741	.763	.250	.921	.615	.880	.409	.000	.905	.513	.850	.772	.250	.840	.670	.739	.786	.500	.805	.916

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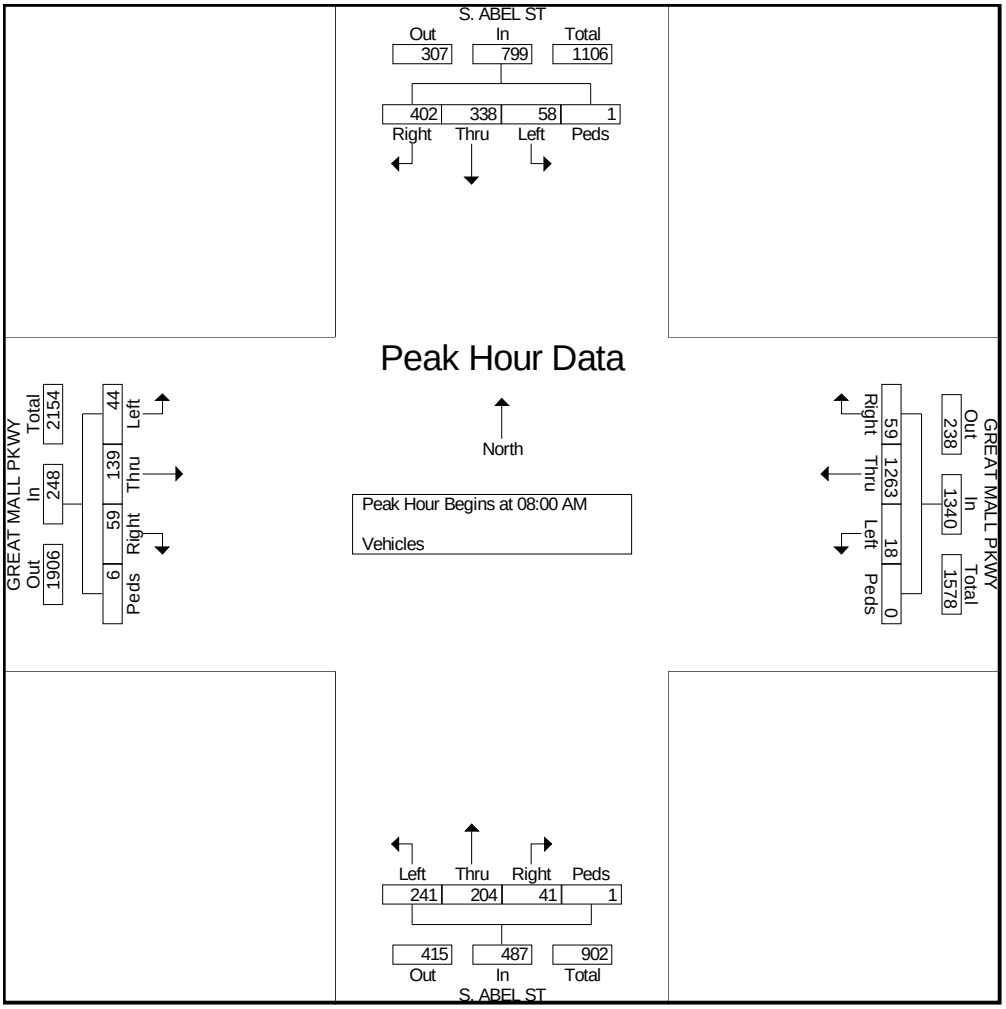

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Groups Printed- Vehicles

	S. ABEL ST Southbound					GREAT MALL PKWY Westbound					S. ABEL ST Northbound					GREAT MALL PKWY Eastbound					
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	25	49	18	1	93	18	126	10	0	154	16	57	9	0	82	29	197	35	1	262	591
04:15 PM	26	44	22	0	92	25	92	14	0	131	12	57	10	1	80	36	204	65	0	305	608
04:30 PM	21	40	30	0	91	25	102	13	2	142	11	69	12	0	92	47	241	77	2	367	692
04:45 PM	17	60	36	0	113	26	118	6	0	150	15	83	16	0	114	44	273	80	0	397	774
Total	89	193	106	1	389	94	438	43	2	577	54	266	47	1	368	156	915	257	3	1331	2665
05:00 PM	19	62	35	0	116	32	110	10	1	153	9	86	17	1	113	61	264	69	1	395	777
05:15 PM	21	75	20	1	117	23	107	8	0	138	13	95	19	0	127	56	389	126	0	571	953
05:30 PM	21	69	38	0	128	16	95	6	0	117	12	103	19	0	134	78	344	115	0	537	916
05:45 PM	17	66	22	0	105	23	102	13	0	138	13	108	15	0	136	61	347	108	1	517	896
Total	78	272	115	1	466	94	414	37	1	546	47	392	70	1	510	256	1344	418	2	2020	3542
Grand Total	167	465	221	2	855	188	852	80	3	1123	101	658	117	2	878	412	2259	675	5	3351	6207
Apprch %	19.5	54.4	25.8	0.2		16.7	75.9	7.1	0.3		11.5	74.9	13.3	0.2		12.3	67.4	20.1	0.1		
Total %	2.7	7.5	3.6	0	13.8	3	13.7	1.3	0	18.1	1.6	10.6	1.9	0	14.1	6.6	36.4	10.9	0.1	54	

	S. ABEL ST Southbound					GREAT MALL PKWY Westbound					S. ABEL ST Northbound					GREAT MALL PKWY Eastbound					
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	19	62	35	0	116	32	110	10	1	153	9	86	17	1	113	61	264	69	1	395	777
05:15 PM	21	75	20	1	117	23	107	8	0	138	13	95	19	0	127	56	389	126	0	571	953
05:30 PM	21	69	38	0	128	16	95	6	0	117	12	103	19	0	134	78	344	115	0	537	916
05:45 PM	17	66	22	0	105	23	102	13	0	138	13	108	15	0	136	61	347	108	1	517	896
Total Volume	78	272	115	1	466	94	414	37	1	546	47	392	70	1	510	256	1344	418	2	2020	3542
% App. Total																					
PHF	.929	.907	.757	.250	.910	.734	.941	.712	.250	.892	.904	.907	.921	.250	.938	.821	.864	.829	.500	.884	.929

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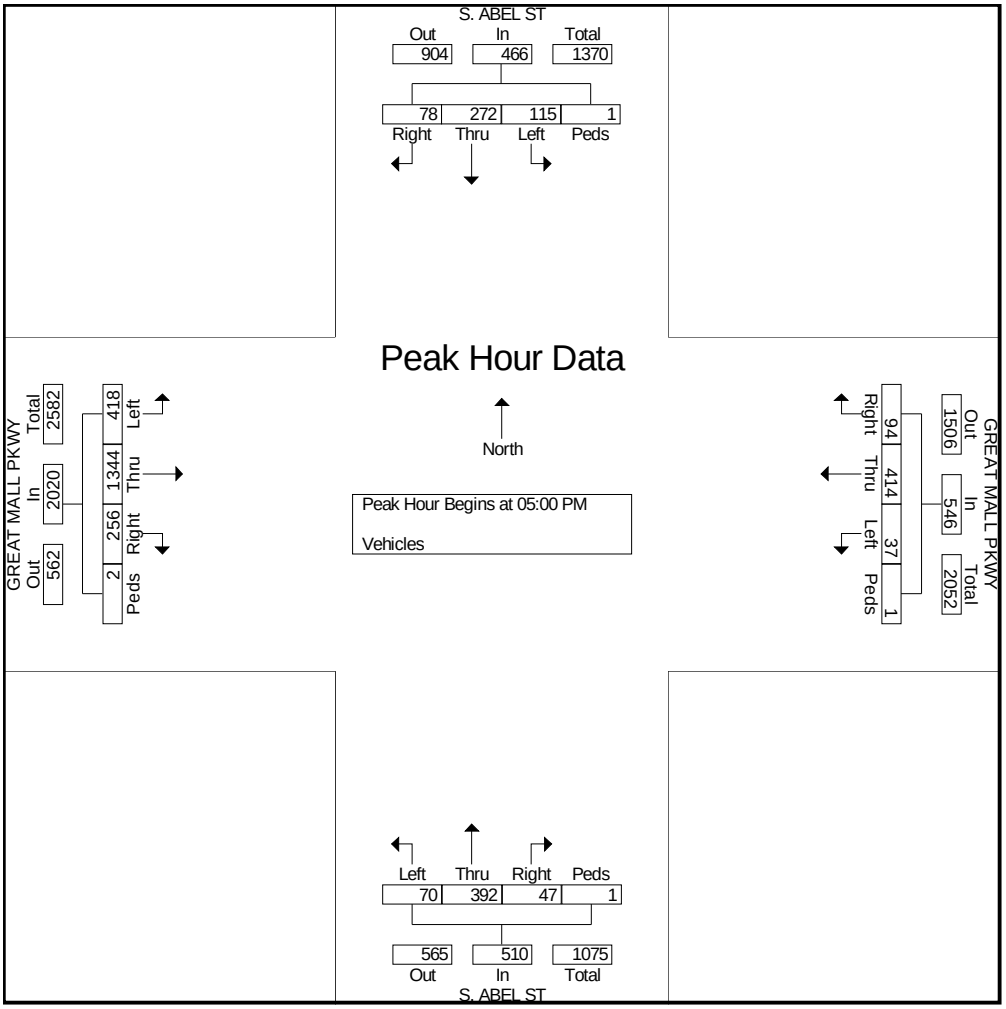

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Groups Printed- Vehicles

	MAIN ST Southbound					GREAT MALL PKWY Westbound					MAIN ST Northbound					GREAT MALL PKWY Eastbound					
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	19	15	7	0	41	6	127	4	2	139	4	4	2	0	10	0	23	5	0	28	218
07:15 AM	20	11	9	0	40	24	200	5	7	236	2	14	3	0	19	0	40	8	0	48	343
07:30 AM	28	21	17	3	69	18	236	4	9	267	4	17	2	0	23	0	51	6	1	58	417
07:45 AM	18	40	27	1	86	29	269	7	1	306	2	18	3	1	24	0	66	17	3	86	502
Total	85	87	60	4	236	77	832	20	19	948	12	53	10	1	76	0	180	36	4	220	1480
08:00 AM	17	26	26	4	73	35	293	13	1	342	4	28	4	0	36	2	57	12	0	71	522
08:15 AM	24	50	26	1	101	32	342	19	1	394	5	22	2	0	29	0	58	9	0	67	591
08:30 AM	23	76	29	2	130	23	359	33	1	416	13	21	2	0	36	0	46	8	0	54	636
08:45 AM	24	32	22	1	79	30	338	17	3	388	12	34	3	0	49	0	51	13	0	64	580
Total	88	184	103	8	383	120	1332	82	6	1540	34	105	11	0	150	2	212	42	0	256	2329
Grand Total	173	271	163	12	619	197	2164	102	25	2488	46	158	21	1	226	2	392	78	4	476	3809
Apprch %	27.9	43.8	26.3	1.9		7.9	87	4.1	1		20.4	69.9	9.3	0.4		0.4	82.4	16.4	0.8		
Total %	4.5	7.1	4.3	0.3	16.3	5.2	56.8	2.7	0.7	65.3	1.2	4.1	0.6	0	5.9	0.1	10.3	2	0.1	12.5	

	MAIN ST Southbound					GREAT MALL PKWY Westbound					MAIN ST Northbound					GREAT MALL PKWY Eastbound					
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	17	26	26	4	73	35	293	13	1	342	4	28	4	0	36	2	57	12	0	71	522
08:15 AM	24	50	26	1	101	32	342	19	1	394	5	22	2	0	29	0	58	9	0	67	591
08:30 AM	23	76	29	2	130	23	359	33	1	416	13	21	2	0	36	0	46	8	0	54	636
08:45 AM	24	32	22	1	79	30	338	17	3	388	12	34	3	0	49	0	51	13	0	64	580
Total Volume	88	184	103	8	383	120	1332	82	6	1540	34	105	11	0	150	2	212	42	0	256	2329
% App. Total																					
PHF	.917	.605	.888	.500	.737	.857	.928	.621	.500	.925	.654	.772	.688	.000	.765	.250	.914	.808	.000	.901	.915

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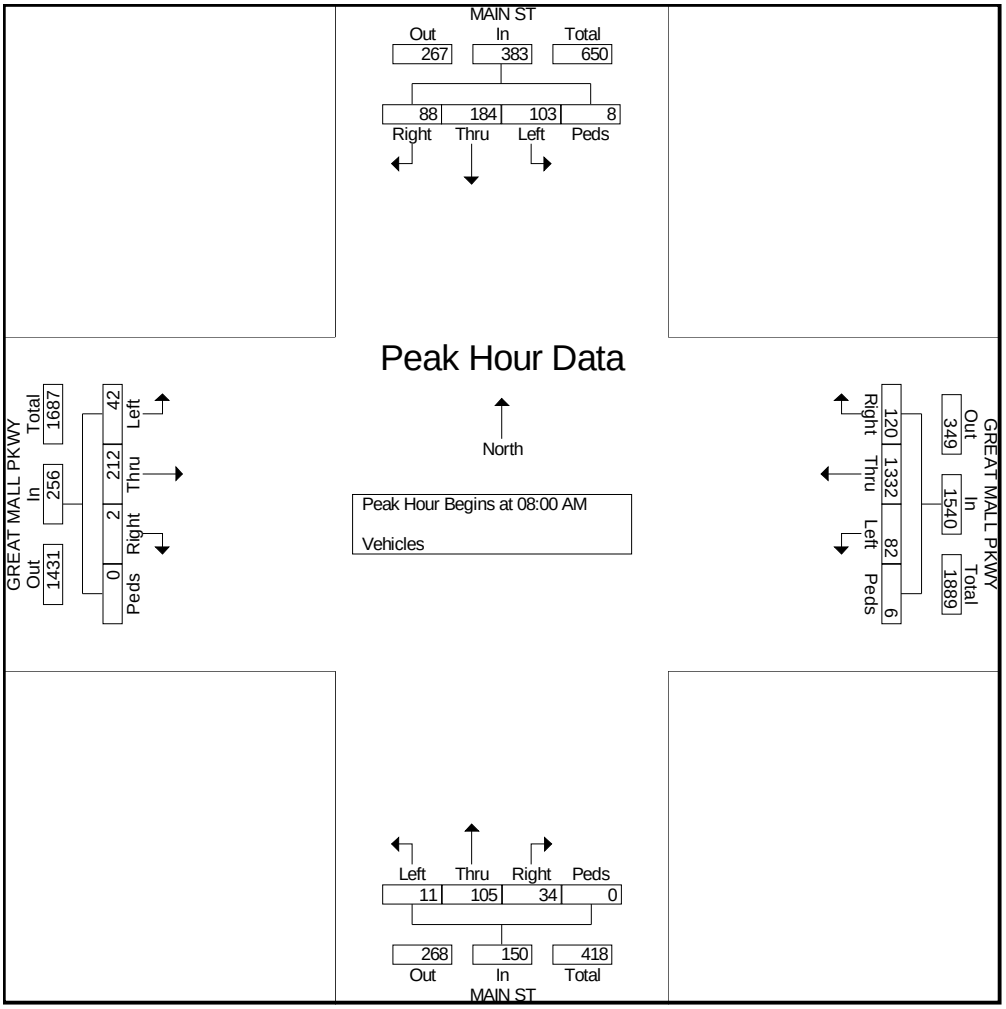

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Groups Printed- Vehicles

	MAIN ST Southbound					GREAT MALL PKWY Westbound					MAIN ST Northbound					GREAT MALL PKWY Eastbound					
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	25	16	52	0	93	17	110	9	0	136	6	41	6	0	53	2	177	14	0	193	475
04:15 PM	32	26	43	1	102	43	100	5	0	148	9	37	1	1	48	5	191	40	0	236	534
04:30 PM	34	24	43	1	102	39	124	13	1	177	14	34	6	1	55	1	217	37	0	255	589
04:45 PM	21	44	79	1	145	37	96	17	0	150	17	39	2	2	60	1	276	54	1	332	687
Total	112	110	217	3	442	136	430	44	1	611	46	151	15	4	216	9	861	145	1	1016	2285
05:00 PM	24	33	55	0	112	49	118	12	0	179	11	36	0	1	48	1	278	29	0	308	647
05:15 PM	26	31	60	0	117	51	112	10	0	173	6	47	2	1	56	1	380	50	3	434	780
05:30 PM	23	25	58	6	112	51	99	8	2	160	8	53	2	3	66	4	336	46	5	391	729
05:45 PM	30	27	50	0	107	44	94	5	0	143	13	53	2	3	71	3	357	47	4	411	732
Total	103	116	223	6	448	195	423	35	2	655	38	189	6	8	241	9	1351	172	12	1544	2888
Grand Total	215	226	440	9	890	331	853	79	3	1266	84	340	21	12	457	18	2212	317	13	2560	5173
Apprch %	24.2	25.4	49.4	1		26.1	67.4	6.2	0.2		18.4	74.4	4.6	2.6		0.7	86.4	12.4	0.5		
Total %	4.2	4.4	8.5	0.2	17.2	6.4	16.5	1.5	0.1	24.5	1.6	6.6	0.4	0.2	8.8	0.3	42.8	6.1	0.3	49.5	

	MAIN ST Southbound					GREAT MALL PKWY Westbound					MAIN ST Northbound					GREAT MALL PKWY Eastbound					
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	24	33	55	0	112	49	118	12	0	179	11	36	0	1	48	1	278	29	0	308	647
05:15 PM	26	31	60	0	117	51	112	10	0	173	6	47	2	1	56	1	380	50	3	434	780
05:30 PM	23	25	58	6	112	51	99	8	2	160	8	53	2	3	66	4	336	46	5	391	729
05:45 PM	30	27	50	0	107	44	94	5	0	143	13	53	2	3	71	3	357	47	4	411	732
Total Volume	103	116	223	6	448	195	423	35	2	655	38	189	6	8	241	9	1351	172	12	1544	2888
% App. Total																					
PHF	.858	.879	.929	.250	.957	.956	.896	.729	.250	.915	.731	.892	.750	.667	.849	.563	.889	.860	.600	.889	.926

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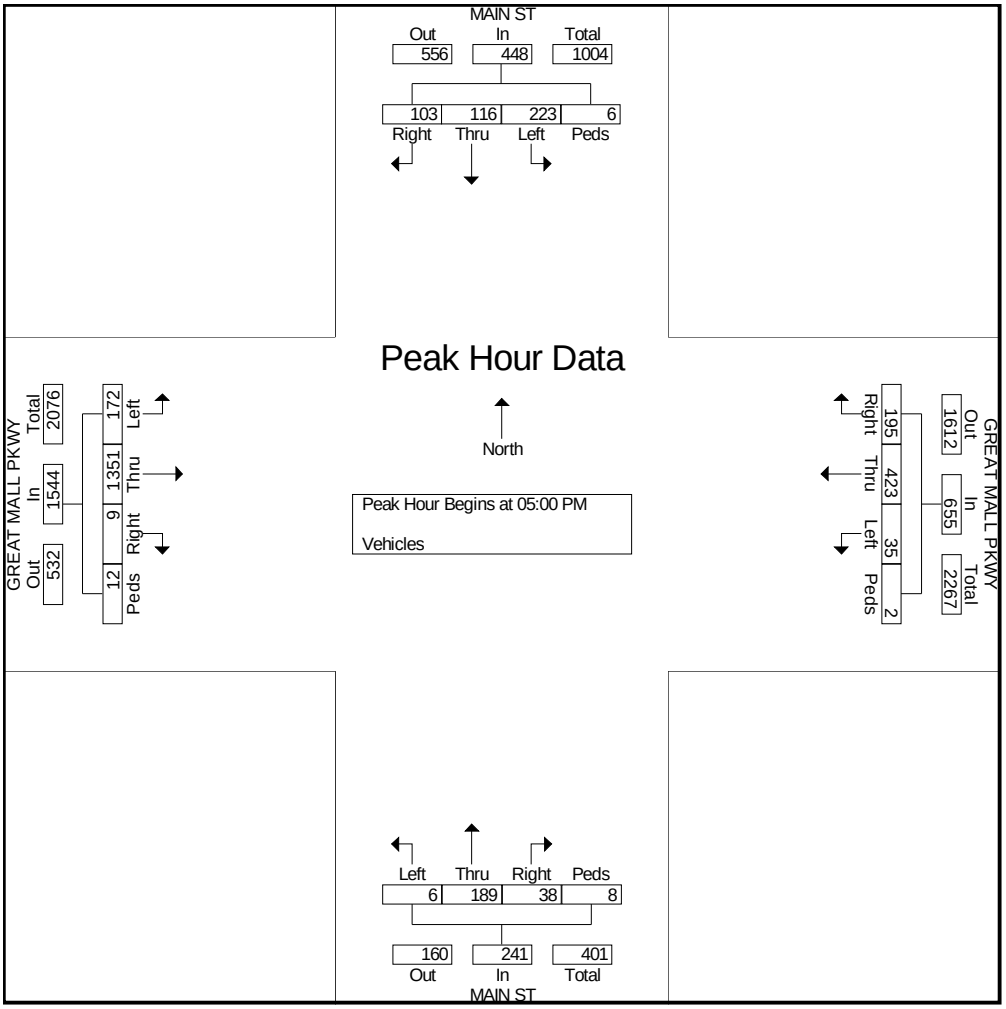

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Groups Printed- Vehicles

	FAIRLANE DR Southbound					GREAT MALL PKWY Westbound					MC CANDLESS DR Northbound					GREAT MALL PKWY Eastbound					
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	10	3	8	0	21	17	143	1	0	161	1	1	3	0	5	7	30	12	0	49	236
07:15 AM	11	3	13	2	29	11	191	0	1	203	0	2	1	1	4	5	40	12	0	57	293
07:30 AM	14	8	16	1	39	20	262	0	0	282	0	2	2	1	5	8	63	13	0	84	410
07:45 AM	17	2	28	3	50	22	293	1	0	316	1	3	3	0	7	8	79	20	1	108	481
Total	52	16	65	6	139	70	889	2	1	962	2	8	9	2	21	28	212	57	1	298	1420
08:00 AM	17	10	21	0	48	34	322	1	0	357	0	5	5	0	10	9	78	13	0	100	515
08:15 AM	23	4	22	1	50	29	355	2	0	386	0	4	5	0	9	6	77	22	0	105	550
08:30 AM	24	9	29	0	62	24	364	2	2	392	1	0	6	0	7	8	61	11	2	82	543
08:45 AM	11	17	19	2	49	27	382	4	3	416	2	5	2	2	11	18	66	16	2	102	578
Total	75	40	91	3	209	114	1423	9	5	1551	3	14	18	2	37	41	282	62	4	389	2186
Grand Total	127	56	156	9	348	184	2312	11	6	2513	5	22	27	4	58	69	494	119	5	687	3606
Apprch %	36.5	16.1	44.8	2.6		7.3	92	0.4	0.2		8.6	37.9	46.6	6.9		10	71.9	17.3	0.7		
Total %	3.5	1.6	4.3	0.2	9.7	5.1	64.1	0.3	0.2	69.7	0.1	0.6	0.7	0.1	1.6	1.9	13.7	3.3	0.1	19.1	

	FAIRLANE DR Southbound					GREAT MALL PKWY Westbound					MC CANDLESS DR Northbound					GREAT MALL PKWY Eastbound					
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	17	10	21	0	48	34	322	1	0	357	0	5	5	0	10	9	78	13	0	100	515
08:15 AM	23	4	22	1	50	29	355	2	0	386	0	4	5	0	9	6	77	22	0	105	550
08:30 AM	24	9	29	0	62	24	364	2	2	392	1	0	6	0	7	8	61	11	2	82	543
08:45 AM	11	17	19	2	49	27	382	4	3	416	2	5	2	2	11	18	66	16	2	102	578
Total Volume	75	40	91	3	209	114	1423	9	5	1551	3	14	18	2	37	41	282	62	4	389	2186
% App. Total																					
PHF	.781	.588	.784	.375	.843	.838	.931	.563	.417	.932	.375	.700	.750	.250	.841	.569	.904	.705	.500	.926	.946

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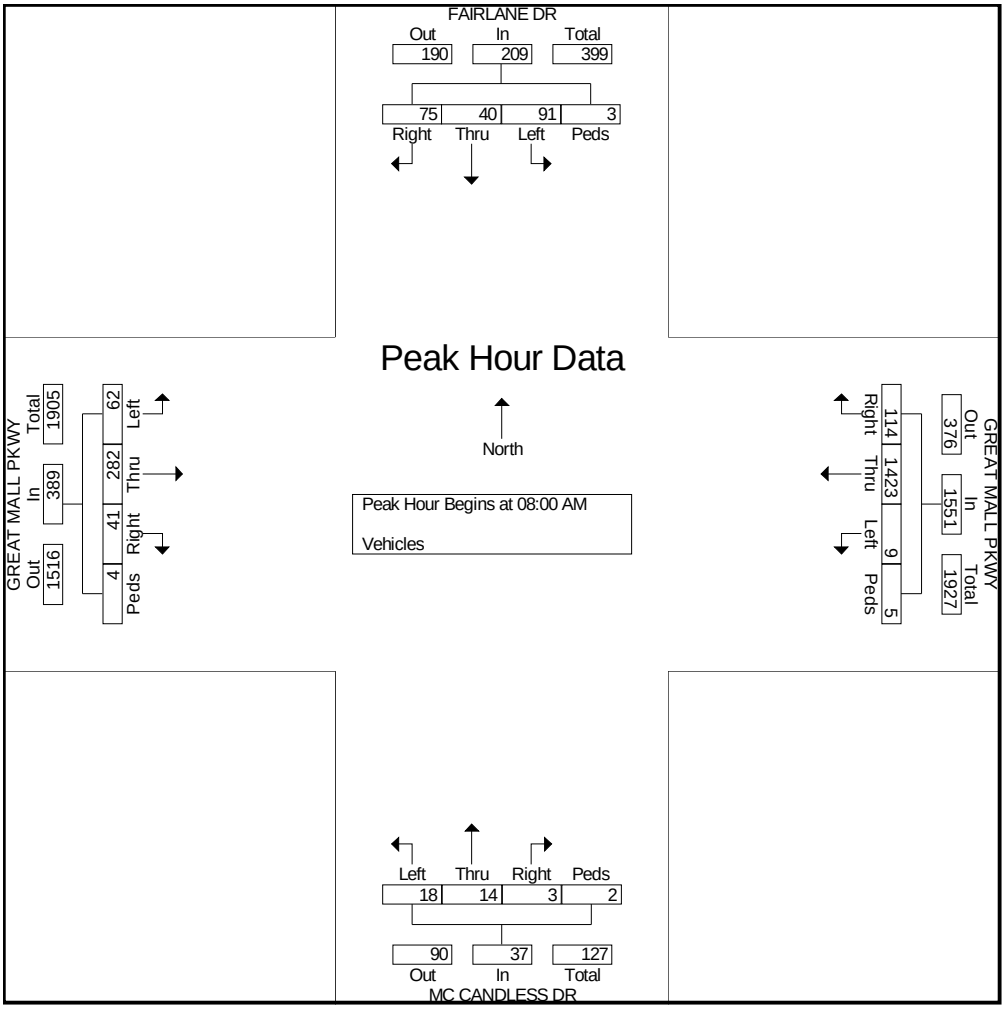

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Groups Printed- Vehicles

	FAIRLANE DR Southbound					GREAT MALL PKWY Westbound					MC CANDLESS DR Northbound					GREAT MALL PKWY Eastbound					
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	40	14	76	0	130	24	106	1	1	132	2	7	4	0	13	6	165	49	0	220	495
04:15 PM	41	16	71	2	130	33	95	1	0	129	0	14	14	0	28	16	229	67	0	312	599
04:30 PM	39	7	66	0	112	33	118	2	0	153	3	6	7	0	16	11	218	61	0	290	571
04:45 PM	47	23	59	1	130	17	99	0	0	116	4	23	8	0	35	12	250	62	0	324	605
Total	167	60	272	3	502	107	418	4	1	530	9	50	33	0	92	45	862	239	0	1146	2270
05:00 PM	39	13	63	1	116	24	124	2	0	150	3	8	7	0	18	15	294	53	0	362	646
05:15 PM	48	6	57	1	112	41	113	0	0	154	6	9	5	0	20	19	362	49	1	431	717
05:30 PM	46	16	78	2	142	28	126	1	1	156	6	19	11	0	36	10	324	54	1	389	723
05:45 PM	35	13	59	0	107	33	124	2	0	159	7	8	8	0	23	18	313	46	2	379	668
Total	168	48	257	4	477	126	487	5	1	619	22	44	31	0	97	62	1293	202	4	1561	2754
Grand Total	335	108	529	7	979	233	905	9	2	1149	31	94	64	0	189	107	2155	441	4	2707	5024
Apprch %	34.2	11	54	0.7		20.3	78.8	0.8	0.2		16.4	49.7	33.9	0		4	79.6	16.3	0.1		
Total %	6.7	2.1	10.5	0.1	19.5	4.6	18	0.2	0	22.9	0.6	1.9	1.3	0	3.8	2.1	42.9	8.8	0.1	53.9	

	FAIRLANE DR Southbound					GREAT MALL PKWY Westbound					MC CANDLESS DR Northbound					GREAT MALL PKWY Eastbound					
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	39	13	63	1	116	24	124	2	0	150	3	8	7	0	18	15	294	53	0	362	646
05:15 PM	48	6	57	1	112	41	113	0	0	154	6	9	5	0	20	19	362	49	1	431	717
05:30 PM	46	16	78	2	142	28	126	1	1	156	6	19	11	0	36	10	324	54	1	389	723
05:45 PM	35	13	59	0	107	33	124	2	0	159	7	8	8	0	23	18	313	46	2	379	668
Total Volume	168	48	257	4	477	126	487	5	1	619	22	44	31	0	97	62	1293	202	4	1561	2754
% App. Total																					
PHF	.875	.750	.824	.500	.840	.768	.966	.625	.250	.973	.786	.579	.705	.000	.674	.816	.893	.935	.500	.905	.952

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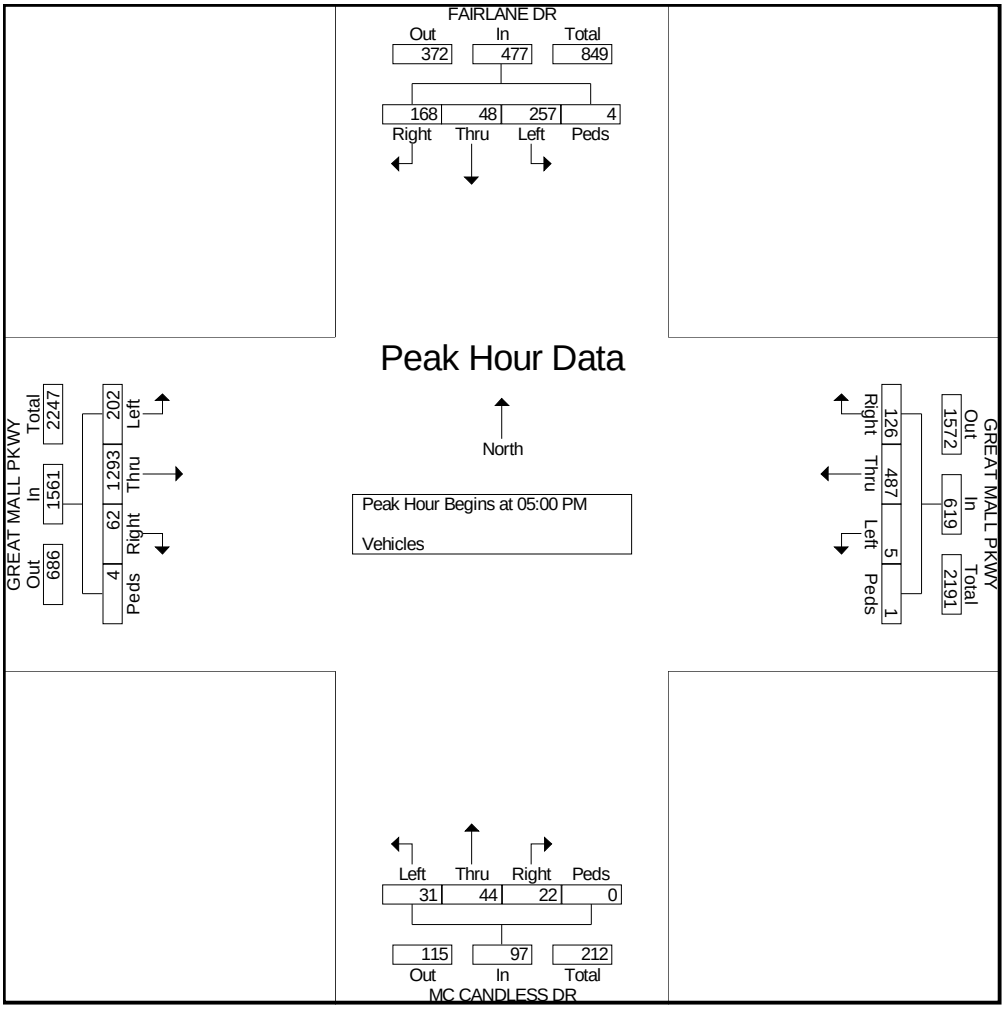

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Groups Printed- Vehicles

	MUSTANG DR Southbound					GREAT MALL PKWY Westbound					CENTRE POINTE DR Northbound					GREAT MALL PKWY Eastbound					
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	1	2	11	3	17	11	162	3	0	176	0	0	0	0	0	0	38	2	0	40	233
07:15 AM	4	0	10	4	18	21	207	3	0	231	1	0	0	0	1	1	43	3	0	47	297
07:30 AM	7	2	9	4	22	25	259	2	0	286	0	0	0	0	0	5	69	5	0	79	387
07:45 AM	4	2	14	3	23	66	316	5	0	387	0	1	1	0	2	2	94	10	0	106	518
Total	16	6	44	14	80	123	944	13	0	1080	1	1	1	0	3	8	244	20	0	272	1435
08:00 AM	12	2	16	0	30	58	357	4	0	419	0	0	0	0	0	2	91	8	0	101	550
08:15 AM	3	1	12	0	16	20	351	3	0	374	2	0	1	0	3	3	87	3	0	93	486
08:30 AM	3	1	15	1	20	27	373	3	0	403	0	0	3	0	3	2	79	4	0	85	511
08:45 AM	1	0	12	4	17	30	428	5	0	463	1	0	1	0	2	2	77	3	0	82	564
Total	19	4	55	5	83	135	1509	15	0	1659	3	0	5	0	8	9	334	18	0	361	2111
Grand Total	35	10	99	19	163	258	2453	28	0	2739	4	1	6	0	11	17	578	38	0	633	3546
Apprch %	21.5	6.1	60.7	11.7		9.4	89.6	1	0		36.4	9.1	54.5	0		2.7	91.3	6	0		
Total %	1	0.3	2.8	0.5	4.6	7.3	69.2	0.8	0	77.2	0.1	0	0.2	0	0.3	0.5	16.3	1.1	0	17.9	

	MUSTANG DR Southbound					GREAT MALL PKWY Westbound					CENTRE POINTE DR Northbound					GREAT MALL PKWY Eastbound					
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	12	2	16	0	30	58	357	4	0	419	0	0	0	0	0	2	91	8	0	101	550
08:15 AM	3	1	12	0	16	20	351	3	0	374	2	0	1	0	3	3	87	3	0	93	486
08:30 AM	3	1	15	1	20	27	373	3	0	403	0	0	3	0	3	2	79	4	0	85	511
08:45 AM	1	0	12	4	17	30	428	5	0	463	1	0	1	0	2	2	77	3	0	82	564
Total Volume	19	4	55	5	83	135	1509	15	0	1659	3	0	5	0	8	9	334	18	0	361	2111
% App. Total																					
PHF	.396	.500	.859	.313	.692	.582	.881	.750	.000	.896	.375	.000	.417	.000	.667	.750	.918	.563	.000	.894	.936

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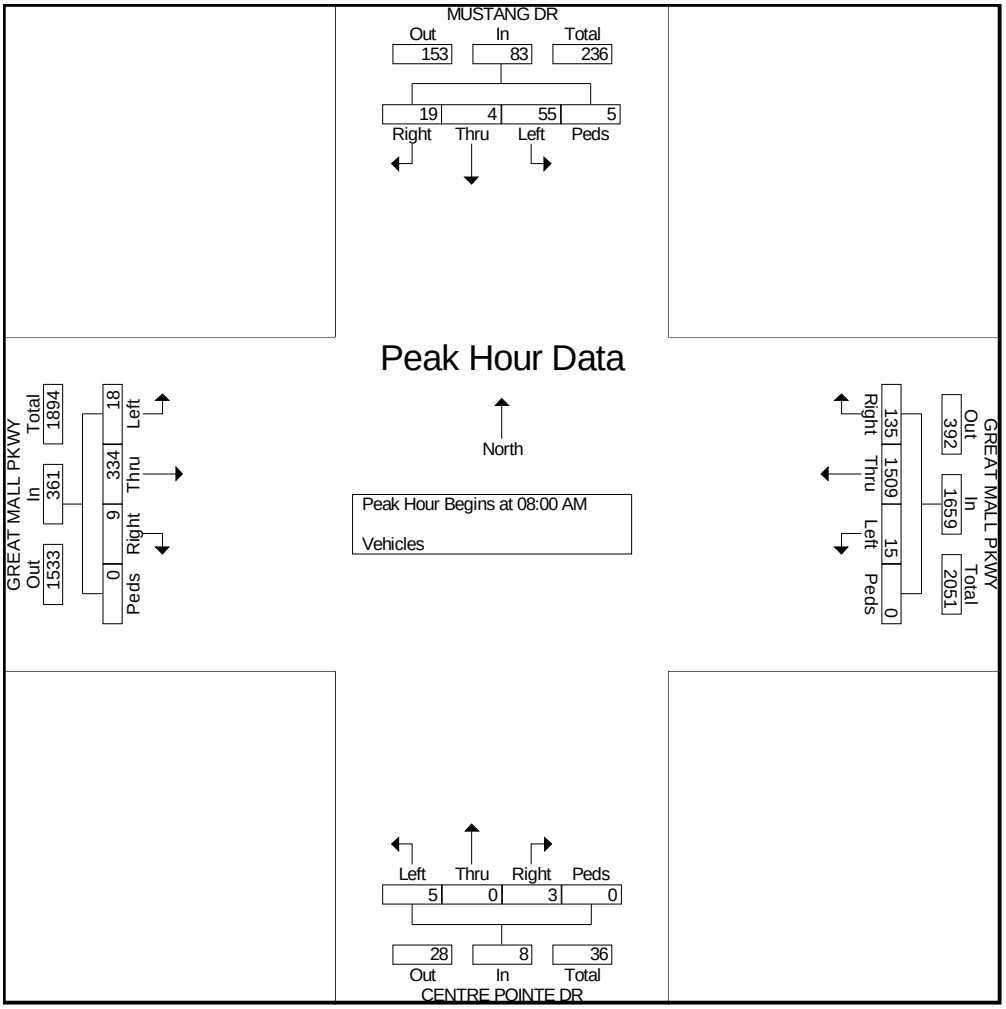

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Groups Printed- Vehicles

	MUSTANG DR Southbound					GREAT MALL PKWY Westbound					CENTRE POINTE DR Northbound					GREAT MALL PKWY Eastbound					
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	18	0	113	4	135	57	128	0	0	185	2	2	0	0	4	2	254	12	0	268	592
04:15 PM	20	3	101	2	126	58	110	5	0	173	2	0	2	0	4	2	277	7	0	286	589
04:30 PM	24	4	101	0	129	68	109	1	0	178	3	0	2	1	6	2	255	14	0	271	584
04:45 PM	14	3	79	1	97	90	115	1	4	210	4	0	4	0	8	5	296	16	0	317	632
Total	76	10	394	7	487	273	462	7	4	746	11	2	8	1	22	11	1082	49	0	1142	2397
05:00 PM	14	2	109	5	130	69	141	3	0	213	4	1	5	0	10	1	333	16	0	350	703
05:15 PM	14	2	75	4	95	54	138	3	0	195	0	0	0	1	1	2	408	4	1	415	706
05:30 PM	13	0	62	3	78	43	131	4	0	178	3	1	5	0	9	4	407	12	0	423	688
05:45 PM	9	5	71	2	87	68	146	5	0	219	3	0	0	0	3	5	367	10	0	382	691
Total	50	9	317	14	390	234	556	15	0	805	10	2	10	1	23	12	1515	42	1	1570	2788
Grand Total	126	19	711	21	877	507	1018	22	4	1551	21	4	18	2	45	23	2597	91	1	2712	5185
Apprch %	14.4	2.2	81.1	2.4		32.7	65.6	1.4	0.3		46.7	8.9	40	4.4		0.8	95.8	3.4	0		
Total %	2.4	0.4	13.7	0.4	16.9	9.8	19.6	0.4	0.1	29.9	0.4	0.1	0.3	0	0.9	0.4	50.1	1.8	0	52.3	

	MUSTANG DR Southbound					GREAT MALL PKWY Westbound					CENTRE POINTE DR Northbound					GREAT MALL PKWY Eastbound					
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	14	2	109	5	130	69	141	3	0	213	4	1	5	0	10	1	333	16	0	350	703
05:15 PM	14	2	75	4	95	54	138	3	0	195	0	0	0	1	1	2	408	4	1	415	706
05:30 PM	13	0	62	3	78	43	131	4	0	178	3	1	5	0	9	4	407	12	0	423	688
05:45 PM	9	5	71	2	87	68	146	5	0	219	3	0	0	0	3	5	367	10	0	382	691
Total Volume	50	9	317	14	390	234	556	15	0	805	10	2	10	1	23	12	1515	42	1	1570	2788
% App. Total																					
PHF	.893	.450	.727	.700	.750	.848	.952	.750	.000	.919	.625	.500	.500	.250	.575	.600	.928	.656	.250	.928	.987

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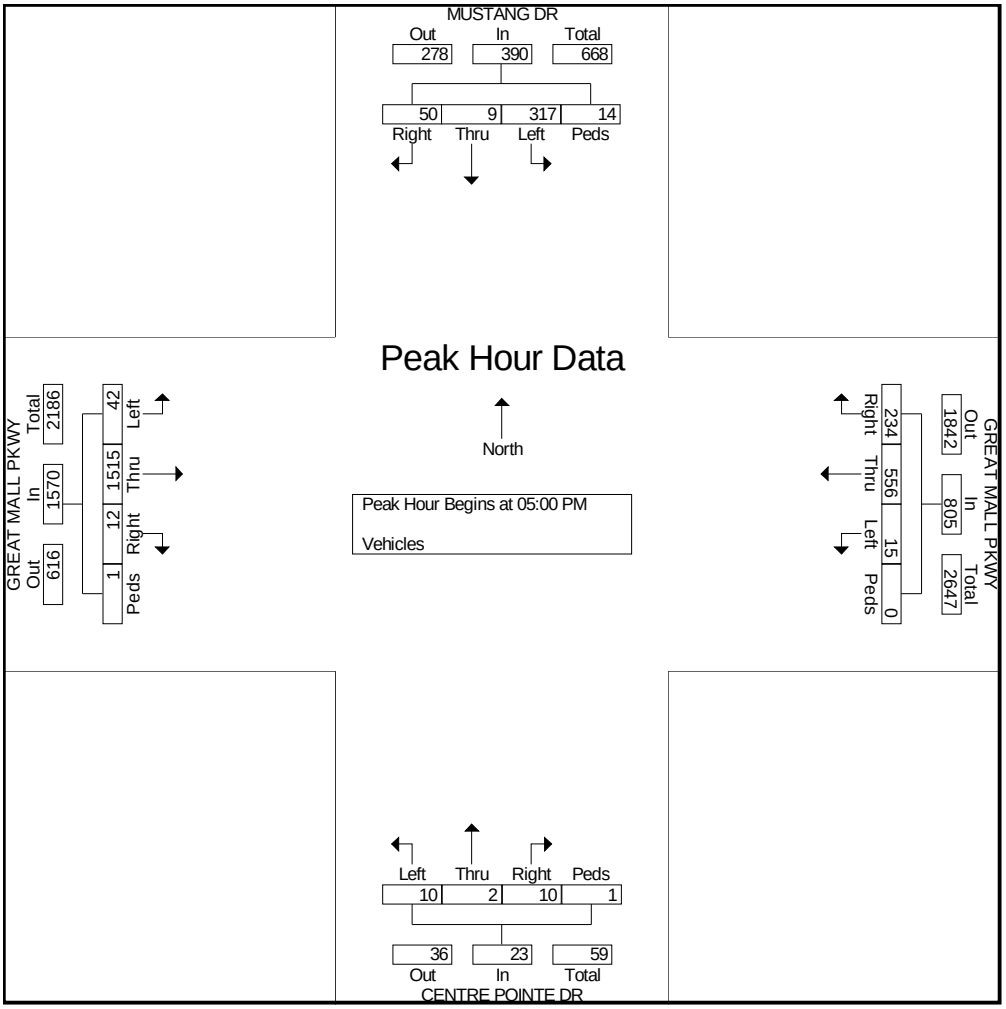

Appendix C – Level of Service Worksheets: Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1501	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1501	1583
Volume (vph)	0	134	108	257	2326	0	0	0	0	92	4	462
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	149	120	276	2501	0	0	0	0	103	4	519
RTOR Reduction (vph)	0	0	78	0	0	0	0	0	0	0	3	3
Lane Group Flow (vph)	0	149	42	276	2501	0	0	0	0	103	260	257
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		20.3	20.3	12.1	36.9					14.6	14.6	14.6
Effective Green, g (s)		21.8	21.8	11.6	38.4					15.6	15.6	15.6
Actuated g/C Ratio		0.35	0.35	0.19	0.62					0.25	0.25	0.25
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1882	586	349	3315					445	378	398
v/s Ratio Prot		0.03	0.03	0.15	c0.47					0.06	c0.17	0.16
v/s Ratio Perm												
v/c Ratio		0.08	0.07	0.79	0.75					0.23	0.69	0.65
Uniform Delay, d1		13.4	13.4	24.0	8.4					18.4	21.0	20.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	11.6	1.3					0.3	5.1	3.6
Delay (s)		13.5	13.5	35.6	9.8					18.7	26.1	24.3
Level of Service		B	B	D	A					B	C	C
Approach Delay (s)		13.5			12.3			0.0			24.2	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	1.00		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	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	5353	1632	1863	5326		1770	1782	1667	1770	1863	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5353	1632	1863	5326		1770	1782	1667	1770	1863	1667
Volume (vph)	24	140	52	167	1659	50	847	40	46	22	28	132
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.96	0.96	0.96	0.70	0.70	0.70
Adj. Flow (vph)	29	169	63	182	1803	54	882	42	48	31	40	189
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	27	0	0	16
Lane Group Flow (vph)	29	169	63	182	1855	0	450	474	21	31	40	173
Confl. Bikes (#/hr)			2			5						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	11.7	42.1	117.4	16.5	46.9		33.5	33.5	50.0	5.8	5.8	17.5
Effective Green, g (s)	11.2	43.6	117.4	16.0	48.4		34.5	34.5	51.5	5.3	5.3	16.5
Actuated g/C Ratio	0.10	0.37	1.00	0.14	0.41		0.29	0.29	0.44	0.05	0.05	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	178	1988	1632	254	2196		520	524	788	80	84	234
v/s Ratio Prot	0.02	0.03		c0.10	c0.35		0.25	c0.27	0.00	0.02	0.02	c0.07
v/s Ratio Perm			0.04						0.01			0.03
v/c Ratio	0.16	0.09	0.04	0.72	0.84		0.87	0.90	0.03	0.39	0.48	0.74
Uniform Delay, d1	48.8	24.0	0.0	48.5	31.1		39.3	39.9	18.7	54.5	54.7	48.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.0	9.3	3.7		13.9	19.0	0.0	5.3	7.2	11.5
Delay (s)	49.2	24.0	0.0	57.8	34.8		53.2	58.8	18.7	59.8	61.9	59.9
Level of Service	D	C	A	E	C		D	E	B	E	E	E
Approach Delay (s)		21.0			36.8			54.2			60.2	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.99	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	0.96		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)	3614	5081		1863	5353	1667	1863	3725	1648	1863	3725	1654
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5081		1863	5353	1667	1863	3725	1648	1863	3725	1654
Volume (vph)	44	139	59	18	1263	59	241	204	41	58	338	402
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	56	176	75	20	1388	65	287	243	49	63	367	437
RTOR Reduction (vph)	0	45	0	0	0	29	0	0	30	0	0	27
Lane Group Flow (vph)	56	206	0	20	1388	36	287	243	19	63	367	410
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	13.7	43.9		6.1	36.3	49.6	22.5	34.8	40.9	8.3	20.6	34.3
Effective Green, g (s)	14.7	44.9		7.1	37.3	49.6	22.5	36.8	43.9	8.3	22.6	37.3
Actuated g/C Ratio	0.13	0.40		0.06	0.33	0.44	0.20	0.33	0.39	0.07	0.20	0.33
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	470	2017		117	1765	731	371	1212	698	137	744	604
v/s Ratio Prot	0.02	0.04		0.01	c0.26	0.02	c0.15	0.07	0.00	0.03	0.10	c0.09
v/s Ratio Perm									0.01			0.16
v/c Ratio	0.12	0.10		0.17	0.79	0.05	0.77	0.20	0.03	0.46	0.49	0.68
Uniform Delay, d1	43.5	21.4		50.2	34.3	18.2	42.9	27.5	21.4	50.3	40.2	32.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.9	3.0	0.1	10.2	0.1	0.0	3.3	1.5	4.0
Delay (s)	43.7	21.5		51.2	37.3	18.3	53.1	27.6	21.4	53.6	41.6	36.7
Level of Service	D	C		D	D	B	D	C	C	D	D	D
Approach Delay (s)		25.5			36.6			39.7			40.0	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	113.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	42	212	2	82	1332	120	11	105	34	103	184	88
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.73	0.73	0.73
Adj. Flow (vph)	47	236	2	89	1448	130	14	136	44	141	252	121
RTOR Reduction (vph)	0	0	0	0	0	19	0	0	33	0	0	68
Lane Group Flow (vph)	47	238	0	89	1448	111	14	136	11	141	252	53
Confl. Peds. (#/hr)	6					6	8					8
Confl. Bikes (#/hr)						7			2			
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	8.4	62.7		9.5	63.8	86.0	3.7	15.7	30.2	17.2	27.7	41.1
Effective Green, g (s)	7.9	63.7		10.0	64.8	87.5	7.7	16.7	30.7	21.2	28.7	41.6
Actuated g/C Ratio	0.06	0.51		0.08	0.52	0.70	0.06	0.13	0.25	0.17	0.23	0.33
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	118	2722		149	2773	1166	115	497	409	316	855	554
v/s Ratio Prot	0.03	0.04		c0.05	c0.27	0.07	0.01	0.04	0.01	c0.08	c0.07	0.03
v/s Ratio Perm												
v/c Ratio	0.40	0.09		0.60	0.52	0.09	0.12	0.27	0.03	0.45	0.29	0.10
Uniform Delay, d1	56.3	15.8		55.6	19.9	6.1	55.5	48.7	35.8	46.7	39.8	28.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1		6.3	0.7	0.1	0.6	0.5	0.0	2.8	0.4	0.2
Delay (s)	58.5	15.8		61.9	20.6	6.2	56.2	49.3	35.9	49.5	40.2	28.9
Level of Service	E	B		E	C	A	E	D	D	D	D	C
Approach Delay (s)		22.9			21.7			46.7			40.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	125.1	Sum of lost time (s)	5.5
Intersection Capacity Utilization	53.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	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	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1617	1863	5353	1635	1863	3630		3614	1961	1643
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1617	1863	5353	1635	1863	3630		3614	1961	1643
Volume (vph)	62	282	41	9	1423	114	18	14	3	91	40	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.83	0.83	0.83
Adj. Flow (vph)	67	307	45	10	1514	121	20	16	3	110	48	90
RTOR Reduction (vph)	0	0	15	0	0	27	0	3	0	0	0	79
Lane Group Flow (vph)	67	307	30	10	1514	94	20	16	0	110	48	11
Confl. Peds. (#/hr)	5		4	4		5	3		2	2		3
Confl. Bikes (#/hr)			1			3						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	6.7	69.2	69.2	1.1	63.6	63.6	2.9	7.7		8.0	13.3	13.3
Effective Green, g (s)	6.7	70.2	70.2	1.1	64.6	64.6	2.4	7.2		9.0	12.8	12.8
Actuated g/C Ratio	0.06	0.67	0.67	0.01	0.62	0.62	0.02	0.07		0.09	0.12	0.12
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	232	3596	1086	20	3309	1011	43	250		311	240	201
v/s Ratio Prot	c0.02	0.06		0.01	c0.28		0.01	0.00		c0.03	c0.02	
v/s Ratio Perm			0.02			0.06						0.01
v/c Ratio	0.29	0.09	0.03	0.50	0.46	0.09	0.47	0.06		0.35	0.20	0.05
Uniform Delay, d1	46.6	6.0	5.7	51.4	10.6	8.1	50.4	45.5		45.0	41.2	40.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.0	18.3	0.5	0.2	7.8	0.1		0.7	0.4	0.1
Delay (s)	47.3	6.0	5.8	69.7	11.1	8.3	58.2	45.6		45.7	41.7	40.6
Level of Service	D	A	A	E	B	A	E	D		D	D	D
Approach Delay (s)		12.6			11.2			52.1			43.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	67	307	45	10	1514	121	20	19	110	48	90
v/c Ratio	0.24	0.08	0.04	0.09	0.45	0.11	0.17	0.05	0.29	0.18	0.29
Control Delay	45.5	9.2	5.5	53.1	15.0	7.8	51.6	31.3	42.5	33.9	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	9.2	5.5	53.1	15.0	7.8	51.6	31.3	42.5	33.9	9.3
Queue Length 50th (ft)	14	9	0	4	117	8	9	3	23	20	0
Queue Length 95th (ft)	54	84	25	29	474	71	45	14	72	54	31
Internal Link Dist (ft)		967			784			389		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	807	3870	1175	253	3401	1061	172	1271	720	817	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08	0.04	0.04	0.45	0.11	0.12	0.01	0.15	0.06	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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
Frt	1.00	1.00		1.00	1.00	0.85	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		0.95	1.00	1.00
Satd. Flow (prot)	1863	5329		1863	5353	1629	1863	1667		3614	1961	1643
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5329		1863	5353	1629	1863	1667		3614	1961	1643
Volume (vph)	18	334	9	15	1509	135	5	0	3	55	4	19
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.67	0.67	0.67	0.65	0.65	0.65
Adj. Flow (vph)	20	375	10	17	1677	150	7	0	4	85	6	29
RTOR Reduction (vph)	0	2	0	0	0	42	0	4	0	0	0	25
Lane Group Flow (vph)	20	383	0	17	1677	108	7	0	0	85	6	4
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			1			4						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	0.6	30.8		0.6	30.8	30.8	0.6	3.6		3.7	7.2	7.2
Effective Green, g (s)	1.1	31.8		1.1	31.8	31.8	1.1	3.6		4.7	7.2	7.2
Actuated g/C Ratio	0.02	0.56		0.02	0.56	0.56	0.02	0.06		0.08	0.13	0.13
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	36	2963		36	2976	906	36	105		297	247	207
v/s Ratio Prot	c0.01	0.07		0.01	c0.31		0.00	0.00		c0.02	c0.00	
v/s Ratio Perm						0.07						0.00
v/c Ratio	0.56	0.13		0.47	0.56	0.12	0.19	0.00		0.29	0.02	0.02
Uniform Delay, d1	27.8	6.1		27.8	8.2	6.0	27.6	25.1		24.7	21.9	21.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.1	0.0		3.5	0.4	0.1	1.9	0.0		0.4	0.0	0.0
Delay (s)	37.9	6.1		31.3	8.6	6.1	29.5	25.1		25.1	21.9	21.9
Level of Service	D	A		C	A	A	C	C		C	C	C
Approach Delay (s)		7.7			8.6			27.9			24.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86		0.91	1.00	0.97	1.00
Frt	1.00	1.00		1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745		5353	1667	3614	1667
Flt Permitted	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745		5353	1667	3614	1667
Volume (vph)	296	647	0	2478	447	45	290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	322	703	0	2693	486	49	315
RTOR Reduction (vph)	0	0	0	0	27	0	0
Lane Group Flow (vph)	322	703	0	2693	459	49	315
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	21.7	167.5		141.8	141.8	11.9	190.0
Effective Green, g (s)	21.7	168.8		143.1	143.1	13.2	190.0
Actuated g/C Ratio	0.11	0.89		0.75	0.75	0.07	1.00
Clearance Time (s)	4.0	5.3		5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	3.0	
Lane Grp Cap (vph)	413	5992		4032	1256	251	1667
v/s Ratio Prot	c0.09	0.10		c0.50		0.01	
v/s Ratio Perm					0.28		c0.19
v/c Ratio	0.78	0.12		0.67	0.37	0.20	0.19
Uniform Delay, d1	81.8	1.3		11.6	8.0	83.4	0.0
Progression Factor	0.88	1.64		1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	0.0		0.9	0.8	0.4	0.3
Delay (s)	80.6	2.2		12.5	8.8	83.8	0.3
Level of Service	F	A		B	A	F	A
Approach Delay (s)		26.8		12.0		11.5	
Approach LOS		C		B		B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5239	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5239	
Volume (vph)	98	541	14	32	1505	816	546	606	41	221	78	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	588	15	35	1636	887	593	659	45	240	85	14
RTOR Reduction (vph)	0	0	0	0	0	160	0	0	35	0	12	0
Lane Group Flow (vph)	107	588	15	35	1636	727	593	659	10	240	87	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	11.0	105.5	190.0	6.6	101.1	101.1	26.5	39.4	39.4	17.2	30.1	
Effective Green, g (s)	12.5	106.8	190.0	8.1	102.4	102.4	28.0	40.4	40.4	18.7	31.1	
Actuated g/C Ratio	0.07	0.56	1.00	0.04	0.54	0.54	0.15	0.21	0.21	0.10	0.16	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	238	3791	1667	154	3635	898	533	792	354	356	858	
v/s Ratio Prot	c0.03	0.09		0.01	0.24		c0.16	c0.18		0.07	0.02	
v/s Ratio Perm			0.01			c0.44			0.01			
v/c Ratio	0.45	0.16	0.01	0.23	0.45	0.81	1.11	0.83	0.03	0.67	0.10	
Uniform Delay, d1	85.4	20.0	0.0	87.9	26.7	35.8	81.0	71.6	59.2	82.7	67.6	
Progression Factor	1.08	0.80	1.00	1.25	0.59	0.53	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.1	0.0	0.6	0.3	6.3	73.6	7.8	0.0	5.0	0.1	
Delay (s)	93.3	16.0	0.0	110.5	16.0	25.3	154.6	79.3	59.3	87.7	67.6	
Level of Service	F	B	A	F	B	C	F	E	E	F	E	
Approach Delay (s)		27.3			20.5			113.1			81.8	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	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	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	5353	1667	1863	5353	1667	1770	1778	1667	1770	1863	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5353	1667	1863	5353	1667	1770	1778	1667	1770	1863	1667
Volume (vph)	28	755	680	98	1836	31	661	17	91	8	44	18
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	821	739	107	1996	34	718	18	99	9	48	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	20	0	0	0
Lane Group Flow (vph)	30	821	739	107	1996	34	359	377	79	9	48	20
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	8.0	100.1	190.0	17.2	109.3	190.0	44.8	44.8	44.8	8.6	8.6	190.0
Effective Green, g (s)	8.0	101.4	190.0	17.2	110.6	190.0	45.8	45.8	45.8	9.6	9.6	190.0
Actuated g/C Ratio	0.04	0.53	1.00	0.09	0.58	1.00	0.24	0.24	0.24	0.05	0.05	1.00
Clearance Time (s)	4.0	5.3		4.0	5.3		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	78	2857	1667	169	3116	1667	427	429	402	89	94	1667
v/s Ratio Prot	0.02	0.15		c0.06	c0.37		0.20	c0.21		0.01	0.03	
v/s Ratio Perm			c0.44			0.02			0.05			0.01
v/c Ratio	0.38	0.29	0.44	0.63	0.64	0.02	0.84	0.88	0.20	0.10	0.51	0.01
Uniform Delay, d1	88.6	24.4	0.0	83.4	26.5	0.0	68.6	69.4	57.5	86.1	87.9	0.0
Progression Factor	1.00	1.00	1.00	1.08	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.3	0.9	6.7	0.8	0.0	14.4	18.6	0.3	0.7	6.1	0.0
Delay (s)	92.9	24.7	0.9	96.3	22.3	0.0	83.0	88.0	57.8	86.8	94.0	0.0
Level of Service	F	C	A	F	C	A	F	F	E	F	F	A
Approach Delay (s)		14.9			25.6			82.3			68.8	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	30	821	739	107	1996	34	359	377	99	9	48	20
v/c Ratio	0.32	0.28	0.44	0.64	0.63	0.02	0.84	0.88	0.24	0.09	0.44	0.01
Control Delay	95.3	25.3	0.9	102.2	22.7	0.0	85.9	90.0	44.4	85.9	98.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.3	25.3	0.9	102.2	22.7	0.0	85.9	90.0	44.4	85.9	98.7	0.0
Queue Length 50th (ft)	37	232	0	141	420	0	426	452	69	11	62	0
Queue Length 95th (ft)	77	247	0	m191	m375	m0	#681	#727	137	34	115	0
Internal Link Dist (ft)		670			841			82			906	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	118	2911	1667	255	3236	1667	428	430	423	113	119	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.44	0.42	0.62	0.02	0.84	0.88	0.23	0.08	0.40	0.01

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1706	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1706	1583
Volume (vph)	0	1877	766	156	399	0	0	0	0	454	19	49
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	1915	782	162	416	0	0	0	0	499	21	54
RTOR Reduction (vph)	0	0	336	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	1915	446	162	416	0	0	0	0	259	261	11
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		45.1	45.1	12.9	62.5					16.4	16.4	16.4
Effective Green, g (s)		46.6	46.6	12.4	64.0					17.4	17.4	17.4
Actuated g/C Ratio		0.52	0.52	0.14	0.72					0.19	0.19	0.19
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2790	869	258	3832					344	332	308
v/s Ratio Prot		c0.36	0.27	c0.09	0.08					0.15	c0.15	0.01
v/s Ratio Perm												
v/c Ratio		0.69	0.51	0.63	0.11					0.75	0.79	0.03
Uniform Delay, d1		16.0	14.0	36.3	3.9					34.0	34.2	29.2
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		1.1	1.4	4.7	0.0					9.0	11.6	0.0
Delay (s)		17.0	15.4	41.0	3.9					43.0	45.8	29.2
Level of Service		B	B	D	A					D	D	C
Approach Delay (s)		16.6			14.3			0.0			43.0	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.99		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	0.98	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1863	5353	1630	1863	5262		1770	1831	1667	1770	1801	1657
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1863	5353	1630	1863	5262		1770	1831	1667	1770	1801	1657
Volume (vph)	99	1529	644	160	390	42	119	61	423	75	14	83
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	106	1644	692	186	453	49	143	73	510	90	17	100
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	87	0	0	86
Lane Group Flow (vph)	106	1644	692	186	497	0	105	111	423	52	55	14
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)			5			3						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	9.1	44.8	101.0	18.9	54.6		11.6	11.6	30.5	6.2	6.2	15.3
Effective Green, g (s)	8.6	46.3	101.0	18.4	56.1		12.6	12.6	32.0	5.7	5.7	14.3
Actuated g/C Ratio	0.09	0.46	1.00	0.18	0.56		0.12	0.12	0.32	0.06	0.06	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	159	2454	1630	339	2923		221	228	594	100	102	235
v/s Ratio Prot	0.06	c0.31		0.10	0.09		0.06	0.06	c0.14	0.03	0.03	0.01
v/s Ratio Perm			c0.42						0.12			0.00
v/c Ratio	0.67	0.67	0.42	0.55	0.17		0.48	0.49	0.71	0.52	0.54	0.06
Uniform Delay, d1	44.8	21.4	0.0	37.5	11.0		41.1	41.2	30.4	46.3	46.4	37.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.1	1.5	0.8	1.8	0.1		1.2	1.2	4.0	7.6	8.3	0.1
Delay (s)	54.9	22.9	0.8	39.3	11.1		42.3	42.4	34.4	53.9	54.6	37.6
Level of Service	D	C	A	D	B		D	D	C	D	D	D
Approach Delay (s)		18.0			18.7			36.8			46.2	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5209		1863	5353	1667	1863	3725	1652	1863	3725	1655
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5209		1863	5353	1667	1863	3725	1652	1863	3725	1655
Volume (vph)	418	1344	256	37	414	94	70	392	47	115	272	78
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	475	1527	291	41	460	104	74	417	50	126	299	86
RTOR Reduction (vph)	0	16	0	0	0	48	0	0	35	0	0	47
Lane Group Flow (vph)	475	1802	0	41	460	56	74	417	15	126	299	39
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	20.8	41.0		6.8	27.0	42.4	8.2	18.2	25.0	10.4	20.4	41.2
Effective Green, g (s)	21.8	42.0		7.8	28.0	42.4	8.2	20.2	28.0	10.4	22.4	44.2
Actuated g/C Ratio	0.23	0.44		0.08	0.29	0.44	0.09	0.21	0.29	0.11	0.23	0.46
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	817	2269		151	1555	733	158	781	548	201	866	828
v/s Ratio Prot	c0.13	c0.35		0.02	0.09	0.03	0.04	c0.11	0.00	c0.07	0.08	0.01
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.58	0.79		0.27	0.30	0.08	0.47	0.53	0.03	0.63	0.35	0.05
Uniform Delay, d1	33.2	23.5		41.6	26.5	15.7	42.0	33.9	24.5	41.1	30.9	14.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	2.4		1.3	0.3	0.1	3.0	0.9	0.0	6.8	0.7	0.0
Delay (s)	34.9	25.9		43.0	26.8	15.8	45.0	34.8	24.5	47.9	31.6	14.5
Level of Service	C	C		D	C	B	D	C	C	D	C	B
Approach Delay (s)		27.8			26.0			35.2			32.7	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	96.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	172	1351	9	35	423	195	6	189	38	223	116	103
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.94	0.94	0.94
Adj. Flow (vph)	193	1518	10	38	465	214	7	220	44	237	123	110
RTOR Reduction (vph)	0	0	0	0	0	76	0	0	26	0	0	62
Lane Group Flow (vph)	193	1528	0	38	465	138	7	220	18	237	123	48
Confl. Peds. (#/hr)	2		12	12		2	6		8	8		6
Confl. Bikes (#/hr)			3			1			1			1
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	18.9	73.4		6.9	61.4	89.1	1.8	17.7	29.6	22.7	37.1	61.0
Effective Green, g (s)	18.4	74.4		7.4	62.4	90.6	5.8	18.7	30.1	26.7	38.1	61.5
Actuated g/C Ratio	0.13	0.53		0.05	0.44	0.64	0.04	0.13	0.21	0.19	0.27	0.44
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	244	2827		98	2374	1073	77	495	357	354	1009	729
v/s Ratio Prot	c0.10	c0.29		0.02	0.09	0.08	0.00	c0.06	0.01	c0.13	0.03	0.03
v/s Ratio Perm												
v/c Ratio	0.79	0.54		0.39	0.20	0.13	0.09	0.44	0.05	0.67	0.12	0.07
Uniform Delay, d1	59.3	21.9		64.5	23.9	9.7	64.9	56.2	43.9	52.9	38.7	23.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.9	0.7		2.5	0.2	0.2	0.7	1.1	0.1	7.4	0.1	0.1
Delay (s)	75.2	22.6		67.0	24.0	9.9	65.6	57.3	44.0	60.3	38.8	23.0
Level of Service	E	C		E	C	A	E	E	D	E	D	C
Approach Delay (s)		28.5			22.1			55.4			45.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	140.7	Sum of lost time (s)	10.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	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	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1611	1863	5353	1644	1863	3539		3614	1961	1640
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1611	1863	5353	1644	1863	3539		3614	1961	1640
Volume (vph)	202	1293	62	5	487	126	31	44	22	257	48	168
Peak-hour factor, PHF	0.91	0.91	0.91	0.97	0.97	0.97	0.67	0.67	0.67	0.84	0.84	0.84
Adj. Flow (vph)	222	1421	68	5	502	130	46	66	33	306	57	200
RTOR Reduction (vph)	0	0	22	0	0	66	0	30	0	0	0	162
Lane Group Flow (vph)	222	1421	46	5	502	64	46	69	0	306	57	38
Confl. Peds. (#/hr)	1		4	4		1	4					4
Confl. Bikes (#/hr)			6			1						1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.5	61.4	61.4	1.0	50.9	50.9	4.8	11.7		13.5	20.9	20.9
Effective Green, g (s)	11.5	62.4	62.4	1.0	51.9	51.9	4.3	11.2		14.5	20.4	20.4
Actuated g/C Ratio	0.11	0.59	0.59	0.01	0.49	0.49	0.04	0.11		0.14	0.19	0.19
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	392	3148	947	18	2618	804	76	374		494	377	315
v/s Ratio Prot	c0.06	c0.27		0.00	0.09		0.02	c0.02		c0.08	0.03	
v/s Ratio Perm			0.03			0.04						0.02
v/c Ratio	0.57	0.45	0.05	0.28	0.19	0.08	0.61	0.19		0.62	0.15	0.12
Uniform Delay, d1	44.9	12.3	9.3	52.2	15.3	14.4	50.1	43.3		43.2	35.6	35.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5	0.1	8.3	0.2	0.2	12.9	0.2		2.3	0.2	0.2
Delay (s)	46.8	12.7	9.4	60.4	15.4	14.6	62.9	43.5		45.5	35.8	35.6
Level of Service	D	B	A	E	B	B	E	D		D	D	D
Approach Delay (s)		17.0			15.6			49.7			41.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	106.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	222	1421	68	5	502	130	46	99	306	57	200
v/c Ratio	0.54	0.43	0.07	0.05	0.20	0.15	0.35	0.23	0.59	0.14	0.41
Control Delay	50.3	15.1	7.2	59.0	19.8	5.4	59.7	28.9	48.0	34.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	15.1	7.2	59.0	19.8	5.4	59.7	28.9	48.0	34.2	7.1
Queue Length 50th (ft)	65	138	3	3	60	0	27	20	89	31	0
Queue Length 95th (ft)	147	460	41	20	165	48	64	31	178	63	40
Internal Link Dist (ft)		928			806			508		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	812	3306	1008	243	2553	851	169	1262	728	840	816
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.43	0.07	0.02	0.20	0.15	0.27	0.08	0.42	0.07	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	5345		1863	5353	1632	1863	1703		3614	1961	1636
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5345		1863	5353	1632	1863	1703		3614	1961	1636
Volume (vph)	42	1515	12	15	556	234	10	2	10	317	9	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.55	0.55	0.55	0.75	0.75	0.75
Adj. Flow (vph)	45	1629	13	16	604	254	18	4	18	423	12	67
RTOR Reduction (vph)	0	1	0	0	0	156	0	16	0	0	0	47
Lane Group Flow (vph)	45	1641	0	16	604	98	18	6	0	423	12	20
Confl. Peds. (#/hr)			1	1			14		1	1		14
Confl. Bikes (#/hr)			8			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	2.2	24.8		0.6	23.2	23.2	0.7	6.4		12.2	18.4	18.4
Effective Green, g (s)	2.7	25.8		1.1	24.2	24.2	1.2	6.4		13.2	18.4	18.4
Actuated g/C Ratio	0.04	0.41		0.02	0.39	0.39	0.02	0.10		0.21	0.29	0.29
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	80	2206		33	2073	632	36	174		763	577	482
v/s Ratio Prot	c0.02	c0.31		0.01	0.11		0.01	0.00		c0.12	0.01	
v/s Ratio Perm						0.06						c0.01
v/c Ratio	0.56	0.74		0.48	0.29	0.16	0.50	0.03		0.55	0.02	0.04
Uniform Delay, d1	29.3	15.6		30.4	13.2	12.5	30.4	25.3		22.0	15.7	15.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.3	1.6		4.0	0.1	0.2	7.7	0.1		0.7	0.0	0.0
Delay (s)	34.6	17.1		34.5	13.4	12.7	38.1	25.3		22.7	15.7	15.8
Level of Service	C	B		C	B	B	D	C		C	B	B
Approach Delay (s)		17.6			13.6			31.1			21.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	62.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	5353	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	5353	1667	3614	1667
Volume (vph)	359	2295	11	1154	111	389	449
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	390	2495	12	1254	121	423	488
RTOR Reduction (vph)	0	0	0	0	17	0	0
Lane Group Flow (vph)	390	2495	12	1254	104	423	488
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	25.5	145.2	3.3	123.0	123.0	26.9	190.0
Effective Green, g (s)	25.5	146.5	3.3	124.3	124.3	28.2	190.0
Actuated g/C Ratio	0.13	0.77	0.02	0.65	0.65	0.15	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	485	5201	32	3502	1091	536	1667
v/s Ratio Prot	c0.11	c0.37	0.01	0.23		c0.12	
v/s Ratio Perm					0.06		0.29
v/c Ratio	0.80	0.48	0.38	0.36	0.10	0.79	0.29
Uniform Delay, d1	79.8	7.9	92.3	14.8	12.1	78.0	0.0
Progression Factor	1.23	0.62	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.2	7.2	0.3	0.2	7.6	0.4
Delay (s)	105.3	5.1	99.6	15.1	12.3	85.6	0.4
Level of Service	F	A	F	B	B	F	A
Approach Delay (s)		18.7		15.6		40.0	
Approach LOS		B		B		D	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.8%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Volume (vph)	183	1870	244	210	798	344	101	339	177	585	1062	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	2033	265	228	867	374	110	368	192	636	1154	60
RTOR Reduction (vph)	0	0	0	0	0	196	0	0	125	0	4	0
Lane Group Flow (vph)	199	2033	265	228	867	178	110	368	67	636	1210	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	15.8	88.9	190.0	16.0	89.1	89.1	11.1	27.8	27.8	35.0	52.7	
Effective Green, g (s)	17.3	90.2	190.0	17.5	90.4	90.4	12.6	28.8	28.8	37.5	53.7	
Actuated g/C Ratio	0.09	0.47	1.00	0.09	0.48	0.48	0.07	0.15	0.15	0.20	0.28	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	6.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	329	3202	1667	333	3209	793	240	565	253	713	1502	
v/s Ratio Prot	0.06	c0.30		c0.06	0.13		0.03	0.10		c0.18	c0.23	
v/s Ratio Perm			c0.16			0.11			0.04			
v/c Ratio	0.60	0.63	0.16	0.68	0.27	0.22	0.46	0.65	0.27	0.89	0.81	
Uniform Delay, d1	83.1	37.5	0.0	83.6	30.0	29.2	85.4	75.9	71.3	74.3	63.3	
Progression Factor	1.43	0.25	1.00	0.96	0.99	1.20	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.5	0.1	5.5	0.2	0.6	1.4	3.0	0.8	13.5	3.4	
Delay (s)	120.4	9.8	0.1	85.8	29.9	35.8	86.8	78.9	72.0	87.7	66.8	
Level of Service	F	A	A	F	C	D	F	E	E	F	E	
Approach Delay (s)		17.6			40.0			78.2			74.0	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	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	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	5353	1667	1863	5353	1667	1770	1789	1667	1770	1863	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5353	1667	1863	5353	1667	1770	1789	1667	1770	1863	1667
Volume (vph)	37	2066	1180	151	870	21	712	71	125	13	109	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	2246	1283	164	946	23	774	77	136	14	118	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	40	2246	1283	164	946	23	414	437	115	14	118	59
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	9.0	88.6	190.0	20.0	99.6	190.0	49.4	49.4	49.4	12.0	12.0	190.0
Effective Green, g (s)	10.0	89.6	190.0	21.0	100.6	190.0	50.4	50.4	50.4	13.0	13.0	190.0
Actuated g/C Ratio	0.05	0.47	1.00	0.11	0.53	1.00	0.27	0.27	0.27	0.07	0.07	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	98	2524	1667	206	2834	1667	470	475	442	121	127	1667
v/s Ratio Prot	0.02	c0.42		0.09	0.18		0.23	c0.24		0.01	0.06	
v/s Ratio Perm			c0.77			0.01			0.07			0.04
v/c Ratio	0.41	0.89	0.77	0.80	0.33	0.01	0.88	0.92	0.26	0.12	0.93	0.04
Uniform Delay, d1	87.1	45.7	0.0	82.4	25.5	0.0	66.9	67.8	55.1	83.1	88.0	0.0
Progression Factor	1.00	1.00	1.00	0.77	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	5.2	3.5	19.3	0.3	0.0	17.7	23.4	0.4	0.6	58.3	0.0
Delay (s)	90.9	50.9	3.5	82.8	29.5	0.0	84.6	91.3	55.5	83.7	146.4	0.0
Level of Service	F	D	A	F	C	A	F	F	E	F	F	A
Approach Delay (s)		34.3			36.6			83.6			96.6	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	40	2246	1283	164	946	23	414	437	136	14	118	59
v/c Ratio	0.35	0.89	0.77	0.80	0.33	0.01	0.88	0.92	0.29	0.12	0.93	0.04
Control Delay	93.4	50.6	3.5	89.3	28.7	0.0	85.9	91.1	48.0	85.5	147.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	50.6	3.5	89.3	28.7	0.0	85.9	91.1	48.0	85.5	147.2	0.0
Queue Length 50th (ft)	49	949	0	214	243	0	524	561	106	17	157	0
Queue Length 95th (ft)	94	848	0	m#316	386	m0	#914	#975	196	47	#305	0
Internal Link Dist (ft)		690			684			107			258	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	157	2902	1667	216	3077	1667	469	474	463	121	127	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.77	0.77	0.76	0.31	0.01	0.88	0.92	0.29	0.12	0.93	0.04

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Appendix D – Level of Service Worksheets: Background Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1500	1583
Volume (vph)	0	396	303	380	3441	0	0	0	0	159	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	440	337	409	3700	0	0	0	0	179	4	606
RTOR Reduction (vph)	0	0	186	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	440	151	409	3700	0	0	0	0	179	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		57.8	57.8	32.3	94.6					27.5	27.5	27.5
Effective Green, g (s)		59.3	59.3	31.8	96.1					28.5	28.5	28.5
Actuated g/C Ratio		0.45	0.45	0.24	0.72					0.21	0.21	0.21
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2394	745	447	3880					380	322	340
v/s Ratio Prot		0.08	0.09	0.22	c0.69					0.10	c0.20	0.19
v/s Ratio Perm												
v/c Ratio		0.18	0.20	0.91	0.95					0.47	0.95	0.89
Uniform Delay, d1		22.1	22.3	49.1	16.3					45.5	51.4	50.5
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.4	23.1	6.9					0.9	37.2	23.3
Delay (s)		22.2	22.7	72.2	23.2					46.4	88.5	73.8
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		22.4			28.1			0.0			73.3	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	132.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.99		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	0.96	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1863	5353	1632	1863	5292		1770	1791	1667	1770	1843	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (perm)	1863	5353	1632	1863	5292		1770	1791	1667	1770	1843	1667
Volume (vph)	95	317	86	184	2258	156	1539	174	125	90	60	225
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.96	0.96	0.96	0.70	0.70	0.70
Adj. Flow (vph)	114	382	104	200	2454	170	1603	181	130	129	86	321
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	36	0	0	2
Lane Group Flow (vph)	114	382	104	200	2620	0	869	915	94	105	110	319
Confl. Bikes (#/hr)			2			5						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	10.5	48.6	170.3	23.0	61.1		65.0	65.0	88.0	14.2	14.2	24.7
Effective Green, g (s)	10.0	50.1	170.3	22.5	62.6		66.0	66.0	89.5	13.7	13.7	23.7
Actuated g/C Ratio	0.06	0.29	1.00	0.13	0.37		0.39	0.39	0.53	0.08	0.08	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	109	1575	1632	246	1945		686	694	915	142	148	232
v/s Ratio Prot	0.06	0.07		0.11	c0.49		0.49	c0.51	0.01	0.06	0.06	c0.08
v/s Ratio Perm			0.06						0.04			0.11
v/c Ratio	1.05	0.24	0.06	0.81	1.35		1.27	1.32	0.10	0.74	0.74	1.38
Uniform Delay, d1	80.2	45.7	0.0	71.9	53.9		52.2	52.2	20.3	76.6	76.6	73.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.1	0.4	0.1	18.2	159.6		131.4	153.3	0.0	20.3	20.3	194.1
Delay (s)	179.2	46.0	0.1	90.1	213.4		183.6	205.5	20.3	96.9	96.8	267.4
Level of Service	F	D	A	F	F		F	F	C	F	F	F
Approach Delay (s)		63.4			204.7			183.0			199.0	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	182.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	170.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3614	5148		1863	5353	1667	1863	3725	1649	1863	3725	1652
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5148		1863	5353	1667	1863	3725	1649	1863	3725	1652
Volume (vph)	57	457	131	43	1760	71	337	268	82	135	369	489
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	72	578	166	47	1934	78	401	319	98	147	401	532
RTOR Reduction (vph)	0	31	0	0	0	22	0	0	63	0	0	12
Lane Group Flow (vph)	72	713	0	47	1934	56	401	319	35	147	401	520
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	10.1	46.7		8.8	45.4	65.4	26.2	32.7	41.5	15.0	21.5	31.6
Effective Green, g (s)	11.1	47.7		9.8	46.4	65.4	26.2	34.7	44.5	15.0	23.5	34.6
Actuated g/C Ratio	0.09	0.39		0.08	0.38	0.53	0.21	0.28	0.36	0.12	0.19	0.28
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	326	1993		148	2016	885	396	1049	649	227	711	518
v/s Ratio Prot	0.02	0.14		0.03	c0.36	0.03	c0.22	0.09	0.00	0.08	0.11	c0.09
v/s Ratio Perm									0.02			0.22
v/c Ratio	0.22	0.36		0.32	0.96	0.06	1.01	0.30	0.05	0.65	0.56	1.00
Uniform Delay, d1	52.0	26.9		53.5	37.5	14.0	48.5	34.8	25.6	51.6	45.2	44.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		1.7	12.2	0.1	48.4	0.2	0.0	6.9	2.1	40.4
Delay (s)	52.8	27.2		55.2	49.7	14.1	96.9	35.0	25.7	58.5	47.3	84.7
Level of Service	D	C		E	D	B	F	C	C	E	D	F
Approach Delay (s)		29.4			48.5			64.2			67.3	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	52.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5348		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5348		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	58	617	4	84	1891	127	11	129	34	134	210	107
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.73	0.73	0.73
Adj. Flow (vph)	64	686	4	91	2055	138	14	168	44	184	288	147
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	34	0	0	61
Lane Group Flow (vph)	64	690	0	91	2055	120	14	168	10	184	288	86
Confl. Peds. (#/hr)	6					6	8					8
Confl. Bikes (#/hr)						7			2			
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	10.3	80.5		12.4	82.6	109.5	3.7	15.9	33.3	21.9	32.6	47.9
Effective Green, g (s)	9.8	81.5		12.9	83.6	111.0	7.7	16.9	33.8	25.9	33.6	48.4
Actuated g/C Ratio	0.07	0.54		0.09	0.55	0.74	0.05	0.11	0.22	0.17	0.22	0.32
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	121	2892		159	2970	1228	95	418	374	320	831	535
v/s Ratio Prot	0.03	0.13		c0.05	c0.38	0.07	0.01	c0.05	0.01	c0.10	0.08	0.05
v/s Ratio Perm												
v/c Ratio	0.53	0.24		0.57	0.69	0.10	0.15	0.40	0.03	0.57	0.35	0.16
Uniform Delay, d1	68.2	18.2		66.2	24.2	5.6	68.4	62.2	45.6	57.3	49.3	36.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.2		4.9	1.3	0.1	1.0	1.1	0.0	4.9	0.5	0.3
Delay (s)	72.3	18.4		71.2	25.6	5.7	69.3	63.3	45.7	62.3	49.8	36.9
Level of Service	E	B		E	C	A	E	E	D	E	D	D
Approach Delay (s)		23.0			26.2			60.2			50.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.7	Sum of lost time (s)	9.5
Intersection Capacity Utilization	71.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	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	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1614	1863	5353	1633	1863	3629		3614	1961	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1614	1863	5353	1633	1863	3629		3614	1961	1642
Volume (vph)	62	706	41	9	2027	114	18	14	3	91	40	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.83	0.83	0.83
Adj. Flow (vph)	67	767	45	10	2156	121	20	16	3	110	48	90
RTOR Reduction (vph)	0	0	13	0	0	22	0	3	0	0	0	80
Lane Group Flow (vph)	67	767	32	10	2156	99	20	16	0	110	48	10
Confl. Peds. (#/hr)	5		4	4		5	3		2	2		3
Confl. Bikes (#/hr)			1			3						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	6.5	89.0	89.0	1.2	83.7	83.7	3.0	8.1		9.0	14.6	14.6
Effective Green, g (s)	6.5	90.0	90.0	1.2	84.7	84.7	2.5	7.6		10.0	14.1	14.1
Actuated g/C Ratio	0.05	0.72	0.72	0.01	0.67	0.67	0.02	0.06		0.08	0.11	0.11
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	187	3830	1155	18	3604	1099	37	219		287	220	184
v/s Ratio Prot	c0.02	0.14		0.01	c0.40		0.01	0.00		c0.03	c0.02	
v/s Ratio Perm			0.02			0.06						0.01
v/c Ratio	0.36	0.20	0.03	0.56	0.60	0.09	0.54	0.07		0.38	0.22	0.05
Uniform Delay, d1	57.6	5.9	5.2	62.0	11.2	7.1	61.1	55.8		55.0	50.8	49.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	0.0	32.3	0.7	0.2	15.1	0.1		0.9	0.5	0.1
Delay (s)	58.8	6.1	5.2	94.3	12.0	7.3	76.2	55.9		55.8	51.3	50.0
Level of Service	E	A	A	F	B	A	E	E		E	D	D
Approach Delay (s)		10.0			12.1			66.3			52.9	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	125.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	67	767	45	10	2156	121	20	19	110	48	90
v/c Ratio	0.29	0.19	0.04	0.11	0.59	0.11	0.21	0.06	0.36	0.21	0.33
Control Delay	59.2	8.0	4.2	65.7	15.3	6.6	65.4	41.9	57.1	47.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	8.0	4.2	65.7	15.4	6.6	65.4	41.9	57.1	47.5	11.9
Queue Length 50th (ft)	22	26	0	6	209	9	13	5	35	30	0
Queue Length 95th (ft)	61	198	23	32	761	68	48	17	83	65	36
Internal Link Dist (ft)		967			784			389		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	325	4025	1221	157	3666	1138	146	1014	336	582	550
Starvation Cap Reductn	0	0	0	0	322	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.19	0.04	0.06	0.64	0.11	0.14	0.02	0.33	0.08	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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
Frt	1.00	1.00		1.00	1.00	0.85	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		0.95	1.00	1.00
Satd. Flow (prot)	1863	5342		1863	5353	1629	1863	1667		3614	1961	1641
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5342		1863	5353	1629	1863	1667		3614	1961	1641
Volume (vph)	18	758	9	15	2100	135	9	0	14	77	4	28
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.67	0.67	0.67	0.65	0.65	0.65
Adj. Flow (vph)	20	852	10	17	2333	150	13	0	21	118	6	43
RTOR Reduction (vph)	0	0	0	0	0	28	0	19	0	0	0	37
Lane Group Flow (vph)	20	862	0	17	2333	122	13	2	0	118	6	6
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			1			4						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	2.1	52.2		2.0	52.1	52.1	0.9	7.3		6.0	12.9	12.9
Effective Green, g (s)	2.6	53.2		2.5	53.1	53.1	1.4	7.3		7.0	12.9	12.9
Actuated g/C Ratio	0.03	0.62		0.03	0.62	0.62	0.02	0.08		0.08	0.15	0.15
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	56	3305		54	3305	1006	30	142		294	294	246
v/s Ratio Prot	c0.01	0.16		0.01	c0.44		0.01	0.00		c0.03	0.00	
v/s Ratio Perm						0.07						c0.00
v/c Ratio	0.36	0.26		0.31	0.71	0.12	0.43	0.01		0.40	0.02	0.03
Uniform Delay, d1	40.9	7.5		40.9	11.2	6.8	41.9	36.0		37.5	31.2	31.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1		1.2	0.8	0.1	7.1	0.0		0.7	0.0	0.0
Delay (s)	42.3	7.5		42.1	12.0	6.9	49.0	36.1		38.2	31.2	31.2
Level of Service	D	A		D	B	A	D	D		D	C	C
Approach Delay (s)		8.3			11.9			41.0			36.1	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	404	915	11	3101	484	47	301
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	439	995	12	3371	526	51	327
RTOR Reduction (vph)	0	0	0	0	39	0	0
Lane Group Flow (vph)	439	995	12	3371	487	51	327
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	29.6	160.2	3.3	133.9	133.9	11.9	190.0
Effective Green, g (s)	29.6	161.5	3.3	135.2	135.2	13.2	190.0
Actuated g/C Ratio	0.16	0.85	0.02	0.71	0.71	0.07	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	563	5733	32	4800	1186	251	1667
v/s Ratio Prot	c0.12	0.15	0.01	c0.50		0.01	
v/s Ratio Perm					0.29		c0.20
v/c Ratio	0.78	0.17	0.38	0.70	0.41	0.20	0.20
Uniform Delay, d1	77.1	2.5	92.3	15.8	11.2	83.4	0.0
Progression Factor	1.04	2.03	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.1	7.2	0.9	1.1	0.4	0.3
Delay (s)	85.7	5.1	99.6	16.7	12.2	83.8	0.3
Level of Service	F	A	F	B	B	F	A
Approach Delay (s)		29.8		16.3		11.5	
Approach LOS		C		B		B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5276	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5276	
Volume (vph)	117	622	20	42	1685	1321	554	774	43	473	209	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	676	22	46	1832	1436	602	841	47	514	227	24
RTOR Reduction (vph)	0	0	0	0	0	140	0	0	35	0	7	0
Lane Group Flow (vph)	127	676	22	46	1832	1296	602	841	12	514	244	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	10.1	97.5	190.0	6.8	94.2	94.2	27.5	46.9	46.9	17.5	36.9	
Effective Green, g (s)	11.6	98.8	190.0	8.3	95.5	95.5	29.0	47.9	47.9	19.0	37.9	
Actuated g/C Ratio	0.06	0.52	1.00	0.04	0.50	0.50	0.15	0.25	0.25	0.10	0.20	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	221	3507	1667	158	3390	838	552	939	420	361	1052	
v/s Ratio Prot	c0.04	c0.10		0.01	0.27		c0.17	c0.23		c0.14	0.05	
v/s Ratio Perm			0.01			c0.78			0.01			
v/c Ratio	0.57	0.19	0.01	0.29	0.54	1.55	1.09	0.90	0.03	1.42	0.23	
Uniform Delay, d1	86.8	24.3	0.0	88.0	32.3	47.2	80.5	68.6	53.5	85.5	63.8	
Progression Factor	1.33	0.49	1.00	1.25	0.55	0.59	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.1	0.0	0.8	0.5	250.6	65.3	11.2	0.0	206.2	0.2	
Delay (s)	119.2	12.1	0.0	110.7	18.2	278.3	145.8	79.9	53.6	291.7	64.0	
Level of Service	F	B	A	F	B	F	F	E	D	F	E	
Approach Delay (s)		28.2			132.2			105.7			217.0	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	122.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	44	892	805	127	2062	33	740	41	109	8	57	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	970	875	138	2241	36	804	45	118	9	62	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	88	0	0	0
Lane Group Flow (vph)	48	970	875	138	2241	36	804	45	30	9	62	21
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	9.7	90.7	190.0	20.0	101.0	190.0	47.7	47.7	47.7	12.3	12.3	190.0
Effective Green, g (s)	9.7	92.0	190.0	20.0	102.3	190.0	48.7	48.7	48.7	13.3	13.3	190.0
Actuated g/C Ratio	0.05	0.48	1.00	0.11	0.54	1.00	0.26	0.26	0.26	0.07	0.07	1.00
Clearance Time (s)	4.0	5.3		4.0	5.3		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	95	3266	1667	196	3632	1667	926	503	427	253	137	1667
v/s Ratio Prot	0.03	0.14		c0.07	c0.33		c0.22	0.02		0.00	0.03	
v/s Ratio Perm			c0.53			0.02			0.02			0.01
v/c Ratio	0.51	0.30	0.52	0.70	0.62	0.02	0.87	0.09	0.07	0.04	0.45	0.01
Uniform Delay, d1	87.8	29.5	0.0	82.1	30.3	0.0	67.6	53.8	53.5	82.4	84.9	0.0
Progression Factor	1.00	1.00	1.00	0.90	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.2	1.2	8.7	0.6	0.0	8.9	0.1	0.1	0.1	3.2	0.0
Delay (s)	93.5	29.8	1.2	82.4	27.1	0.0	76.5	53.9	53.6	82.4	88.1	0.0
Level of Service	F	C	A	F	C	A	E	D	D	F	F	A
Approach Delay (s)		18.2			29.8			72.7			67.4	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	970	875	138	2241	36	804	45	118	9	62	21
v/c Ratio	0.43	0.30	0.52	0.70	0.61	0.02	0.87	0.09	0.23	0.04	0.45	0.01
Control Delay	97.4	31.7	1.2	87.3	28.6	0.0	77.9	51.8	8.1	80.5	94.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.4	31.7	1.2	87.3	28.6	0.0	77.9	51.8	8.1	80.5	94.5	0.0
Queue Length 50th (ft)	59	210	0	169	413	0	501	43	0	5	76	0
Queue Length 95th (ft)	108	291	0	m239	m512	m0	544	77	53	15	130	0
Internal Link Dist (ft)		670			841			82			906	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	167	3268	1667	284	3660	1667	1122	609	599	342	186	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.30	0.52	0.49	0.61	0.02	0.72	0.07	0.20	0.03	0.33	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1705	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1705	1583
Volume (vph)	0	2725	1469	343	740	0	0	0	0	546	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	2781	1499	357	771	0	0	0	0	600	21	74
RTOR Reduction (vph)	0	0	190	0	0	0	0	0	0	0	0	62
Lane Group Flow (vph)	0	2781	1309	357	771	0	0	0	0	309	312	12
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	986	286	4181					284	274	254
v/s Ratio Prot		0.52	c0.79	c0.19	0.14					0.17	c0.18	0.01
v/s Ratio Perm												
v/c Ratio		0.88	1.33	1.25	0.18					1.09	1.14	0.05
Uniform Delay, d1		23.8	28.0	58.0	3.8					57.5	57.5	48.6
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		3.5	154.3	137.4	0.1					78.9	97.1	0.1
Delay (s)		27.3	182.3	195.4	3.9					136.4	154.6	48.7
Level of Service		C	F	F	A					F	F	D
Approach Delay (s)		81.6			64.5			0.0			135.2	
Approach LOS		F			E			A			F	

Intersection Summary			
HCM Average Control Delay	84.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	130.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		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	0.97	1.00
Satd. Flow (prot)	1863	5353	1630	1863	5157		1770	1856	1667	1770	1814	1657
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1863	5353	1630	1863	5157		1770	1856	1667	1770	1814	1657
Volume (vph)	210	2177	696	169	596	159	206	187	519	203	63	266
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	226	2341	748	197	693	185	248	225	625	245	76	320
RTOR Reduction (vph)	0	0	0	0	23	0	0	0	9	0	0	129
Lane Group Flow (vph)	226	2341	748	197	855	0	231	242	616	156	165	191
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)			5			3						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	23.3	75.6	156.2	18.6	70.9		25.2	25.2	43.8	17.3	17.3	40.6
Effective Green, g (s)	22.8	77.1	156.2	18.1	72.4		26.2	26.2	45.3	16.8	16.8	39.6
Actuated g/C Ratio	0.15	0.49	1.00	0.12	0.46		0.17	0.17	0.29	0.11	0.11	0.25
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	272	2642	1630	216	2390		297	311	526	190	195	420
v/s Ratio Prot	0.12	c0.44		0.11	0.17		0.13	0.13	c0.14	0.09	c0.09	0.07
v/s Ratio Perm			c0.46						0.23			0.05
v/c Ratio	0.83	0.89	0.46	0.91	0.36		0.78	0.78	1.17	0.82	0.85	0.45
Uniform Delay, d1	64.8	35.6	0.0	68.3	26.9		62.2	62.2	55.4	68.2	68.4	49.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.0	4.8	0.9	37.8	0.3		11.6	11.2	96.2	25.8	28.9	0.8
Delay (s)	83.8	40.4	0.9	106.1	27.2		73.8	73.4	151.6	94.0	97.4	50.0
Level of Service	F	D	A	F	C		E	E	F	F	F	D
Approach Delay (s)		34.5			41.7			118.0			72.9	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	156.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.4%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5215		1863	5353	1667	1863	3725	1652	1863	3725	1656
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5215		1863	5353	1667	1863	3725	1652	1863	3725	1656
Volume (vph)	560	1911	344	74	771	195	118	437	64	195	335	135
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	636	2172	391	82	857	217	126	465	68	214	368	148
RTOR Reduction (vph)	0	15	0	0	0	61	0	0	8	0	0	29
Lane Group Flow (vph)	636	2548	0	82	857	156	126	465	60	214	368	119
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	27.6	57.6		9.5	39.5	58.6	12.3	21.2	30.7	14.1	23.0	50.6
Effective Green, g (s)	28.6	58.6		10.5	40.5	58.6	12.3	23.2	33.7	14.1	25.0	53.6
Actuated g/C Ratio	0.23	0.48		0.09	0.33	0.48	0.10	0.19	0.28	0.12	0.20	0.44
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	844	2497		160	1771	798	187	706	509	215	761	779
v/s Ratio Prot	c0.18	c0.49		0.04	0.16	0.09	0.07	c0.12	0.01	c0.11	0.10	0.04
v/s Ratio Perm									0.03			0.04
v/c Ratio	0.75	1.02		0.51	0.48	0.20	0.67	0.66	0.12	1.00	0.48	0.15
Uniform Delay, d1	43.6	31.9		53.5	32.6	18.3	53.1	45.9	33.2	54.1	43.0	20.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	23.3		3.7	0.6	0.3	10.0	2.5	0.1	59.8	1.4	0.2
Delay (s)	48.2	55.2		57.2	33.2	18.7	63.1	48.4	33.4	113.9	44.4	20.9
Level of Service	D	E		E	C	B	E	D	C	F	D	C
Approach Delay (s)		53.8			32.2			49.7			60.0	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	49.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	213	2095	12	47	908	244	6	228	38	243	140	119
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.94	0.94	0.94
Adj. Flow (vph)	239	2354	13	52	998	268	7	265	44	259	149	127
RTOR Reduction (vph)	0	0	0	0	0	51	0	0	20	0	0	70
Lane Group Flow (vph)	239	2367	0	52	998	217	7	265	24	259	149	57
Confl. Peds. (#/hr)	2		12	12		2	6		8	8		6
Confl. Bikes (#/hr)			3			1			1			1
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	25.1	91.0		7.5	73.4	106.4	1.9	20.1	32.6	28.0	44.7	74.8
Effective Green, g (s)	24.6	92.0		8.0	74.4	107.9	5.9	21.1	33.1	32.0	45.7	75.3
Actuated g/C Ratio	0.15	0.55		0.05	0.45	0.65	0.04	0.13	0.20	0.19	0.27	0.45
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	275	2953		89	2391	1080	66	472	331	358	1022	753
v/s Ratio Prot	c0.13	c0.44		0.03	0.19	0.13	0.00	c0.07	0.01	c0.14	0.04	0.03
v/s Ratio Perm												
v/c Ratio	0.87	0.80		0.58	0.42	0.20	0.11	0.56	0.07	0.72	0.15	0.08
Uniform Delay, d1	69.4	30.0		77.7	31.4	11.9	77.8	68.4	54.3	63.1	45.7	25.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.0	2.4		9.4	0.5	0.3	1.0	2.2	0.2	9.8	0.1	0.1
Delay (s)	93.4	32.4		87.1	31.9	12.1	78.8	70.6	54.4	73.0	45.8	26.0
Level of Service	F	C		F	C	B	E	E	D	E	D	C
Approach Delay (s)		38.0			30.1			68.5			54.3	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	166.6	Sum of lost time (s)	10.5
Intersection Capacity Utilization	77.9%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	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	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1609	1863	5353	1644	1863	3541		3614	1961	1639
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1609	1863	5353	1644	1863	3541		3614	1961	1639
Volume (vph)	209	2001	77	12	996	126	31	45	22	270	50	174
Peak-hour factor, PHF	0.91	0.91	0.91	0.97	0.97	0.97	0.67	0.67	0.67	0.84	0.84	0.84
Adj. Flow (vph)	230	2199	85	12	1027	130	46	67	33	321	60	207
RTOR Reduction (vph)	0	0	19	0	0	60	0	29	0	0	0	172
Lane Group Flow (vph)	230	2199	66	12	1027	70	46	71	0	321	60	35
Confl. Peds. (#/hr)	1		4	4		1	4					4
Confl. Bikes (#/hr)			6			1						1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	12.6	77.1	77.1	2.7	67.2	67.2	6.9	14.1		14.5	22.2	22.2
Effective Green, g (s)	12.6	78.1	78.1	2.7	68.2	68.2	6.4	13.6		15.5	21.7	21.7
Actuated g/C Ratio	0.10	0.62	0.62	0.02	0.54	0.54	0.05	0.11		0.12	0.17	0.17
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	359	3294	990	40	2877	884	94	379		441	335	280
v/s Ratio Prot	c0.06	c0.41		0.01	0.19		0.02	0.02		c0.09	c0.03	
v/s Ratio Perm			0.04			0.04						0.02
v/c Ratio	0.64	0.67	0.07	0.30	0.36	0.08	0.49	0.19		0.73	0.18	0.13
Uniform Delay, d1	55.0	15.9	9.8	61.2	16.8	14.2	58.7	51.6		53.7	45.0	44.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	1.1	0.1	4.2	0.3	0.2	4.0	0.2		5.9	0.3	0.2
Delay (s)	58.8	17.0	9.9	65.4	17.1	14.4	62.6	51.8		59.6	45.2	44.8
Level of Service	E	B	A	E	B	B	E	D		E	D	D
Approach Delay (s)		20.6			17.3			55.2			52.9	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	126.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	230	2199	85	12	1027	130	46	100	321	60	207
v/c Ratio	0.62	0.65	0.08	0.13	0.36	0.14	0.40	0.26	0.71	0.17	0.45
Control Delay	63.0	19.0	7.6	66.2	19.4	4.1	70.2	34.6	62.6	45.4	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	19.0	7.6	66.2	19.4	4.1	70.2	34.6	62.6	45.4	8.6
Queue Length 50th (ft)	86	286	8	9	151	0	34	25	120	42	0
Queue Length 95th (ft)	165	813	53	35	322	43	67	35	#223	77	46
Internal Link Dist (ft)		928			806			508		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	461	3384	1031	154	2841	933	147	1031	473	639	673
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.65	0.08	0.08	0.36	0.14	0.31	0.10	0.68	0.09	0.31

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Volume (vph)	75	2191	24	25	1072	264	10	2	10	317	9	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.55	0.55	0.55	0.75	0.75	0.75
Adj. Flow (vph)	81	2356	26	27	1165	287	18	4	18	423	12	67
RTOR Reduction (vph)	0	0	0	0	0	136	0	17	0	0	0	53
Lane Group Flow (vph)	81	2382	0	27	1165	151	18	5	0	423	12	14
Confl. Peds. (#/hr)			1	1			14		1	1		14
Confl. Bikes (#/hr)			8			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.5	48.4		2.4	44.3	44.3	2.3	7.1		12.8	18.1	18.1
Effective Green, g (s)	7.0	49.4		2.9	45.3	45.3	2.8	7.1		13.8	18.1	18.1
Actuated g/C Ratio	0.08	0.55		0.03	0.51	0.51	0.03	0.08		0.15	0.20	0.20
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	146	2959		61	2719	829	58	135		559	398	331
v/s Ratio Prot	c0.04	c0.45		0.01	0.22		0.01	0.00		c0.12	0.01	
v/s Ratio Perm						0.09						c0.01
v/c Ratio	0.55	0.80		0.44	0.43	0.18	0.31	0.04		0.76	0.03	0.04
Uniform Delay, d1	39.6	16.0		42.4	13.8	11.9	42.3	37.9		36.1	28.5	28.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	1.9		1.9	0.2	0.2	2.2	0.1		5.5	0.0	0.0
Delay (s)	42.2	17.9		44.2	14.0	12.1	44.5	38.0		41.6	28.5	28.6
Level of Service	D	B		D	B	B	D	D		D	C	C
Approach Delay (s)		18.7			14.2			40.9			39.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	453	2957	58	1491	137	419	542
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	492	3214	63	1621	149	455	589
RTOR Reduction (vph)	0	0	0	0	21	0	0
Lane Group Flow (vph)	492	3214	63	1621	128	455	589
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	31.2	135.4	11.8	116.0	116.0	28.2	190.0
Effective Green, g (s)	31.2	136.7	11.8	117.3	117.3	29.5	190.0
Actuated g/C Ratio	0.16	0.72	0.06	0.62	0.62	0.16	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	593	4853	116	4164	1029	561	1667
v/s Ratio Prot	c0.14	c0.48	0.03	0.24		c0.13	
v/s Ratio Perm					0.08		0.35
v/c Ratio	0.83	0.66	0.54	0.39	0.12	0.81	0.35
Uniform Delay, d1	76.8	14.3	86.5	18.3	15.1	77.6	0.0
Progression Factor	1.11	0.69	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	5.1	0.3	0.2	8.7	0.6
Delay (s)	86.4	10.0	91.6	18.6	15.3	86.3	0.6
Level of Service	F	A	F	B	B	F	A
Approach Delay (s)		20.1		20.8		37.9	
Approach LOS		C		C		D	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.7%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5318	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5318	
Volume (vph)	207	2076	306	262	932	643	119	512	214	1077	1296	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	2257	333	285	1013	699	129	557	233	1171	1409	65
RTOR Reduction (vph)	0	0	0	0	0	307	0	0	93	0	3	0
Lane Group Flow (vph)	225	2257	333	285	1013	392	129	557	140	1171	1471	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	16.1	60.9	190.0	22.8	67.6	67.6	9.4	35.5	35.5	48.5	75.6	
Effective Green, g (s)	17.6	62.2	190.0	24.3	68.9	68.9	10.9	36.5	36.5	51.0	76.6	
Actuated g/C Ratio	0.09	0.33	1.00	0.13	0.36	0.36	0.06	0.19	0.19	0.27	0.40	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	6.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	335	2208	1667	462	2446	605	207	716	320	970	2144	
v/s Ratio Prot	c0.06	c0.33		c0.08	0.15		0.04	c0.15		c0.32	0.28	
v/s Ratio Perm			0.20			0.24			0.08			
v/c Ratio	0.67	1.02	0.20	0.62	0.41	0.65	0.62	0.78	0.44	1.21	0.69	
Uniform Delay, d1	83.4	63.9	0.0	78.4	45.4	50.5	87.5	72.9	67.7	69.5	46.8	
Progression Factor	1.40	0.36	1.00	1.10	1.13	1.94	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	20.8	0.2	2.3	0.5	5.0	5.7	5.7	1.3	103.0	1.0	
Delay (s)	120.0	44.0	0.2	88.4	52.0	102.8	93.3	78.6	69.0	172.5	47.8	
Level of Service	F	D	A	F	D	F	F	E	E	F	D	
Approach Delay (s)		44.9			75.0			78.2			103.0	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM Average Control Delay	74.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	39	2304	1296	173	1009	24	834	103	149	18	131	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	2504	1409	188	1097	26	907	112	162	20	142	68
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	111	0	0	0
Lane Group Flow (vph)	42	2504	1409	188	1097	26	907	112	51	20	142	68
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	6.6	81.0	190.0	21.9	96.3	190.0	50.5	50.5	50.5	16.6	16.6	190.0
Effective Green, g (s)	7.6	82.0	190.0	22.9	97.3	190.0	51.5	51.5	51.5	17.6	17.6	190.0
Actuated g/C Ratio	0.04	0.43	1.00	0.12	0.51	1.00	0.27	0.27	0.27	0.09	0.09	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	75	2911	1667	225	3454	1667	980	532	452	335	182	1667
v/s Ratio Prot	0.02	0.37		0.10	0.16		c0.25	0.06		0.01	0.07	
v/s Ratio Perm			c0.85			0.02			0.03			0.04
v/c Ratio	0.56	0.86	0.85	0.84	0.32	0.02	0.93	0.21	0.11	0.06	0.78	0.04
Uniform Delay, d1	89.6	48.8	0.0	81.7	27.0	0.0	67.4	53.5	52.1	78.7	84.3	0.0
Progression Factor	1.00	1.00	1.00	0.69	2.21	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	3.6	5.5	22.1	0.2	0.0	14.2	0.3	0.2	0.1	20.2	0.0
Delay (s)	100.7	52.4	5.5	78.7	60.0	0.0	81.6	53.8	52.2	78.8	104.5	0.0
Level of Service	F	D	A	E	E	A	F	D	D	E	F	A
Approach Delay (s)		36.2			61.5			74.9			71.4	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM Average Control Delay	49.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	2504	1409	188	1097	26	907	112	162	20	142	68
v/c Ratio	0.47	0.86	0.85	0.84	0.31	0.02	0.93	0.21	0.29	0.06	0.78	0.04
Control Delay	104.9	53.3	5.5	84.5	60.5	0.0	82.6	54.3	9.6	78.8	111.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.9	53.3	5.5	84.5	60.5	0.0	82.6	54.3	9.6	78.8	111.3	0.0
Queue Length 50th (ft)	52	844	0	244	396	0	568	108	9	11	176	0
Queue Length 95th (ft)	100	883	0	#365	435	m0	#661	168	73	28	#287	0
Internal Link Dist (ft)		690			684			107			258	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	90	2911	1667	235	3495	1667	1008	547	575	345	188	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.86	0.85	0.80	0.31	0.02	0.90	0.20	0.28	0.06	0.76	0.04

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Appendix E – Level of Service Worksheets: Background plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1500	1583
Volume (vph)	0	400	303	507	3451	0	0	0	0	187	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	444	337	545	3711	0	0	0	0	210	4	606
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	444	129	545	3711	0	0	0	0	210	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		49.3	49.3	41.1	94.9					27.6	27.6	27.6
Effective Green, g (s)		50.8	50.8	40.6	96.4					28.6	28.6	28.6
Actuated g/C Ratio		0.38	0.38	0.31	0.72					0.22	0.22	0.22
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2045	637	569	3880					381	323	340
v/s Ratio Prot		0.08	0.08	0.29	c0.69					0.12	c0.20	0.19
v/s Ratio Perm												
v/c Ratio		0.22	0.20	0.96	0.96					0.55	0.95	0.89
Uniform Delay, d1		27.7	27.5	45.4	16.4					46.5	51.5	50.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.4	27.2	7.2					1.7	36.1	23.3
Delay (s)		27.8	28.0	72.5	23.6					48.2	87.6	74.0
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		27.9			29.9			0.0			72.5	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	0.88	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	2933	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	2933	1863	5353					1770	1500	1583
Volume (vph)	0	400	303	507	3451	0	0	0	0	187	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	444	337	545	3711	0	0	0	0	210	4	606
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	444	129	545	3711	0	0	0	0	210	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		49.3	49.3	41.1	94.9					27.6	27.6	27.6
Effective Green, g (s)		50.8	50.8	40.6	96.4					28.6	28.6	28.6
Actuated g/C Ratio		0.38	0.38	0.31	0.72					0.22	0.22	0.22
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2045	1120	569	3880					381	323	340
v/s Ratio Prot		0.08	0.04	0.29	c0.69					0.12	c0.20	0.19
v/s Ratio Perm												
v/c Ratio		0.22	0.11	0.96	0.96					0.55	0.95	0.89
Uniform Delay, d1		27.7	26.6	45.4	16.4					46.5	51.5	50.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	27.2	7.2					1.7	36.1	23.3
Delay (s)		27.8	26.7	72.5	23.6					48.2	87.6	74.0
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		27.4			29.9			0.0			72.5	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	35.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.99		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	0.96	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1863	5353	1632	1863	5296		1770	1791	1667	1770	1843	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (perm)	1863	5353	1632	1863	5296		1770	1791	1667	1770	1843	1667
Volume (vph)	95	349	86	184	2394	156	1539	174	154	90	60	225
Peak-hour factor, PHF	0.83	0.83	0.83	0.96	0.96	0.96	0.96	0.96	0.96	0.70	0.70	0.70
Adj. Flow (vph)	114	420	104	192	2494	162	1603	181	160	129	86	321
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	44	0	0	2
Lane Group Flow (vph)	114	420	104	192	2652	0	869	915	116	105	110	319
Confl. Bikes (#/hr)			2			5						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	10.5	49.1	170.2	22.4	61.0		65.0	65.0	87.4	14.2	14.2	24.7
Effective Green, g (s)	10.0	50.6	170.2	21.9	62.5		66.0	66.0	88.9	13.7	13.7	23.7
Actuated g/C Ratio	0.06	0.30	1.00	0.13	0.37		0.39	0.39	0.52	0.08	0.08	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	109	1591	1632	240	1945		686	695	910	142	148	232
v/s Ratio Prot	0.06	0.08		0.10	c0.50		0.49	c0.51	0.02	0.06	0.06	c0.08
v/s Ratio Perm			0.06						0.05			0.11
v/c Ratio	1.05	0.26	0.06	0.80	1.36		1.27	1.32	0.13	0.74	0.74	1.38
Uniform Delay, d1	80.1	45.6	0.0	72.0	53.8		52.1	52.1	20.8	76.5	76.5	73.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.1	0.4	0.1	17.1	167.0		131.4	152.5	0.1	20.3	20.3	194.1
Delay (s)	179.2	46.0	0.1	89.2	220.9		183.5	204.6	20.9	96.8	96.8	267.3
Level of Service	F	D	A	F	F		F	F	C	F	F	F
Approach Delay (s)		62.3			212.0			180.1			198.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	184.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	170.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3614	5168		1863	5353	1667	1863	3725	1649	1863	3725	1652
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5168		1863	5353	1667	1863	3725	1649	1863	3725	1652
Volume (vph)	57	518	131	43	1896	90	337	268	82	143	369	489
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	72	656	166	47	2084	99	401	319	98	155	401	532
RTOR Reduction (vph)	0	26	0	0	0	25	0	0	63	0	0	12
Lane Group Flow (vph)	72	796	0	47	2084	74	401	319	35	155	401	520
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	10.1	46.7		8.8	45.4	65.8	26.2	32.3	41.1	15.4	21.5	31.6
Effective Green, g (s)	11.1	47.7		9.8	46.4	65.8	26.2	34.3	44.1	15.4	23.5	34.6
Actuated g/C Ratio	0.09	0.39		0.08	0.38	0.53	0.21	0.28	0.36	0.12	0.19	0.28
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	326	2001		148	2016	890	396	1037	644	233	711	518
v/s Ratio Prot	0.02	0.15		0.03	c0.39	0.04	c0.22	0.09	0.00	0.08	0.11	c0.09
v/s Ratio Perm									0.02			0.22
v/c Ratio	0.22	0.40		0.32	1.03	0.08	1.01	0.31	0.05	0.67	0.56	1.00
Uniform Delay, d1	52.0	27.3		53.5	38.4	14.0	48.5	35.1	25.9	51.4	45.2	44.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.4		1.7	29.3	0.1	48.4	0.2	0.0	7.7	2.1	40.4
Delay (s)	52.8	27.7		55.2	67.7	14.1	96.9	35.3	25.9	59.1	47.3	84.7
Level of Service	D	C		E	E	B	F	D	C	E	D	F
Approach Delay (s)		29.7			65.1			64.4			67.3	
Approach LOS		C			E			E			E	

Intersection Summary			
HCM Average Control Delay	59.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.4%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5353	1630	1863	5353	1667	1863	3725	1649	1863	3725	2908
Flt Permitted	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 (perm)	3614	5353	1630	1863	5353	1667	1863	3725	1649	1863	3725	2908
Volume (vph)	57	518	131	43	1896	90	337	268	82	143	369	489
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	72	656	166	47	2084	99	401	319	98	155	401	532
RTOR Reduction (vph)	0	0	75	0	0	25	0	0	63	0	0	22
Lane Group Flow (vph)	72	656	91	47	2084	74	401	319	35	155	401	510
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	9.6	46.3	46.3	8.8	45.5	65.9	26.3	32.4	41.2	15.4	21.5	31.1
Effective Green, g (s)	10.6	47.3	47.3	9.8	46.5	65.9	26.3	34.4	44.2	15.4	23.5	34.1
Actuated g/C Ratio	0.09	0.38	0.38	0.08	0.38	0.54	0.21	0.28	0.36	0.13	0.19	0.28
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0	6.0	4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	312	2060	627	149	2025	894	399	1043	647	233	712	902
v/s Ratio Prot	0.02	0.12		0.03	c0.39	0.04	c0.22	0.09	0.00	0.08	0.11	c0.05
v/s Ratio Perm			0.06						0.02			0.13
v/c Ratio	0.23	0.32	0.15	0.32	1.03	0.08	1.01	0.31	0.05	0.67	0.56	0.57
Uniform Delay, d1	52.3	26.5	24.6	53.4	38.2	13.8	48.3	34.8	25.7	51.3	45.0	38.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.3	0.3	1.7	27.9	0.1	46.3	0.2	0.0	7.7	2.1	1.3
Delay (s)	53.1	26.8	24.9	55.0	66.1	13.9	94.6	35.1	25.7	58.9	47.2	39.4
Level of Service	D	C	C	E	E	B	F	D	C	E	D	D
Approach Delay (s)		28.5			63.5			63.1			45.0	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM Average Control Delay	53.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	122.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.9%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5349		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5349		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	58	685	4	84	2046	137	11	129	34	138	210	107
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.73	0.73	0.73
Adj. Flow (vph)	64	761	4	91	2224	149	14	168	44	189	288	147
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	34	0	0	61
Lane Group Flow (vph)	64	765	0	91	2224	131	14	168	10	189	288	86
Confl. Peds. (#/hr)	6					6	8					8
Confl. Bikes (#/hr)						7			2			
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	10.3	80.5		12.4	82.6	109.8	3.7	15.9	33.3	22.2	32.9	48.2
Effective Green, g (s)	9.8	81.5		12.9	83.6	111.3	7.7	16.9	33.8	26.2	33.9	48.7
Actuated g/C Ratio	0.06	0.54		0.09	0.55	0.74	0.05	0.11	0.22	0.17	0.22	0.32
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	121	2887		159	2964	1229	95	417	373	323	836	538
v/s Ratio Prot	0.03	0.14		c0.05	c0.42	0.08	0.01	c0.05	0.01	c0.10	0.08	0.05
v/s Ratio Perm												
v/c Ratio	0.53	0.26		0.57	0.75	0.11	0.15	0.40	0.03	0.59	0.34	0.16
Uniform Delay, d1	68.4	18.7		66.4	25.7	5.7	68.5	62.4	45.8	57.4	49.2	36.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.2		4.9	1.8	0.1	1.0	1.1	0.0	5.1	0.5	0.3
Delay (s)	72.5	18.9		71.3	27.5	5.8	69.5	63.5	45.8	62.5	49.7	36.8
Level of Service	E	B		E	C	A	E	E	D	E	D	D
Approach Delay (s)		23.0			27.8			60.4			50.6	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	32.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	5.0	5.0	4.0	4.0	5.0
Lane Util. Factor	0.97	0.91	1.00		1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	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
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	5353	1614		1863	5353	1633	1863	1961	1644	3614	1961
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	5353	1614		1863	5353	1633	1863	1961	1644	3614	1961
Volume (vph)	62	713	105	22	48	2027	114	183	14	105	91	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.83	0.83
Adj. Flow (vph)	67	775	114	24	51	2156	121	208	16	119	110	48
RTOR Reduction (vph)	0	0	48	0	0	0	27	0	0	101	0	0
Lane Group Flow (vph)	67	775	66	0	75	2156	94	208	16	18	110	48
Confl. Peds. (#/hr)	5		4		4		5	3		2	2	
Confl. Bikes (#/hr)			1				3					
Turn Type	Prot		Perm	Prot	Prot		Perm	Prot		Perm	Prot	
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2				6			8		
Actuated Green, G (s)	6.3	71.0	71.0		8.3	73.0	73.0	15.9	18.0	18.0	9.1	11.7
Effective Green, g (s)	6.3	72.0	72.0		8.3	74.0	74.0	15.4	17.5	18.5	10.1	11.2
Actuated g/C Ratio	0.05	0.58	0.58		0.07	0.59	0.59	0.12	0.14	0.15	0.08	0.09
Clearance Time (s)	4.0	5.0	5.0		4.0	5.0	5.0	4.5	4.5	4.5	5.0	4.5
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	3086	930		124	3172	968	230	275	244	292	176
v/s Ratio Prot	0.02	0.14			c0.04	c0.40		c0.11	0.01		0.03	c0.02
v/s Ratio Perm			0.04				0.06			0.01		
v/c Ratio	0.37	0.25	0.07		0.60	0.68	0.10	0.90	0.06	0.07	0.38	0.27
Uniform Delay, d1	57.4	13.1	11.7		56.7	17.4	11.0	54.0	46.6	45.8	54.4	53.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.1		8.1	1.2	0.2	34.5	0.1	0.1	0.8	0.8
Delay (s)	58.6	13.3	11.8		64.8	18.6	11.2	88.5	46.6	45.9	55.2	53.9
Level of Service	E	B	B		E	B	B	F	D	D	E	D
Approach Delay (s)		16.3				19.7			71.8			53.9
Approach LOS		B				B			E			D

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	2000
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1642
Flt Permitted	1.00
Satd. Flow (perm)	1642
Volume (vph)	75
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	90
RTOR Reduction (vph)	82
Lane Group Flow (vph)	8
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	11.7
Effective Green, g (s)	11.2
Actuated g/C Ratio	0.09
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	147
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	52.0
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	52.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	UL	T	T	T	R	L
Maximum Queue (ft)	141	158	141	175	204	58	177	241	238	231	178	330
Average Queue (ft)	60	75	68	88	113	18	75	217	217	215	53	191
95th Queue (ft)	114	126	126	155	181	43	146	271	261	257	153	343
Link Distance (ft)			220	220	220	220		186	186	186		349
Upstream Blk Time (%)					0		0	18	20	20	0	3
Queuing Penalty (veh)					0		0	138	148	151	0	4
Storage Bay Dist (ft)	255	255					370				230	
Storage Blk Time (%)							0	18		20	0	
Queuing Penalty (veh)							0	13		30	1	

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	L	T	R
Maximum Queue (ft)	61	68	86	93	79	114
Average Queue (ft)	11	27	29	36	24	30
95th Queue (ft)	36	51	63	72	60	76
Link Distance (ft)	349	349	217	217	217	217
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	775	114	75	2156	121	208	16	119	110	48	90
v/c Ratio	0.30	0.25	0.12	0.51	0.67	0.12	0.89	0.06	0.36	0.37	0.24	0.36
Control Delay	63.0	15.4	3.8	71.0	21.1	8.1	91.7	45.1	10.2	61.2	52.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	15.4	3.8	71.0	21.2	8.1	91.7	45.1	10.2	61.2	52.9	13.1
Queue Length 50th (ft)	25	101	0	56	380	16	162	11	0	42	36	0
Queue Length 95th (ft)	61	220	37	132	780	70	#423	31	46	83	67	37
Internal Link Dist (ft)		206			177			389			222	
Turn Bay Length (ft)	255			370		230						
Base Capacity (vph)	313	3127	986	627	3214	1006	233	592	589	326	533	512
Starvation Cap Reductn	0	0	0	0	239	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.25	0.12	0.12	0.72	0.12	0.89	0.03	0.20	0.34	0.09	0.18

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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
Frt	1.00	1.00		1.00	1.00	0.85	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		0.95	1.00	1.00
Satd. Flow (prot)	1863	5344		1863	5353	1629	1863	1667		3614	1961	1641
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5344		1863	5353	1629	1863	1667		3614	1961	1641
Volume (vph)	18	902	9	15	2161	135	9	0	14	77	4	28
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.67	0.67	0.67	0.65	0.65	0.65
Adj. Flow (vph)	20	1013	10	17	2401	150	13	0	21	118	6	43
RTOR Reduction (vph)	0	0	0	0	0	28	0	19	0	0	0	37
Lane Group Flow (vph)	20	1023	0	17	2401	122	13	2	0	118	6	6
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			1			4						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	2.1	52.2		2.0	52.1	52.1	0.9	7.3		6.0	12.9	12.9
Effective Green, g (s)	2.6	53.2		2.5	53.1	53.1	1.4	7.3		7.0	12.9	12.9
Actuated g/C Ratio	0.03	0.62		0.03	0.62	0.62	0.02	0.08		0.08	0.15	0.15
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	56	3306		54	3305	1006	30	142		294	294	246
v/s Ratio Prot	c0.01	0.19		0.01	c0.45		0.01	0.00		c0.03	0.00	
v/s Ratio Perm						0.08						c0.00
v/c Ratio	0.36	0.31		0.31	0.73	0.12	0.43	0.01		0.40	0.02	0.03
Uniform Delay, d1	40.9	7.7		40.9	11.4	6.8	41.9	36.0		37.5	31.2	31.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1		1.2	0.9	0.1	7.1	0.0		0.7	0.0	0.0
Delay (s)	42.3	7.8		42.1	12.3	6.9	49.0	36.1		38.2	31.2	31.2
Level of Service	D	A		D	B	A	D	D		D	C	C
Approach Delay (s)		8.5			12.2			41.0			36.1	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	447	997	11	3138	484	47	318
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	486	1084	12	3411	526	51	346
RTOR Reduction (vph)	0	0	0	0	43	0	0
Lane Group Flow (vph)	486	1084	12	3411	483	51	346
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	35.3	160.2	3.3	128.2	128.2	11.9	190.0
Effective Green, g (s)	35.3	161.5	3.3	129.5	129.5	13.2	190.0
Actuated g/C Ratio	0.19	0.85	0.02	0.68	0.68	0.07	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	671	5733	32	4597	1136	251	1667
v/s Ratio Prot	c0.13	0.16	0.01	c0.51		0.01	
v/s Ratio Perm					0.29		c0.21
v/c Ratio	0.72	0.19	0.38	0.74	0.43	0.20	0.21
Uniform Delay, d1	72.8	2.5	92.3	19.5	13.6	83.4	0.0
Progression Factor	1.12	2.05	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.0	7.2	1.1	1.2	0.4	0.3
Delay (s)	83.7	5.3	99.6	20.6	14.7	83.8	0.3
Level of Service	F	A	F	C	B	F	A
Approach Delay (s)		29.5		20.1		11.0	
Approach LOS		C		C		B	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5287	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5287	
Volume (vph)	117	640	27	42	1691	1370	556	786	43	580	246	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	696	29	46	1838	1489	604	854	47	630	267	24
RTOR Reduction (vph)	0	0	0	0	0	140	0	0	35	0	6	0
Lane Group Flow (vph)	127	696	29	46	1838	1349	604	854	12	630	285	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	9.9	97.0	190.0	6.8	93.9	93.9	27.5	47.4	47.4	17.5	37.4	
Effective Green, g (s)	11.4	98.3	190.0	8.3	95.2	95.2	29.0	48.4	48.4	19.0	38.4	
Actuated g/C Ratio	0.06	0.52	1.00	0.04	0.50	0.50	0.15	0.25	0.25	0.10	0.20	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	217	3490	1667	158	3380	835	552	949	425	361	1069	
v/s Ratio Prot	c0.04	c0.10		0.01	0.27		c0.17	c0.23		c0.17	0.05	
v/s Ratio Perm			0.02			c0.81			0.01			
v/c Ratio	0.59	0.20	0.02	0.29	0.54	1.62	1.09	0.90	0.03	1.75	0.27	
Uniform Delay, d1	87.0	24.7	0.0	88.0	32.5	47.4	80.5	68.5	53.1	85.5	63.9	
Progression Factor	1.27	0.53	1.00	1.30	0.48	0.51	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	0.1	0.0	0.7	0.5	281.2	66.5	11.5	0.0	346.6	0.2	
Delay (s)	114.1	13.2	0.0	115.1	15.9	305.4	147.0	80.0	53.2	432.1	64.1	
Level of Service	F	B	A	F	B	F	F	E	D	F	E	
Approach Delay (s)		27.8			145.1			106.0			315.8	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	144.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	88	892	805	127	2062	41	740	49	109	33	80	143
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	970	875	138	2241	45	804	53	118	36	87	155
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	88	0	0	0
Lane Group Flow (vph)	96	970	875	138	2241	45	804	53	30	36	87	155
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	15.6	88.8	190.0	20.2	93.4	190.0	47.6	47.6	47.6	14.1	14.1	190.0
Effective Green, g (s)	15.6	90.1	190.0	20.2	94.7	190.0	48.6	48.6	48.6	15.1	15.1	190.0
Actuated g/C Ratio	0.08	0.47	1.00	0.11	0.50	1.00	0.26	0.26	0.26	0.08	0.08	1.00
Clearance Time (s)	4.0	5.3		4.0	5.3		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	153	3199	1667	198	3362	1667	924	502	426	287	156	1667
v/s Ratio Prot	0.05	0.14		c0.07	c0.33		c0.22	0.03		0.01	0.04	
v/s Ratio Perm			c0.53			0.03			0.02			0.09
v/c Ratio	0.63	0.30	0.52	0.70	0.67	0.03	0.87	0.11	0.07	0.13	0.56	0.09
Uniform Delay, d1	84.4	30.7	0.0	81.9	35.8	0.0	67.7	54.1	53.6	81.3	84.2	0.0
Progression Factor	1.00	1.00	1.00	0.94	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	0.2	1.2	8.1	0.8	0.0	9.2	0.1	0.1	0.3	5.2	0.1
Delay (s)	93.2	30.9	1.2	84.8	30.0	0.0	76.9	54.2	53.7	81.6	89.5	0.1
Level of Service	F	C	A	F	C	A	E	D	D	F	F	A
Approach Delay (s)		20.6			32.6			72.9			38.6	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	96	970	875	138	2241	45	804	53	118	36	87	155
v/c Ratio	0.63	0.30	0.52	0.70	0.67	0.03	0.87	0.11	0.23	0.12	0.56	0.09
Control Delay	101.7	32.7	1.2	89.7	31.5	0.0	78.2	52.5	8.2	81.0	97.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.7	32.7	1.2	89.7	31.5	0.0	78.2	52.5	8.2	81.0	97.4	0.1
Queue Length 50th (ft)	118	217	0	179	394	0	500	51	0	22	106	0
Queue Length 95th (ft)	184	288	0	m240	m490	m0	549	88	53	43	172	0
Internal Link Dist (ft)		670			841			82			906	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	196	3198	1667	265	3361	1667	1084	588	583	342	186	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.30	0.52	0.52	0.67	0.03	0.74	0.09	0.20	0.11	0.47	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	151	0	59	30	0	66	27	85	0	0	123	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	0	64	33	0	72	29	92	0	0	134	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											469	
pX, platoon unblocked	1.00	1.00	1.00	1.00	1.00		1.00					
vC, conflicting volume	395	323	172	387	361	92	210			92		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393	321	170	385	359	92	208			92		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	100	93	94	100	93	98			100		
cM capacity (veh/h)	514	582	872	521	554	965	1360			1502		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	228	33	72	29	92	210
Volume Left	164	33	0	29	0	0
Volume Right	64	0	72	0	0	76
cSH	581	521	965	1360	1700	1700
Volume to Capacity	0.39	0.06	0.07	0.02	0.05	0.12
Queue Length 95th (ft)	47	5	6	2	0	0
Control Delay (s)	15.1	12.4	9.0	7.7	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	15.1	10.1		1.9		0.0
Approach LOS	C	B				

Intersection Summary			
Average Delay	7.1		
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												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	39	0	57	26	0	11	15	62	18	23	179	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	0	62	28	0	12	16	67	20	25	195	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								986			1138	
pX, platoon unblocked												
vC, conflicting volume	372	370	200	422	365	77	205			87		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372	370	200	422	365	77	205			87		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	93	94	100	99	99			98		
cM capacity (veh/h)	565	544	841	491	547	984	1366			1509		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	104	40	103	230
Volume Left	42	28	16	25
Volume Right	62	12	20	11
cSH	702	577	1366	1509
Volume to Capacity	0.15	0.07	0.01	0.02
Queue Length 95th (ft)	13	6	1	1
Control Delay (s)	11.0	11.7	1.3	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.0	11.7	1.3	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	873	8	0	2285	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	949	9	0	2484	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	761			286		
pX, platoon unblocked			0.93		0.75	0.93
vC, conflicting volume			958		1781	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			812		976	130
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			756		186	836

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	380	380	198	828	828	828	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	8
cSH	1700	1700	1700	1700	1700	1700	836
Volume to Capacity	0.22	0.22	0.12	0.49	0.49	0.49	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	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	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	908	23	0	2211	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	987	25	0	2403	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	257			613		
pX, platoon unblocked			0.93		0.69	0.93
vC, conflicting volume			1012		1801	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			864		823	143
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			721		216	817

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	395	395	222	801	801	801	38
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	25	0	0	0	38
cSH	1700	1700	1700	1700	1700	1700	817
Volume to Capacity	0.23	0.23	0.13	0.47	0.47	0.47	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.6
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.6
Approach LOS							A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1704	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1704	1583
Volume (vph)	0	2736	1470	433	746	0	0	0	0	626	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	2792	1500	451	777	0	0	0	0	688	21	74
RTOR Reduction (vph)	0	0	185	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	2792	1315	451	777	0	0	0	0	353	356	14
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	986	286	4181					284	274	254
v/s Ratio Prot		0.52	c0.79	c0.24	0.15					0.20	c0.21	0.01
v/s Ratio Perm												
v/c Ratio		0.88	1.33	1.58	0.19					1.24	1.30	0.05
Uniform Delay, d1		23.9	28.0	58.0	3.8					57.5	57.5	48.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		3.6	157.2	275.8	0.1					135.5	158.9	0.1
Delay (s)		27.6	185.2	333.8	3.9					193.0	216.4	48.8
Level of Service		C	F	F	A					F	F	D
Approach Delay (s)		82.7			125.1			0.0			190.0	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM Average Control Delay	104.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	136.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	0.88	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	2933	1863	5353					1770	1704	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	2933	1863	5353					1770	1704	1583
Volume (vph)	0	2736	1470	433	746	0	0	0	0	626	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	2792	1500	451	777	0	0	0	0	688	21	74
RTOR Reduction (vph)	0	0	325	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	2792	1175	451	777	0	0	0	0	353	356	14
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	1734	286	4181					284	274	254
v/s Ratio Prot		c0.52	0.40	c0.24	0.15					0.20	c0.21	0.01
v/s Ratio Perm												
v/c Ratio		0.88	0.68	1.58	0.19					1.24	1.30	0.05
Uniform Delay, d1		23.9	19.1	58.0	3.8					57.5	57.5	48.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		3.6	1.6	275.8	0.1					135.5	158.9	0.1
Delay (s)		27.6	20.7	333.8	3.9					193.0	216.4	48.8
Level of Service		C	C	F	A					F	F	D
Approach Delay (s)		25.2			125.1			0.0			190.0	
Approach LOS		C			F			A			F	

Intersection Summary			
HCM Average Control Delay	65.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	100.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.97	1.00
Satd. Flow (prot)	1863	5353	1630	1863	5179		1770	1856	1667	1770	1814	1657
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1863	5353	1630	1863	5179		1770	1856	1667	1770	1814	1657
Volume (vph)	210	2268	696	169	692	159	206	187	596	203	63	266
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	226	2439	748	197	805	185	248	225	718	245	76	320
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	9	0	0	116
Lane Group Flow (vph)	226	2439	748	197	972	0	231	242	709	156	165	204
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)			5			3						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	23.3	75.6	156.2	18.6	70.9		25.2	25.2	43.8	17.3	17.3	40.6
Effective Green, g (s)	22.8	77.1	156.2	18.1	72.4		26.2	26.2	45.3	16.8	16.8	39.6
Actuated g/C Ratio	0.15	0.49	1.00	0.12	0.46		0.17	0.17	0.29	0.11	0.11	0.25
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	272	2642	1630	216	2401		297	311	526	190	195	420
v/s Ratio Prot	0.12	c0.46		0.11	0.19		0.13	0.13	c0.16	0.09	c0.09	0.07
v/s Ratio Perm			c0.46						0.26			0.05
v/c Ratio	0.83	0.92	0.46	0.91	0.40		0.78	0.78	1.35	0.82	0.85	0.48
Uniform Delay, d1	64.8	36.8	0.0	68.3	27.7		62.2	62.2	55.4	68.2	68.4	49.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.0	6.8	0.9	37.8	0.3		11.6	11.2	169.2	25.8	28.9	0.9
Delay (s)	83.8	43.6	0.9	106.1	28.0		73.8	73.4	224.7	94.0	97.4	50.5
Level of Service	F	D	A	F	C		E	E	F	F	F	D
Approach Delay (s)		36.9			41.0			164.7			73.2	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM Average Control Delay	64.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	156.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	94.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5225		1863	5353	1667	1863	3725	1652	1863	3725	1656
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5225		1863	5353	1667	1863	3725	1652	1863	3725	1656
Volume (vph)	560	2079	344	74	867	207	118	437	64	217	335	135
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	636	2362	391	82	963	230	126	465	68	238	368	148
RTOR Reduction (vph)	0	13	0	0	0	61	0	0	5	0	0	28
Lane Group Flow (vph)	636	2740	0	82	963	169	126	465	63	238	368	120
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	27.6	57.6		9.5	39.5	58.6	12.3	21.2	30.7	14.1	23.0	50.6
Effective Green, g (s)	28.6	58.6		10.5	40.5	58.6	12.3	23.2	33.7	14.1	25.0	53.6
Actuated g/C Ratio	0.23	0.48		0.09	0.33	0.48	0.10	0.19	0.28	0.12	0.20	0.44
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	844	2502		160	1771	798	187	706	509	215	761	779
v/s Ratio Prot	c0.18	c0.52		0.04	0.18	0.10	0.07	c0.12	0.01	c0.13	0.10	0.04
v/s Ratio Perm									0.03			0.04
v/c Ratio	0.75	1.10		0.51	0.54	0.21	0.67	0.66	0.12	1.11	0.48	0.15
Uniform Delay, d1	43.6	31.9		53.5	33.4	18.5	53.1	45.9	33.3	54.2	43.0	20.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	49.9		3.7	0.8	0.4	10.0	2.5	0.1	93.0	1.4	0.2
Delay (s)	48.2	81.8		57.2	34.2	18.9	63.1	48.4	33.4	147.1	44.4	20.9
Level of Service	D	F		E	C	B	E	D	C	F	D	C
Approach Delay (s)		75.5			32.9			49.7			72.2	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM Average Control Delay	63.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.5%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5353	1635	1863	5353	1667	1863	3725	1652	1863	3725	2914
Flt Permitted	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 (perm)	3614	5353	1635	1863	5353	1667	1863	3725	1652	1863	3725	2914
Volume (vph)	560	2079	344	74	867	207	118	437	64	217	335	135
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	636	2362	391	82	963	230	126	465	68	238	368	148
RTOR Reduction (vph)	0	0	47	0	0	61	0	0	5	0	0	49
Lane Group Flow (vph)	636	2362	344	82	963	169	126	465	63	238	368	99
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	27.6	57.6	57.6	9.5	39.5	58.6	12.3	21.2	30.7	14.1	23.0	50.6
Effective Green, g (s)	28.6	58.6	58.6	10.5	40.5	58.6	12.3	23.2	33.7	14.1	25.0	53.6
Actuated g/C Ratio	0.23	0.48	0.48	0.09	0.33	0.48	0.10	0.19	0.28	0.12	0.20	0.44
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0	6.0	4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	844	2563	783	160	1771	798	187	706	509	215	761	1371
v/s Ratio Prot	c0.18	c0.44		0.04	0.18	0.10	0.07	c0.12	0.01	c0.13	0.10	0.02
v/s Ratio Perm			0.21						0.03			0.02
v/c Ratio	0.75	0.92	0.44	0.51	0.54	0.21	0.67	0.66	0.12	1.11	0.48	0.07
Uniform Delay, d1	43.6	29.8	21.1	53.5	33.4	18.5	53.1	45.9	33.3	54.2	43.0	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	6.6	1.1	3.7	0.8	0.4	10.0	2.5	0.1	93.0	1.4	0.0
Delay (s)	48.2	36.4	22.2	57.2	34.2	18.9	63.1	48.4	33.4	147.1	44.4	20.0
Level of Service	D	D	C	E	C	B	E	D	C	F	D	C
Approach Delay (s)		37.0			32.9			49.7			72.0	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	41.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.2%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5348		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5348		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	213	2285	12	48	1016	250	6	228	38	254	140	119
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.94	0.94	0.94
Adj. Flow (vph)	239	2567	13	53	1116	275	7	265	44	270	149	127
RTOR Reduction (vph)	0	0	0	0	0	51	0	0	20	0	0	69
Lane Group Flow (vph)	239	2580	0	53	1116	224	7	265	24	270	149	58
Confl. Peds. (#/hr)	2		12	12		2	6		8	8		6
Confl. Bikes (#/hr)			3			1			1			1
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	25.1	91.0		7.6	73.5	106.9	1.9	20.1	32.7	28.4	45.1	75.2
Effective Green, g (s)	24.6	92.0		8.1	74.5	108.4	5.9	21.1	33.2	32.4	46.1	75.7
Actuated g/C Ratio	0.15	0.55		0.05	0.45	0.65	0.04	0.13	0.20	0.19	0.28	0.45
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	274	2944		90	2387	1081	66	470	331	361	1028	755
v/s Ratio Prot	c0.13	c0.48		0.03	0.21	0.13	0.00	c0.07	0.01	c0.14	0.04	0.03
v/s Ratio Perm												
v/c Ratio	0.87	0.88		0.59	0.47	0.21	0.11	0.56	0.07	0.75	0.14	0.08
Uniform Delay, d1	69.7	32.6		77.9	32.4	11.9	78.0	68.7	54.4	63.5	45.6	25.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.8	4.0		9.5	0.7	0.3	1.0	2.2	0.2	10.9	0.1	0.1
Delay (s)	94.5	36.6		87.4	33.1	12.2	79.0	70.9	54.6	74.4	45.8	26.0
Level of Service	F	D		F	C	B	E	E	D	E	D	C
Approach Delay (s)		41.5			31.1			68.8			55.3	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	167.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	5.0	5.0	4.0	4.0	5.0
Lane Util. Factor	0.97	0.91	1.00		1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	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
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	5353	1613		1863	5353	1632	1863	1961	1644	3614	1961
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	5353	1613		1863	5353	1632	1863	1961	1644	3614	1961
Volume (vph)	209	2008	259	69	115	997	126	196	45	124	270	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92	0.83	0.83
Adj. Flow (vph)	227	2183	282	75	122	1061	134	213	49	135	325	60
RTOR Reduction (vph)	0	0	74	0	0	0	59	0	0	60	0	0
Lane Group Flow (vph)	227	2183	208	0	197	1061	75	213	49	75	325	60
Confl. Peds. (#/hr)	5		4		4		5	3		2	2	
Confl. Bikes (#/hr)			1				3					
Turn Type	Prot		Perm	Prot	Prot		Perm	Prot		Perm	Prot	
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2				6			8		
Actuated Green, G (s)	13.2	66.6	66.6		16.2	69.6	69.6	14.6	16.1	16.1	12.1	14.1
Effective Green, g (s)	13.2	67.6	67.6		16.2	70.6	70.6	14.1	15.6	16.6	13.1	13.6
Actuated g/C Ratio	0.10	0.52	0.52		0.13	0.55	0.55	0.11	0.12	0.13	0.10	0.11
Clearance Time (s)	4.0	5.0	5.0		4.0	5.0	5.0	4.5	4.5	4.5	5.0	4.5
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	368	2794	842		233	2918	890	203	236	211	366	206
v/s Ratio Prot	0.06	c0.41			c0.11	c0.20		c0.11	0.02		0.09	0.03
v/s Ratio Perm			0.13				0.05			c0.05		
v/c Ratio	0.62	0.78	0.25		0.85	0.36	0.08	1.05	0.21	0.35	0.89	0.29
Uniform Delay, d1	55.7	25.0	17.0		55.4	16.7	14.0	57.7	51.4	51.6	57.5	53.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	2.3	0.7		23.5	0.4	0.2	76.7	0.4	1.0	21.9	0.8
Delay (s)	58.8	27.2	17.7		78.9	17.1	14.2	134.4	51.8	52.6	79.4	54.3
Level of Service	E	C	B		E	B	B	F	D	D	E	D
Approach Delay (s)		28.9				25.5			96.4			67.5
Approach LOS		C				C			F			E

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	129.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	2000
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1642
Flt Permitted	1.00
Satd. Flow (perm)	1642
Volume (vph)	174
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	210
RTOR Reduction (vph)	188
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	14.1
Effective Green, g (s)	13.6
Actuated g/C Ratio	0.11
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	172
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.13
Uniform Delay, d1	52.6
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	52.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	UL	T	T	T	R	L
Maximum Queue (ft)	159	181	266	277	249	213	174	242	235	236	174	262
Average Queue (ft)	115	143	221	226	225	67	159	206	159	170	89	119
95th Queue (ft)	174	199	266	266	238	143	208	288	253	253	189	217
Link Distance (ft)			220	220	220	220		181	181	181		346
Upstream Blk Time (%)			23	19	38	0	22	37	7	7	0	
Queuing Penalty (veh)			155	130	258	3	0	177	35	33	0	
Storage Bay Dist (ft)	255	255					230				230	
Storage Blk Time (%)			23				22	37		7	0	
Queuing Penalty (veh)			76				74	68		17	1	

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	L	T	R
Maximum Queue (ft)	96	113	204	197	124	98
Average Queue (ft)	28	41	105	111	37	41
95th Queue (ft)	71	87	177	185	89	77
Link Distance (ft)	346	346	212	212	212	212
Upstream Blk Time (%)			0	1	0	
Queuing Penalty (veh)			0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	2183	282	197	1061	134	213	49	135	325	60	210
v/c Ratio	0.62	0.78	0.31	0.85	0.36	0.14	1.05	0.21	0.50	0.89	0.29	0.58
Control Delay	64.3	29.1	10.0	86.7	19.4	4.4	132.0	50.9	31.2	83.8	54.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	29.1	10.0	86.7	19.4	4.4	132.0	50.9	31.2	83.8	54.8	12.8
Queue Length 50th (ft)	90	474	48	156	160	1	~175	37	51	133	47	0
Queue Length 95th (ft)	160	#858	156	#385	334	46	#448	73	110	#259	80	46
Internal Link Dist (ft)		238			186			394			222	
Turn Bay Length (ft)	255			230		230						
Base Capacity (vph)	600	2791	913	232	2911	945	203	550	520	366	525	593
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.78	0.31	0.85	0.36	0.14	1.05	0.09	0.26	0.89	0.11	0.35

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Volume (vph)	75	2289	24	25	1244	264	10	2	10	317	9	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.55	0.55	0.55	0.75	0.75	0.75
Adj. Flow (vph)	81	2461	26	27	1352	287	18	4	18	423	12	67
RTOR Reduction (vph)	0	0	0	0	0	117	0	17	0	0	0	54
Lane Group Flow (vph)	81	2487	0	27	1352	170	18	5	0	423	12	13
Confl. Peds. (#/hr)			1	1			14		1	1		14
Confl. Bikes (#/hr)			8			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.5	48.7		2.4	44.6	44.6	2.3	7.0		12.8	18.0	18.0
Effective Green, g (s)	7.0	49.7		2.9	45.6	45.6	2.8	7.0		13.8	18.0	18.0
Actuated g/C Ratio	0.08	0.56		0.03	0.51	0.51	0.03	0.08		0.15	0.20	0.20
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	146	2970		60	2730	832	58	133		558	395	328
v/s Ratio Prot	c0.04	c0.47		0.01	0.25		0.01	0.00		c0.12	0.01	
v/s Ratio Perm						0.10						c0.01
v/c Ratio	0.55	0.84		0.45	0.50	0.20	0.31	0.04		0.76	0.03	0.04
Uniform Delay, d1	39.7	16.5		42.5	14.4	12.0	42.4	38.1		36.2	28.7	28.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	2.4		1.9	0.2	0.2	2.2	0.1		5.6	0.0	0.0
Delay (s)	42.3	18.9		44.4	14.6	12.2	44.6	38.2		41.8	28.7	28.8
Level of Service	D	B		D	B	B	D	D		D	C	C
Approach Delay (s)		19.6			14.7			41.1			39.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	480	3010	58	1598	137	419	593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	3272	63	1737	149	455	645
RTOR Reduction (vph)	0	0	0	0	20	0	0
Lane Group Flow (vph)	522	3272	63	1737	129	455	645
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	32.8	135.4	11.8	114.4	114.4	28.2	190.0
Effective Green, g (s)	32.8	136.7	11.8	115.7	115.7	29.5	190.0
Actuated g/C Ratio	0.17	0.72	0.06	0.61	0.61	0.16	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	624	4853	116	4107	1015	561	1667
v/s Ratio Prot	c0.14	c0.49	0.03	0.26		c0.13	
v/s Ratio Perm					0.08		0.39
v/c Ratio	0.84	0.67	0.54	0.42	0.13	0.81	0.39
Uniform Delay, d1	76.0	14.5	86.5	19.6	15.7	77.6	0.0
Progression Factor	1.12	0.71	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1	5.1	0.3	0.3	8.7	0.7
Delay (s)	85.7	10.4	91.6	19.9	16.0	86.3	0.7
Level of Service	F	B	F	B	B	F	A
Approach Delay (s)		20.8		21.9		36.1	
Approach LOS		C		C		D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5318	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5318	
Volume (vph)	207	2083	309	262	953	780	127	547	214	1150	1321	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	2264	336	285	1036	848	138	595	233	1250	1436	65
RTOR Reduction (vph)	0	0	0	0	0	307	0	0	91	0	3	0
Lane Group Flow (vph)	225	2264	336	285	1036	542	138	595	142	1250	1498	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	16.1	59.6	190.0	22.6	66.1	66.1	9.4	37.0	37.0	48.5	77.1	
Effective Green, g (s)	17.6	60.9	190.0	24.1	67.4	67.4	10.9	38.0	38.0	51.0	78.1	
Actuated g/C Ratio	0.09	0.32	1.00	0.13	0.35	0.35	0.06	0.20	0.20	0.27	0.41	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	6.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	335	2162	1667	458	2393	591	207	745	333	970	2186	
v/s Ratio Prot	0.06	c0.34		c0.08	0.15		0.04	c0.16		c0.35	0.28	
v/s Ratio Perm			0.20			c0.32			0.09			
v/c Ratio	0.67	1.05	0.20	0.62	0.43	0.92	0.67	0.80	0.43	1.29	0.69	
Uniform Delay, d1	83.4	64.5	0.0	78.6	46.7	58.6	87.8	72.4	66.5	69.5	45.9	
Progression Factor	1.33	0.41	1.00	1.10	1.19	1.83	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	29.0	0.2	2.4	0.5	20.1	7.9	6.3	1.2	137.7	1.0	
Delay (s)	113.7	55.6	0.2	88.6	56.3	127.2	95.6	78.7	67.7	207.2	46.9	
Level of Service	F	E	A	F	E	F	F	E	E	F	D	
Approach Delay (s)		53.6			88.3			78.4			119.7	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM Average Control Delay	85.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.6%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	178	2304	1296	173	1009	53	834	129	149	28	144	132
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	2504	1409	188	1097	58	907	140	162	30	157	143
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	89	0	0	0
Lane Group Flow (vph)	193	2504	1409	188	1097	58	907	140	73	30	157	143
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	23.6	79.4	190.0	21.9	77.7	190.0	50.5	50.5	50.5	18.2	18.2	190.0
Effective Green, g (s)	24.6	80.4	190.0	22.9	78.7	190.0	51.5	51.5	51.5	19.2	19.2	190.0
Actuated g/C Ratio	0.13	0.42	1.00	0.12	0.41	1.00	0.27	0.27	0.27	0.10	0.10	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	241	2854	1667	225	2794	1667	980	532	452	365	198	1667
v/s Ratio Prot	0.10	c0.37		0.10	0.16		c0.25	0.07		0.01	0.08	
v/s Ratio Perm			c0.85			0.03			0.04			0.09
v/c Ratio	0.80	0.88	0.85	0.84	0.39	0.03	0.93	0.26	0.16	0.08	0.79	0.09
Uniform Delay, d1	80.3	50.3	0.0	81.7	38.9	0.0	67.4	54.4	52.8	77.4	83.5	0.0
Progression Factor	1.00	1.00	1.00	0.66	1.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.0	4.2	5.5	21.9	0.4	0.0	14.2	0.4	0.2	0.1	20.2	0.1
Delay (s)	98.3	54.5	5.5	75.9	73.4	0.0	81.6	54.7	53.0	77.5	103.7	0.1
Level of Service	F	D	A	E	E	A	F	D	D	E	F	A
Approach Delay (s)		39.7			70.6			74.7			56.4	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM Average Control Delay	52.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	193	2504	1409	188	1097	58	907	140	162	30	157	143
v/c Ratio	0.80	0.88	0.85	0.84	0.39	0.03	0.93	0.26	0.30	0.08	0.79	0.09
Control Delay	103.6	55.3	5.5	81.8	75.1	0.0	82.6	55.5	16.3	77.4	109.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	55.3	5.5	81.8	75.1	0.0	82.6	55.5	16.3	77.4	109.8	0.1
Queue Length 50th (ft)	235	860	0	245	406	0	568	137	37	18	194	0
Queue Length 95th (ft)	334	900	0	#364	445	m0	#661	206	106	37	#307	0
Internal Link Dist (ft)		690			684			107			258	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	265	2853	1667	235	2792	1667	1008	547	553	380	206	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.88	0.85	0.80	0.39	0.03	0.90	0.26	0.29	0.08	0.76	0.09

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	120	0	41	19	0	43	76	202	0	0	239	185
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	125	0	43	20	0	45	79	210	0	0	249	193
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											578	
pX, platoon unblocked	1.00	1.00	1.00	1.00	1.00		1.00					
vC, conflicting volume	759	714	345	757	810	210	442			210		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	758	713	343	756	810	210	440			210		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	57	100	94	93	100	95	93			100		
cM capacity (veh/h)	289	331	697	287	291	830	1116			1360		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	168	20	45	79	210	442
Volume Left	125	20	0	79	0	0
Volume Right	43	0	45	0	0	193
cSH	339	287	830	1116	1700	1700
Volume to Capacity	0.49	0.07	0.05	0.07	0.12	0.26
Queue Length 95th (ft)	65	6	4	6	0	0
Control Delay (s)	25.6	18.5	9.6	8.5	0.0	0.0
Lane LOS	D	C	A	A		
Approach Delay (s)	25.6	12.3		2.3		0.0
Approach LOS	D	B				

Intersection Summary			
Average Delay	6.0		
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			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	0	22	10	0	4	56	258	62	62	199	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	0	24	11	0	4	61	280	67	67	216	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								763				
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	812	841	237	832	828	314	258			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	802	833	237	822	819	277	258			312		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	96	100	99	95			94		
cM capacity (veh/h)	263	260	802	249	265	723	1307			1184		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	15	409	325
Volume Left	17	11	61	67
Volume Right	24	4	67	41
cSH	431	306	1307	1184
Volume to Capacity	0.10	0.05	0.05	0.06
Queue Length 95th (ft)	8	4	4	5
Control Delay (s)	14.2	17.4	1.6	2.1
Lane LOS	B	C	A	A
Approach Delay (s)	14.2	17.4	1.6	2.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	2470	20	0	1367	0	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2685	22	0	1486	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	724			318		
pX, platoon unblocked			0.57		0.62	0.57
vC, conflicting volume			2707		3191	906
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2481		2497	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			103		15	613

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1074	1074	559	495	495	495	7
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	22	0	0	0	7
cSH	1700	1700	1700	1700	1700	1700	613
Volume to Capacity	0.63	0.63	0.33	0.29	0.29	0.29	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.9
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	2402	69	0	1307	0	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2611	75	0	1421	0	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	266			586		
pX, platoon unblocked			0.66		0.75	0.66
vC, conflicting volume			2686		3122	908
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2527		2165	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			116		30	720

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1044	1044	597	474	474	474	25
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	75	0	0	0	25
cSH	1700	1700	1700	1700	1700	1700	720
Volume to Capacity	0.61	0.61	0.35	0.28	0.28	0.28	0.03
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.2
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix F – Level of Service Worksheets: 2030 Baseline Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1500	1583
Volume (vph)	0	395	303	369	3439	0	0	0	0	157	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	439	337	397	3698	0	0	0	0	176	4	606
RTOR Reduction (vph)	0	0	185	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	439	152	397	3698	0	0	0	0	176	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		58.5	58.5	31.6	94.6					27.5	27.5	27.5
Effective Green, g (s)		60.0	60.0	31.1	96.1					28.5	28.5	28.5
Actuated g/C Ratio		0.45	0.45	0.23	0.72					0.21	0.21	0.21
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2422	754	437	3880					380	322	340
v/s Ratio Prot		0.08	0.09	0.21	c0.69					0.10	c0.20	0.19
v/s Ratio Perm												
v/c Ratio		0.18	0.20	0.91	0.95					0.46	0.95	0.89
Uniform Delay, d1		21.7	21.9	49.4	16.2					45.4	51.4	50.5
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.4	22.3	6.9					0.9	37.2	23.3
Delay (s)		21.8	22.3	71.6	23.1					46.3	88.5	73.8
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		22.0			27.8			0.0			73.4	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	33.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	132.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.99		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	0.96	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1863	5353	1632	1863	5292		1770	1791	1667	1770	1843	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (perm)	1863	5353	1632	1863	5292		1770	1791	1667	1770	1843	1667
Volume (vph)	95	322	132	218	2246	156	1539	174	124	90	60	225
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.96	0.96	0.96	0.70	0.70	0.70
Adj. Flow (vph)	114	388	159	237	2441	170	1603	181	129	129	86	321
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	34	0	0	2
Lane Group Flow (vph)	114	388	159	237	2607	0	869	915	95	105	110	319
Confl. Bikes (#/hr)			2			5						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	10.5	46.0	170.2	25.5	61.0		65.0	65.0	90.5	14.2	14.2	24.7
Effective Green, g (s)	10.0	47.5	170.2	25.0	62.5		66.0	66.0	92.0	13.7	13.7	23.7
Actuated g/C Ratio	0.06	0.28	1.00	0.15	0.37		0.39	0.39	0.54	0.08	0.08	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	109	1494	1632	274	1943		686	695	940	142	148	232
v/s Ratio Prot	0.06	0.07		0.13	c0.49		0.49	c0.51	0.02	0.06	0.06	c0.08
v/s Ratio Perm			0.10						0.04			0.11
v/c Ratio	1.05	0.26	0.10	0.86	1.34		1.27	1.32	0.10	0.74	0.74	1.38
Uniform Delay, d1	80.1	47.7	0.0	71.0	53.8		52.1	52.1	19.0	76.5	76.5	73.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.1	0.4	0.1	23.5	157.2		131.4	152.5	0.0	20.3	20.3	194.1
Delay (s)	179.2	48.1	0.1	94.5	211.1		183.5	204.6	19.1	96.8	96.8	267.3
Level of Service	F	D	A	F	F		F	F	B	F	F	F
Approach Delay (s)		59.2			201.4			182.5			198.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	179.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	170.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.99	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	0.96		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)	3614	5125		1863	5353	1667	1863	3725	1649	1863	3725	1651
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5125		1863	5353	1667	1863	3725	1649	1863	3725	1651
Volume (vph)	111	454	149	43	1748	68	457	387	82	134	652	776
Peak-hour factor, PHF	0.79	0.79	0.79	0.91	0.91	0.91	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	141	575	189	47	1921	75	544	461	98	146	709	843
RTOR Reduction (vph)	0	37	0	0	0	22	0	0	59	0	0	3
Lane Group Flow (vph)	141	727	0	47	1921	53	544	461	39	146	709	840
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	10.0	46.4		8.9	45.3	66.0	26.1	41.5	50.4	15.7	31.1	41.1
Effective Green, g (s)	11.0	47.4		9.9	46.3	66.0	26.1	43.5	53.4	15.7	33.1	44.1
Actuated g/C Ratio	0.08	0.36		0.07	0.35	0.50	0.20	0.33	0.40	0.12	0.25	0.33
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	300	1833		139	1871	830	367	1223	714	221	931	599
v/s Ratio Prot	0.04	0.14		0.03	c0.36	0.03	c0.29	0.12	0.00	0.08	0.19	c0.12
v/s Ratio Perm									0.02			0.39
v/c Ratio	0.47	0.40		0.34	1.03	0.06	1.48	0.38	0.06	0.66	0.76	1.40
Uniform Delay, d1	58.0	31.8		58.2	43.1	17.2	53.2	34.1	24.1	55.9	46.0	44.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.4		2.0	27.9	0.1	231.2	0.3	0.0	7.9	4.8	190.7
Delay (s)	60.4	32.2		60.2	71.0	17.3	284.4	34.4	24.2	63.8	50.8	234.9
Level of Service	E	C		E	E	B	F	C	C	E	D	F
Approach Delay (s)		36.6			68.8			156.8			143.3	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM Average Control Delay	102.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	132.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	106	614	5	107	1876	147	20	188	61	198	362	173
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.73	0.73	0.73
Adj. Flow (vph)	118	682	6	116	2039	160	26	244	79	271	496	237
RTOR Reduction (vph)	0	0	0	0	0	23	0	0	42	0	0	56
Lane Group Flow (vph)	118	688	0	116	2039	137	26	244	37	271	496	181
Confl. Peds. (#/hr)	6					6	8					8
Confl. Bikes (#/hr)						7			2			
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	14.3	81.8		14.6	82.1	113.5	6.0	16.5	36.1	26.4	35.4	54.7
Effective Green, g (s)	13.8	82.8		15.1	83.1	115.0	10.0	17.5	36.6	30.4	36.4	55.2
Actuated g/C Ratio	0.09	0.52		0.09	0.52	0.72	0.06	0.11	0.23	0.19	0.23	0.35
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	161	2779		177	2792	1203	117	409	383	356	851	578
v/s Ratio Prot	c0.06	0.13		0.06	c0.38	0.08	0.01	0.07	0.02	c0.15	c0.13	0.11
v/s Ratio Perm												
v/c Ratio	0.73	0.25		0.66	0.73	0.11	0.22	0.60	0.10	0.76	0.58	0.31
Uniform Delay, d1	71.0	21.1		69.6	29.4	6.7	71.0	67.5	48.3	61.0	54.7	38.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.8	0.2		8.4	1.7	0.1	1.3	3.1	0.2	11.8	1.6	0.7
Delay (s)	86.7	21.3		78.0	31.2	6.8	72.3	70.7	48.5	72.8	56.3	38.8
Level of Service	F	C		E	C	A	E	E	D	E	E	D
Approach Delay (s)		30.9			31.8			65.8			56.6	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	159.3	Sum of lost time (s)	6.5
Intersection Capacity Utilization	73.9%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	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	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1614	1863	5353	1633	1863	3531		3614	1961	1642
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1614	1863	5353	1633	1863	3531		3614	1961	1642
Volume (vph)	157	707	52	18	2027	149	22	15	7	91	42	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.83	0.83	0.83
Adj. Flow (vph)	171	768	57	19	2156	159	25	17	8	110	51	90
RTOR Reduction (vph)	0	0	18	0	0	33	0	7	0	0	0	80
Lane Group Flow (vph)	171	768	39	19	2156	126	25	18	0	110	51	10
Confl. Peds. (#/hr)	5		4	4		5	3		2	2		3
Confl. Bikes (#/hr)			1			3						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	10.0	85.5	85.5	2.9	78.4	78.4	4.6	9.5		9.1	14.5	14.5
Effective Green, g (s)	10.0	86.5	86.5	2.9	79.4	79.4	4.1	9.0		10.1	14.0	14.0
Actuated g/C Ratio	0.08	0.69	0.69	0.02	0.63	0.63	0.03	0.07		0.08	0.11	0.11
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	288	3690	1112	43	3387	1033	61	253		291	219	183
v/s Ratio Prot	c0.05	0.14		0.01	c0.40		0.01	0.00		c0.03	c0.03	
v/s Ratio Perm			0.02			0.08						0.01
v/c Ratio	0.59	0.21	0.04	0.44	0.64	0.12	0.41	0.07		0.38	0.23	0.05
Uniform Delay, d1	55.8	7.1	6.2	60.5	14.2	9.2	59.5	54.3		54.7	50.9	49.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.3	0.1	0.1	7.1	0.9	0.2	4.4	0.1		0.8	0.5	0.1
Delay (s)	59.1	7.2	6.3	67.6	15.1	9.4	63.9	54.5		55.5	51.4	50.0
Level of Service	E	A	A	E	B	A	E	D		E	D	D
Approach Delay (s)		16.1			15.1			59.2			52.7	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	125.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	171	768	57	19	2156	159	25	25	110	51	90
v/c Ratio	0.58	0.20	0.05	0.19	0.64	0.15	0.25	0.07	0.37	0.23	0.33
Control Delay	64.4	9.6	4.3	66.4	18.2	7.0	66.9	36.5	59.7	50.5	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	9.6	4.3	66.4	18.3	7.0	66.9	36.5	59.7	50.5	12.2
Queue Length 50th (ft)	64	51	0	14	343	19	19	6	41	38	0
Queue Length 95th (ft)	132	202	25	49	767	84	57	18	84	69	36
Internal Link Dist (ft)		967			784			389		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	331	3825	1166	158	3395	1067	147	994	332	573	544
Starvation Cap Reductn	0	0	0	0	290	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.20	0.05	0.12	0.69	0.15	0.17	0.03	0.33	0.09	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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
Frt	1.00	1.00		1.00	1.00	0.85	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		0.95	1.00	1.00
Satd. Flow (prot)	1863	5325		1863	5353	1629	1863	1667		3614	1961	1641
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5325		1863	5353	1629	1863	1667		3614	1961	1641
Volume (vph)	46	743	23	20	2096	176	9	0	14	77	4	28
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.67	0.67	0.67	0.65	0.65	0.65
Adj. Flow (vph)	52	835	26	22	2329	196	13	0	21	118	6	43
RTOR Reduction (vph)	0	1	0	0	0	38	0	19	0	0	0	37
Lane Group Flow (vph)	52	860	0	22	2329	158	13	2	0	118	6	6
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			1			4						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	4.2	55.1		2.2	53.1	53.1	0.9	7.4		6.0	13.0	13.0
Effective Green, g (s)	4.7	56.1		2.7	54.1	54.1	1.4	7.4		7.0	13.0	13.0
Actuated g/C Ratio	0.05	0.63		0.03	0.61	0.61	0.02	0.08		0.08	0.15	0.15
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	98	3349		56	3247	988	29	138		284	286	239
v/s Ratio Prot	c0.03	0.16		0.01	c0.44		0.01	0.00		c0.03	0.00	
v/s Ratio Perm						0.10						c0.00
v/c Ratio	0.53	0.26		0.39	0.72	0.16	0.45	0.01		0.42	0.02	0.03
Uniform Delay, d1	41.2	7.3		42.4	12.2	7.6	43.5	37.5		39.2	32.6	32.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		1.7	0.9	0.1	7.8	0.0		0.7	0.0	0.0
Delay (s)	43.9	7.4		44.1	13.1	7.8	51.3	37.6		39.9	32.7	32.7
Level of Service	D	A		D	B	A	D	D		D	C	C
Approach Delay (s)		9.5			13.0			42.8			37.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	459	1015	11	4122	750	85	528
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	499	1103	12	4480	815	92	574
RTOR Reduction (vph)	0	0	0	0	54	0	0
Lane Group Flow (vph)	499	1103	12	4480	761	92	574
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	37.3	157.6	3.3	123.6	123.6	14.5	190.0
Effective Green, g (s)	37.3	158.9	3.3	124.9	124.9	15.8	190.0
Actuated g/C Ratio	0.20	0.84	0.02	0.66	0.66	0.08	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	709	5641	32	4434	1096	301	1667
v/s Ratio Prot	c0.14	0.16	0.01	c0.66		0.03	
v/s Ratio Perm					0.46		c0.34
v/c Ratio	0.70	0.20	0.38	1.01	0.69	0.31	0.34
Uniform Delay, d1	71.2	3.0	92.3	32.5	20.5	81.9	0.0
Progression Factor	0.79	2.32	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.1	7.2	16.1	3.6	0.6	0.6
Delay (s)	58.7	7.1	99.6	48.7	24.1	82.5	0.6
Level of Service	E	A	F	D	C	F	A
Approach Delay (s)		23.2		45.0		11.9	
Approach LOS		C		D		B	

Intersection Summary			
HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5241	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5241	
Volume (vph)	166	900	17	54	2520	1320	711	779	54	462	205	33
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	978	18	59	2739	1435	773	847	59	502	223	36
RTOR Reduction (vph)	0	0	0	0	0	139	0	0	44	0	12	0
Lane Group Flow (vph)	180	978	18	59	2739	1296	773	847	15	502	247	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	11.3	95.3	190.0	8.7	92.7	92.7	27.5	47.2	47.2	17.5	37.2	
Effective Green, g (s)	12.8	96.6	190.0	10.2	94.0	94.0	29.0	48.2	48.2	19.0	38.2	
Actuated g/C Ratio	0.07	0.51	1.00	0.05	0.49	0.49	0.15	0.25	0.25	0.10	0.20	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	243	3429	1667	194	3337	825	552	945	423	361	1054	
v/s Ratio Prot	c0.05	c0.14		0.02	0.41		c0.21	c0.23		0.14	0.05	
v/s Ratio Perm			0.01			c0.78			0.01			
v/c Ratio	0.74	0.29	0.01	0.30	0.82	1.57	1.40	0.90	0.04	1.39	0.23	
Uniform Delay, d1	87.0	26.9	0.0	86.5	40.8	48.0	80.5	68.5	53.4	85.5	63.6	
Progression Factor	1.16	0.61	1.00	1.28	0.47	0.31	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.5	0.2	0.0	0.3	0.9	259.0	190.9	11.2	0.0	192.0	0.2	
Delay (s)	111.4	16.7	0.0	111.0	20.2	273.8	271.4	79.7	53.4	277.5	63.8	
Level of Service	F	B	A	F	C	F	F	E	D	F	E	
Approach Delay (s)		30.9			107.4			167.1			204.8	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	118.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	37	1281	1153	164	3081	44	1293	40	178	8	52	18
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1392	1253	178	3349	48	1405	43	193	9	57	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	132	0	0	0
Lane Group Flow (vph)	40	1392	1253	178	3349	48	1405	43	61	9	57	20
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	7.8	80.9	190.0	21.2	94.3	190.0	59.0	59.0	59.0	9.6	9.6	190.0
Effective Green, g (s)	7.8	82.2	190.0	21.2	95.6	190.0	60.0	60.0	60.0	10.6	10.6	190.0
Actuated g/C Ratio	0.04	0.43	1.00	0.11	0.50	1.00	0.32	0.32	0.32	0.06	0.06	1.00
Clearance Time (s)	4.0	5.3		4.0	5.3		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	76	2918	1667	208	3394	1667	1141	619	526	202	109	1667
v/s Ratio Prot	0.02	0.21		0.10	c0.50		c0.39	0.02		0.00	0.03	
v/s Ratio Perm			c0.75			0.03			0.04			0.01
v/c Ratio	0.53	0.48	0.75	0.86	0.99	0.03	1.23	0.07	0.12	0.04	0.52	0.01
Uniform Delay, d1	89.3	38.5	0.0	82.9	46.6	0.0	65.0	45.5	46.2	84.9	87.2	0.0
Progression Factor	1.00	1.00	1.00	1.02	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	0.6	3.2	12.1	6.6	0.0	111.9	0.1	0.1	0.1	5.8	0.0
Delay (s)	97.6	39.1	3.2	96.5	49.8	0.0	176.9	45.5	46.3	85.0	93.0	0.0
Level of Service	F	D	A	F	D	A	F	D	D	F	F	A
Approach Delay (s)		23.2			51.5			158.1			70.6	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	64.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	40	1392	1253	178	3349	48	1405	43	193	9	57	20
v/c Ratio	0.43	0.48	0.75	0.86	0.98	0.03	1.23	0.07	0.29	0.04	0.52	0.01
Control Delay	102.2	39.4	3.2	98.0	47.7	0.0	163.9	46.0	6.4	85.1	104.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.2	39.4	3.2	98.0	47.7	0.0	163.9	46.0	6.4	85.1	104.1	0.0
Queue Length 50th (ft)	49	364	0	234	~676	0	~1111	38	0	5	71	0
Queue Length 95th (ft)	97	398	0	m259	m680	m0	#1245	73	63	17	127	0
Internal Link Dist (ft)		670			841			82			906	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	98	2919	1667	216	3423	1667	1141	619	658	209	114	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.48	0.75	0.82	0.98	0.03	1.23	0.07	0.29	0.04	0.50	0.01

Intersection Summary

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1705	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1705	1583
Volume (vph)	0	3071	1468	339	796	0	0	0	0	538	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	3134	1498	353	829	0	0	0	0	591	21	74
RTOR Reduction (vph)	0	0	191	0	0	0	0	0	0	0	0	62
Lane Group Flow (vph)	0	3134	1307	353	829	0	0	0	0	305	307	12
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	986	286	4181					284	274	254
v/s Ratio Prot		0.59	c0.78	c0.19	0.15					0.17	c0.18	0.01
v/s Ratio Perm												
v/c Ratio		0.99	1.33	1.23	0.20					1.07	1.12	0.05
Uniform Delay, d1		27.6	28.0	58.0	3.9					57.5	57.5	48.6
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		13.8	153.6	131.9	0.1					74.4	90.7	0.1
Delay (s)		41.4	181.6	189.9	4.0					131.9	148.2	48.7
Level of Service		D	F	F	A					F	F	D
Approach Delay (s)		86.8			59.5			0.0			130.2	
Approach LOS		F			E			A			F	

Intersection Summary			
HCM Average Control Delay	86.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	129.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.97	1.00
Satd. Flow (prot)	1863	5353	1630	1863	5178		1770	1856	1667	1770	1814	1657
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1863	5353	1630	1863	5178		1770	1856	1667	1770	1814	1657
Volume (vph)	210	2419	1057	322	688	159	206	187	517	203	63	266
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	226	2601	1137	374	800	185	248	225	623	245	76	320
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	9	0	0	116
Lane Group Flow (vph)	226	2601	1137	374	967	0	231	242	614	156	165	204
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)			5			3						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	23.3	75.6	156.2	18.6	70.9		25.2	25.2	43.8	17.3	17.3	40.6
Effective Green, g (s)	22.8	77.1	156.2	18.1	72.4		26.2	26.2	45.3	16.8	16.8	39.6
Actuated g/C Ratio	0.15	0.49	1.00	0.12	0.46		0.17	0.17	0.29	0.11	0.11	0.25
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	272	2642	1630	216	2400		297	311	526	190	195	420
v/s Ratio Prot	0.12	c0.49		c0.20	0.19		0.13	0.13	c0.14	0.09	0.09	0.07
v/s Ratio Perm			c0.70						0.23			0.05
v/c Ratio	0.83	0.98	0.70	1.73	0.40		0.78	0.78	1.17	0.82	0.85	0.48
Uniform Delay, d1	64.8	39.0	0.0	69.0	27.6		62.2	62.2	55.4	68.2	68.4	49.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.0	14.2	2.5	347.8	0.3		11.6	11.2	94.7	25.8	28.9	0.9
Delay (s)	83.8	53.2	2.5	416.9	28.0		73.8	73.4	150.1	94.0	97.4	50.5
Level of Service	F	D	A	F	C		E	E	F	F	F	D
Approach Delay (s)		40.4			135.0			117.1			73.2	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM Average Control Delay	73.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	156.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	93.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3614	5199		1863	5353	1667	1863	3725	1652	1863	3725	1656
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5199		1863	5353	1667	1863	3725	1652	1863	3725	1656
Volume (vph)	686	2039	420	74	767	194	118	496	64	192	481	138
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	780	2317	477	82	852	216	126	528	68	211	529	152
RTOR Reduction (vph)	0	19	0	0	0	49	0	0	8	0	0	27
Lane Group Flow (vph)	780	2775	0	82	852	167	126	528	60	211	529	125
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	32.1	57.5		9.5	34.9	54.0	12.4	23.9	33.4	14.1	25.6	57.7
Effective Green, g (s)	33.1	58.5		10.5	35.9	54.0	12.4	25.9	36.4	14.1	27.6	60.7
Actuated g/C Ratio	0.26	0.47		0.08	0.29	0.43	0.10	0.21	0.29	0.11	0.22	0.49
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	957	2433		156	1537	720	185	772	534	210	822	857
v/s Ratio Prot	c0.22	c0.53		0.04	0.16	0.10	0.07	0.14	0.01	c0.11	c0.14	0.04
v/s Ratio Perm									0.03			0.04
v/c Ratio	0.82	1.14		0.53	0.55	0.23	0.68	0.68	0.11	1.00	0.64	0.15
Uniform Delay, d1	43.1	33.2		54.9	37.8	22.4	54.4	45.8	32.5	55.5	44.2	17.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	68.8		4.1	0.9	0.5	10.7	2.7	0.1	63.3	2.8	0.2
Delay (s)	49.2	102.1		59.0	38.7	22.9	65.1	48.5	32.6	118.8	47.1	18.0
Level of Service	D	F		E	D	C	E	D	C	F	D	B
Approach Delay (s)		90.5			37.2			49.9			59.1	
Approach LOS		F			D			D			E	

Intersection Summary			
HCM Average Control Delay	71.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	282	2081	15	69	902	386	11	333	67	471	251	223
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.94	0.94	0.94
Adj. Flow (vph)	317	2338	17	76	991	424	13	387	78	501	267	237
RTOR Reduction (vph)	0	0	0	0	0	30	0	0	9	0	0	92
Lane Group Flow (vph)	317	2355	0	76	991	394	13	387	69	501	267	145
Confl. Peds. (#/hr)	2		12	12		2	6		8	8		6
Confl. Bikes (#/hr)			3			1			1			1
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	31.7	90.3		9.9	68.5	105.2	4.0	22.6	37.5	31.7	48.8	85.5
Effective Green, g (s)	31.2	91.3		10.4	69.5	106.7	8.0	23.6	38.0	35.7	49.8	86.0
Actuated g/C Ratio	0.18	0.52		0.06	0.40	0.61	0.05	0.14	0.22	0.20	0.29	0.49
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	333	2797		111	2132	1019	85	504	363	381	1063	822
v/s Ratio Prot	c0.17	c0.44		0.04	0.19	0.24	0.01	c0.10	0.04	c0.27	0.07	0.09
v/s Ratio Perm												
v/c Ratio	0.95	0.84		0.68	0.46	0.39	0.15	0.77	0.19	1.31	0.25	0.18
Uniform Delay, d1	70.9	35.4		80.4	38.8	17.2	80.0	72.8	55.7	69.4	48.0	24.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.6	3.3		16.1	0.7	0.7	1.1	7.7	0.4	159.3	0.3	0.2
Delay (s)	107.5	38.7		96.5	39.5	17.9	81.1	80.5	56.2	228.7	48.3	24.8
Level of Service	F	D		F	D	B	F	F	E	F	D	C
Approach Delay (s)		46.9			36.3			76.6			132.7	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	174.5	Sum of lost time (s)	10.5
Intersection Capacity Utilization	90.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.99	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	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3614	5353	1608	1863	5353	1643	1863	3526		3614	1961	1638
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3614	5353	1608	1863	5353	1643	1863	3526		3614	1961	1638
Volume (vph)	332	2116	68	13	996	253	35	47	26	270	55	174
Peak-hour factor, PHF	0.91	0.91	0.91	0.97	0.97	0.97	0.67	0.67	0.67	0.84	0.84	0.84
Adj. Flow (vph)	365	2325	75	13	1027	261	52	70	39	321	65	207
RTOR Reduction (vph)	0	0	15	0	0	125	0	35	0	0	0	172
Lane Group Flow (vph)	365	2325	60	13	1027	136	52	74	0	321	65	35
Confl. Peds. (#/hr)	1		4	4		1	4					4
Confl. Bikes (#/hr)			6			1						1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	16.2	80.2	80.2	2.8	66.8	66.8	7.2	14.4		14.6	22.3	22.3
Effective Green, g (s)	16.2	81.2	81.2	2.8	67.8	67.8	6.7	13.9		15.6	21.8	21.8
Actuated g/C Ratio	0.12	0.62	0.62	0.02	0.52	0.52	0.05	0.11		0.12	0.17	0.17
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5		5.0	4.5	4.5
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	449	3331	1001	40	2781	854	96	376		432	328	274
v/s Ratio Prot	c0.10	c0.43		0.01	0.19		0.03	0.02		c0.09	c0.03	
v/s Ratio Perm			0.04			0.08						0.02
v/c Ratio	0.81	0.70	0.06	0.33	0.37	0.16	0.54	0.20		0.74	0.20	0.13
Uniform Delay, d1	55.7	16.5	9.7	62.9	18.6	16.4	60.4	53.2		55.5	46.8	46.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.8	1.2	0.1	4.7	0.4	0.4	6.1	0.3		6.8	0.3	0.2
Delay (s)	66.4	17.7	9.8	67.6	19.0	16.8	66.5	53.5		62.3	47.1	46.5
Level of Service	E	B	A	E	B	B	E	D		E	D	D
Approach Delay (s)		23.9			19.1			57.7			55.1	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	365	2325	75	13	1027	261	52	109	321	65	207
v/c Ratio	0.79	0.68	0.07	0.14	0.37	0.27	0.45	0.28	0.72	0.19	0.46
Control Delay	67.9	19.5	8.1	67.2	20.8	3.4	73.0	33.8	64.8	46.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	19.5	8.1	67.2	20.8	3.4	73.0	33.8	64.8	46.7	8.7
Queue Length 50th (ft)	143	316	7	10	162	0	40	27	124	47	0
Queue Length 95th (ft)	#306	895	51	37	322	56	74	35	#223	81	46
Internal Link Dist (ft)		928			806			508		222	
Turn Bay Length (ft)	255		260	230		230	175				
Base Capacity (vph)	460	3420	1038	150	2747	970	143	1008	458	623	661
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.68	0.07	0.09	0.37	0.27	0.36	0.11	0.70	0.10	0.31

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5343		1863	5353	1632	1863	1702		3614	1961	1631
Volume (vph)	75	2389	24	30	1058	470	10	2	10	317	9	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.55	0.55	0.55	0.75	0.75	0.75
Adj. Flow (vph)	81	2569	26	33	1150	511	18	4	18	423	12	67
RTOR Reduction (vph)	0	0	0	0	0	245	0	17	0	0	0	53
Lane Group Flow (vph)	81	2595	0	33	1150	266	18	5	0	423	12	14
Confl. Peds. (#/hr)			1	1			14		1	1		14
Confl. Bikes (#/hr)			8			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.5	48.5		2.5	44.5	44.5	2.3	7.1		12.8	18.1	18.1
Effective Green, g (s)	7.0	49.5		3.0	45.5	45.5	2.8	7.1		13.8	18.1	18.1
Actuated g/C Ratio	0.08	0.55		0.03	0.51	0.51	0.03	0.08		0.15	0.20	0.20
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	146	2958		63	2724	831	58	135		558	397	330
v/s Ratio Prot	c0.04	c0.49		0.02	0.21		0.01	0.00		c0.12	0.01	
v/s Ratio Perm						0.16						c0.01
v/c Ratio	0.55	0.88		0.52	0.42	0.32	0.31	0.04		0.76	0.03	0.04
Uniform Delay, d1	39.7	17.3		42.5	13.7	12.9	42.4	38.0		36.2	28.6	28.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	3.5		3.6	0.2	0.4	2.2	0.1		5.6	0.0	0.0
Delay (s)	42.3	20.8		46.1	13.9	13.3	44.6	38.1		41.8	28.6	28.7
Level of Service	D	C		D	B	B	D	D		D	C	C
Approach Delay (s)		21.4			14.3			41.0			39.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	471	3128	58	1758	179	673	726
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	512	3400	63	1911	195	732	789
RTOR Reduction (vph)	0	0	0	0	28	0	0
Lane Group Flow (vph)	512	3400	63	1911	167	732	789
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	32.3	122.2	11.8	101.7	101.7	41.4	190.0
Effective Green, g (s)	32.3	123.5	11.8	103.0	103.0	42.7	190.0
Actuated g/C Ratio	0.17	0.65	0.06	0.54	0.54	0.22	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	614	4384	116	3657	904	812	1667
v/s Ratio Prot	c0.14	c0.50	0.03	0.28		c0.20	
v/s Ratio Perm					0.10		0.47
v/c Ratio	0.83	0.78	0.54	0.52	0.18	0.90	0.47
Uniform Delay, d1	76.3	23.5	86.5	27.8	22.1	71.6	0.0
Progression Factor	1.27	0.56	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1	5.1	0.5	0.4	13.1	1.0
Delay (s)	97.5	13.2	91.6	28.3	22.6	84.7	1.0
Level of Service	F	B	F	C	C	F	A
Approach Delay (s)		24.2		29.6		41.3	
Approach LOS		C		C		D	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Volume (vph)	254	2585	335	339	1269	632	195	646	356	1073	1719	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	2810	364	368	1379	687	212	702	387	1166	1868	98
RTOR Reduction (vph)	0	0	0	0	0	319	0	0	89	0	3	0
Lane Group Flow (vph)	276	2810	364	368	1379	368	212	702	298	1166	1963	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	19.8	56.7	190.0	20.8	57.7	57.7	9.5	41.7	41.7	48.5	81.7	
Effective Green, g (s)	21.3	58.0	190.0	22.3	59.0	59.0	11.0	42.7	42.7	51.0	82.7	
Actuated g/C Ratio	0.11	0.31	1.00	0.12	0.31	0.31	0.06	0.22	0.22	0.27	0.44	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	6.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	405	2059	1667	424	2095	518	209	837	375	970	2313	
v/s Ratio Prot	0.08	c0.42		c0.10	0.20		0.06	0.19		c0.32	c0.37	
v/s Ratio Perm			c0.22			0.22			0.18			
v/c Ratio	0.68	1.36	0.22	0.87	0.66	0.71	1.01	0.84	0.79	1.20	0.85	
Uniform Delay, d1	81.1	66.0	0.0	82.4	56.8	58.0	89.5	70.4	69.5	69.5	48.0	
Progression Factor	1.33	0.47	1.00	1.05	1.47	2.53	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	165.8	0.2	15.1	1.4	7.1	66.0	7.7	11.6	100.9	3.2	
Delay (s)	110.0	196.6	0.2	101.3	85.0	153.8	155.5	78.1	81.1	170.4	51.3	
Level of Service	F	F	A	F	F	F	F	E	F	F	D	
Approach Delay (s)		169.0			106.9			91.6			95.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	122.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.2%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	12	2863	1635	244	1406	14	1036	99	182	14	129	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	3112	1777	265	1528	15	1126	108	198	15	140	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	136	0	0	0
Lane Group Flow (vph)	13	3112	1777	265	1528	15	1126	108	62	15	140	59
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	3.2	95.6	190.0	16.0	108.4	190.0	46.4	46.4	46.4	12.0	12.0	190.0
Effective Green, g (s)	4.2	96.6	190.0	17.0	109.4	190.0	47.4	47.4	47.4	13.0	13.0	190.0
Actuated g/C Ratio	0.02	0.51	1.00	0.09	0.58	1.00	0.25	0.25	0.25	0.07	0.07	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	41	3429	1667	167	3884	1667	902	489	416	247	134	1667
v/s Ratio Prot	0.01	0.46		c0.14	0.23		c0.31	0.06		0.00	0.07	
v/s Ratio Perm			c1.07			0.01			0.04			0.04
v/c Ratio	0.32	0.91	1.07	1.59	0.39	0.01	1.25	0.22	0.15	0.06	1.04	0.04
Uniform Delay, d1	91.5	42.6	95.0	86.5	22.1	0.0	71.3	56.6	55.6	82.8	88.5	0.0
Progression Factor	1.00	1.00	1.00	0.68	2.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	4.6	42.0	284.0	0.2	0.0	121.0	0.3	0.2	0.1	90.2	0.0
Delay (s)	97.5	47.3	137.0	342.8	66.0	0.0	192.3	56.9	55.8	82.9	178.7	0.0
Level of Service	F	D	F	F	E	A	F	E	E	F	F	A
Approach Delay (s)		79.9			106.0			163.2			122.7	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	101.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	3112	1777	265	1528	15	1126	108	198	15	140	59
v/c Ratio	0.15	0.91	1.07	1.59	0.38	0.01	1.25	0.22	0.36	0.06	1.04	0.04
Control Delay	90.8	47.3	46.3	321.3	62.2	0.0	175.7	59.0	11.3	83.5	170.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.8	47.3	46.3	321.3	62.2	0.0	175.7	59.0	11.3	83.5	170.1	0.0
Queue Length 50th (ft)	16	991	~284	~477	537	0	~929	110	17	9	~188	0
Queue Length 95th (ft)	43	1020	#527	m#657	m577	m0	#1067	173	92	24	#351	0
Internal Link Dist (ft)		690			684			107			258	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	88	3515	1667	167	3989	1667	902	489	552	247	134	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.89	1.07	1.59	0.38	0.01	1.25	0.22	0.36	0.06	1.04	0.04

Intersection Summary

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Appendix G – Level of Service Worksheets: 2030 plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1500	1583
Volume (vph)	0	400	303	507	3451	0	0	0	0	187	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	444	337	545	3711	0	0	0	0	210	4	606
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	444	129	545	3711	0	0	0	0	210	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		49.3	49.3	41.1	94.9					27.6	27.6	27.6
Effective Green, g (s)		50.8	50.8	40.6	96.4					28.6	28.6	28.6
Actuated g/C Ratio		0.38	0.38	0.31	0.72					0.22	0.22	0.22
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2045	637	569	3880					381	323	340
v/s Ratio Prot		0.08	0.08	0.29	c0.69					0.12	c0.20	0.19
v/s Ratio Perm												
v/c Ratio		0.22	0.20	0.96	0.96					0.55	0.95	0.89
Uniform Delay, d1		27.7	27.5	45.4	16.4					46.5	51.5	50.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.4	27.2	7.2					1.7	36.1	23.3
Delay (s)		27.8	28.0	72.5	23.6					48.2	87.6	74.0
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		27.9			29.9			0.0			72.5	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	0.88	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5353	2869	1863	5353					1770	1500	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5353	2869	1863	5353					1770	1500	1583
Volume (vph)	0	400	303	507	3451	0	0	0	0	187	4	539
Peak-hour factor, PHF	0.90	0.90	0.90	0.93	0.93	0.93	0.25	0.25	0.25	0.89	0.89	0.89
Adj. Flow (vph)	0	444	337	545	3711	0	0	0	0	210	4	606
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	1	1
Lane Group Flow (vph)	0	444	129	545	3711	0	0	0	0	210	306	302
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			2			8						
Turn Type			Perm	Prot						Split		Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			2									
Actuated Green, G (s)		49.3	49.3	41.1	94.9					27.6	27.6	27.6
Effective Green, g (s)		50.8	50.8	40.6	96.4					28.6	28.6	28.6
Actuated g/C Ratio		0.38	0.38	0.31	0.72					0.22	0.22	0.22
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2045	1096	569	3880					381	323	340
v/s Ratio Prot		0.08		0.29	c0.69					0.12	c0.20	0.19
v/s Ratio Perm			0.04									
v/c Ratio		0.22	0.12	0.96	0.96					0.55	0.95	0.89
Uniform Delay, d1		27.7	26.6	45.4	16.4					46.5	51.5	50.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	27.2	7.2					1.7	36.1	23.3
Delay (s)		27.8	26.7	72.5	23.6					48.2	87.6	74.0
Level of Service		C	C	E	C					D	F	E
Approach Delay (s)		27.4			29.9			0.0			72.5	
Approach LOS		C			C			A			E	

Intersection Summary			
HCM Average Control Delay	35.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	133.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.99		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	0.96	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1863	5353	1632	1863	5296		1770	1791	1667	1770	1843	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (perm)	1863	5353	1632	1863	5296		1770	1791	1667	1770	1843	1667
Volume (vph)	95	354	132	218	2394	156	1539	174	154	90	60	225
Peak-hour factor, PHF	0.83	0.83	0.83	0.96	0.96	0.96	0.96	0.96	0.96	0.70	0.70	0.70
Adj. Flow (vph)	114	427	159	227	2494	162	1603	181	160	129	86	321
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	43	0	0	2
Lane Group Flow (vph)	114	427	159	227	2652	0	869	915	117	105	110	319
Confl. Bikes (#/hr)			2			5						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	10.5	46.6	170.2	24.9	61.0		65.0	65.0	89.9	14.2	14.2	24.7
Effective Green, g (s)	10.0	48.1	170.2	24.4	62.5		66.0	66.0	91.4	13.7	13.7	23.7
Actuated g/C Ratio	0.06	0.28	1.00	0.14	0.37		0.39	0.39	0.54	0.08	0.08	0.14
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	109	1513	1632	267	1945		686	695	934	142	148	232
v/s Ratio Prot	0.06	0.08		0.12	c0.50		0.49	c0.51	0.02	0.06	0.06	c0.08
v/s Ratio Perm			0.10						0.05			0.11
v/c Ratio	1.05	0.28	0.10	0.85	1.36		1.27	1.32	0.13	0.74	0.74	1.38
Uniform Delay, d1	80.1	47.6	0.0	71.1	53.8		52.1	52.1	19.6	76.5	76.5	73.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.1	0.5	0.1	21.9	167.0		131.4	152.5	0.1	20.3	20.3	194.1
Delay (s)	179.2	48.1	0.1	93.1	220.9		183.5	204.6	19.6	96.8	96.8	267.3
Level of Service	F	D	A	F	F		F	F	B	F	F	F
Approach Delay (s)		58.5			210.8			180.0			198.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	182.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	170.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	116.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.99	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	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3614	5147		1863	5353	1667	1863	3725	1648	1863	3725	1651
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5147		1863	5353	1667	1863	3725	1648	1863	3725	1651
Volume (vph)	111	518	149	43	1896	90	457	387	82	143	652	776
Peak-hour factor, PHF	0.85	0.85	0.85	0.95	0.95	0.95	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	131	609	175	45	1996	95	544	461	98	155	709	843
RTOR Reduction (vph)	0	33	0	0	0	27	0	0	59	0	0	3
Lane Group Flow (vph)	131	751	0	45	1996	68	544	461	39	155	709	840
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	10.0	46.4		8.8	45.2	66.4	26.1	41.0	49.8	16.2	31.1	41.1
Effective Green, g (s)	11.0	47.4		9.8	46.2	66.4	26.1	43.0	52.8	16.2	33.1	44.1
Actuated g/C Ratio	0.08	0.36		0.07	0.35	0.50	0.20	0.32	0.40	0.12	0.25	0.33
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	300	1843		138	1868	836	367	1210	707	228	931	600
v/s Ratio Prot	0.04	0.15		0.02	c0.37	0.04	c0.29	0.12	0.00	0.08	0.19	c0.12
v/s Ratio Perm									0.02			0.39
v/c Ratio	0.44	0.41		0.33	1.07	0.08	1.48	0.38	0.06	0.68	0.76	1.40
Uniform Delay, d1	57.8	31.9		58.2	43.1	17.2	53.2	34.4	24.5	55.6	46.0	44.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.4		1.9	41.9	0.1	231.2	0.3	0.0	8.5	4.8	189.7
Delay (s)	59.9	32.4		60.0	85.0	17.3	284.3	34.7	24.5	64.1	50.8	233.9
Level of Service	E	C		E	F	B	F	C	C	E	D	F
Approach Delay (s)		36.3			81.5			156.9			142.4	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	106.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	132.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5353	1629	1863	5353	1667	3614	3725	1648	1863	3725	2905
Flt Permitted	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 (perm)	3614	5353	1629	1863	5353	1667	3614	3725	1648	1863	3725	2905
Volume (vph)	111	518	149	43	1896	90	457	387	82	143	652	776
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	563	162	45	1996	95	497	421	89	155	709	843
RTOR Reduction (vph)	0	0	85	0	0	26	0	0	57	0	0	9
Lane Group Flow (vph)	121	563	77	45	1996	69	497	421	32	155	709	834
Confl. Peds. (#/hr)			6	6			1		1	1		1
Confl. Bikes (#/hr)			1			6			1			
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	10.1	49.4	49.4	7.3	46.6	67.5	22.4	36.7	44.0	15.9	30.2	40.3
Effective Green, g (s)	11.1	50.4	50.4	8.3	47.6	67.5	22.4	38.7	47.0	15.9	32.2	43.3
Actuated g/C Ratio	0.09	0.39	0.39	0.06	0.37	0.52	0.17	0.30	0.36	0.12	0.25	0.33
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0	6.0	4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	310	2087	635	120	1971	870	626	1115	650	229	928	1063
v/s Ratio Prot	0.03	c0.11		0.02	c0.37	0.04	c0.14	0.11	0.00	0.08	0.19	c0.07
v/s Ratio Perm			0.05						0.02			0.22
v/c Ratio	0.39	0.27	0.12	0.38	1.01	0.08	0.79	0.38	0.05	0.68	0.76	0.78
Uniform Delay, d1	55.9	26.9	25.3	58.0	40.9	15.4	51.2	35.8	26.7	54.2	45.0	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.2	0.2	2.7	23.5	0.1	7.3	0.3	0.0	8.4	4.9	4.5
Delay (s)	57.6	27.1	25.5	60.7	64.3	15.5	58.5	36.1	26.7	62.6	49.9	43.3
Level of Service	E	C	C	E	E	B	E	D	C	E	D	D
Approach Delay (s)		31.2			62.1			46.3			47.8	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	50.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	129.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5347		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	106	685	5	107	2046	157	20	188	61	202	362	173
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.77	0.77	0.77	0.73	0.73	0.73
Adj. Flow (vph)	118	761	6	116	2224	171	26	244	79	277	496	237
RTOR Reduction (vph)	0	0	0	0	0	22	0	0	42	0	0	55
Lane Group Flow (vph)	118	767	0	116	2224	149	26	244	37	277	496	182
Confl. Peds. (#/hr)	6					6	8					8
Confl. Bikes (#/hr)						7			2			
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	14.3	81.6		14.7	82.0	113.8	6.0	16.5	36.2	26.8	35.8	55.1
Effective Green, g (s)	13.8	82.6		15.2	83.0	115.3	10.0	17.5	36.7	30.8	36.8	55.6
Actuated g/C Ratio	0.09	0.52		0.10	0.52	0.72	0.06	0.11	0.23	0.19	0.23	0.35
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	161	2767		177	2784	1204	117	408	383	360	859	581
v/s Ratio Prot	c0.06	0.14		0.06	c0.42	0.09	0.01	0.07	0.02	c0.15	c0.13	0.11
v/s Ratio Perm												
v/c Ratio	0.73	0.28		0.66	0.80	0.12	0.22	0.60	0.10	0.77	0.58	0.31
Uniform Delay, d1	71.1	21.7		69.7	31.4	6.8	71.1	67.7	48.4	61.0	54.5	38.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.8	0.2		8.4	2.5	0.1	1.3	3.1	0.2	12.1	1.5	0.6
Delay (s)	86.9	21.9		78.1	33.9	6.9	72.4	70.8	48.6	73.2	56.0	38.7
Level of Service	F	C		E	C	A	E	E	D	E	E	D
Approach Delay (s)		30.6			34.1			65.9			56.6	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	159.6	Sum of lost time (s)	6.5
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	5.0	5.0	4.0	4.0	5.0
Lane Util. Factor	0.97	0.91	1.00		1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	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
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	5353	1613		1863	5353	1633	1863	1961	1644	3614	1961
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	5353	1613		1863	5353	1633	1863	1961	1644	3614	1961
Volume (vph)	157	714	105	22	48	2027	149	183	14	105	91	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.88	0.88	0.88	0.83	0.83
Adj. Flow (vph)	171	776	114	24	51	2156	159	208	16	119	110	48
RTOR Reduction (vph)	0	0	47	0	0	0	37	0	0	101	0	0
Lane Group Flow (vph)	171	776	67	0	75	2156	122	208	16	18	110	48
Confl. Peds. (#/hr)	5		4		4		5	3		2	2	
Confl. Bikes (#/hr)			1				3					
Turn Type	Prot		Perm	Prot	Prot		Perm	Prot		Perm	Prot	
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2				6			8		
Actuated Green, G (s)	10.2	74.8	74.8		8.6	73.2	73.2	14.7	18.6	18.6	9.1	13.5
Effective Green, g (s)	10.2	75.8	75.8		8.6	74.2	74.2	14.2	18.1	19.1	10.1	13.0
Actuated g/C Ratio	0.08	0.58	0.58		0.07	0.57	0.57	0.11	0.14	0.15	0.08	0.10
Clearance Time (s)	4.0	5.0	5.0		4.0	5.0	5.0	4.5	4.5	4.5	5.0	4.5
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	284	3131	943		124	3065	935	204	274	242	282	197
v/s Ratio Prot	c0.05	0.14			0.04	c0.40		c0.11	0.01		0.03	c0.02
v/s Ratio Perm			0.04				0.07			0.01		
v/c Ratio	0.60	0.25	0.07		0.60	0.70	0.13	1.02	0.06	0.07	0.39	0.24
Uniform Delay, d1	57.7	13.1	11.6		58.8	19.8	12.8	57.7	48.4	47.6	56.8	53.8
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	0.2	0.1		8.1	1.4	0.3	68.2	0.1	0.1	0.9	0.6
Delay (s)	61.3	13.2	11.8		66.9	21.2	13.1	125.9	48.4	47.7	57.7	54.4
Level of Service	E	B	B		E	C	B	F	D	D	E	D
Approach Delay (s)		20.8				22.1			95.2			55.3
Approach LOS		C				C			F			E

Intersection Summary			
HCM Average Control Delay	30.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	129.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	2000
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1642
Flt Permitted	1.00
Satd. Flow (perm)	1642
Volume (vph)	75
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	90
RTOR Reduction (vph)	81
Lane Group Flow (vph)	9
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	13.5
Effective Green, g (s)	13.0
Actuated g/C Ratio	0.10
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	165
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.05
Uniform Delay, d1	52.7
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	52.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	UL	T	T	T	R	L
Maximum Queue (ft)	141	158	141	175	204	58	177	241	238	231	178	330
Average Queue (ft)	60	75	68	88	113	18	75	217	217	215	53	191
95th Queue (ft)	114	126	126	155	181	43	146	271	261	257	153	343
Link Distance (ft)			220	220	220	220		186	186	186		349
Upstream Blk Time (%)					0		0	18	20	20	0	3
Queuing Penalty (veh)					0		0	138	148	151	0	4
Storage Bay Dist (ft)	255	255					370				230	
Storage Blk Time (%)							0	18		20	0	
Queuing Penalty (veh)							0	13		30	1	

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	L	T	R
Maximum Queue (ft)	61	68	86	93	79	114
Average Queue (ft)	11	27	29	36	24	30
95th Queue (ft)	36	51	63	72	60	76
Link Distance (ft)	349	349	217	217	217	217
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	776	114	75	2156	159	208	16	119	110	48	90
v/c Ratio	0.60	0.25	0.11	0.52	0.71	0.16	1.01	0.06	0.35	0.39	0.24	0.37
Control Delay	68.4	15.4	3.8	73.2	23.7	8.2	123.6	46.1	10.0	63.1	54.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	15.4	3.8	73.2	23.9	8.2	123.6	46.1	10.0	63.1	54.0	13.3
Queue Length 50th (ft)	68	102	0	58	412	24	168	12	0	43	37	0
Queue Length 95th (ft)	132	220	37	133	787	88	#425	31	46	84	68	37
Internal Link Dist (ft)		232			214			412			222	
Turn Bay Length (ft)	255			370		230						
Base Capacity (vph)	310	3149	992	607	3046	965	205	575	576	310	521	502
Starvation Cap Reductn	0	0	0	0	234	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.25	0.11	0.12	0.77	0.16	1.01	0.03	0.21	0.35	0.09	0.18

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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
Frt	1.00	1.00		1.00	1.00	0.85	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		0.95	1.00	1.00
Satd. Flow (prot)	1863	5330		1863	5353	1629	1863	1667		3614	1961	1641
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5330		1863	5353	1629	1863	1667		3614	1961	1641
Volume (vph)	46	902	23	20	2161	176	9	0	14	77	4	28
Peak-hour factor, PHF	0.89	0.89	0.89	0.90	0.90	0.90	0.67	0.67	0.67	0.65	0.65	0.65
Adj. Flow (vph)	52	1013	26	22	2401	196	13	0	21	118	6	43
RTOR Reduction (vph)	0	1	0	0	0	37	0	19	0	0	0	37
Lane Group Flow (vph)	52	1038	0	22	2401	159	13	2	0	118	6	6
Confl. Peds. (#/hr)							5					5
Confl. Bikes (#/hr)			1			4						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	4.2	55.1		2.2	53.1	53.1	0.9	7.4		6.0	13.0	13.0
Effective Green, g (s)	4.7	56.1		2.7	54.1	54.1	1.4	7.4		7.0	13.0	13.0
Actuated g/C Ratio	0.05	0.63		0.03	0.61	0.61	0.02	0.08		0.08	0.15	0.15
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	98	3352		56	3247	988	29	138		284	286	239
v/s Ratio Prot	c0.03	0.19		0.01	c0.45		0.01	0.00		c0.03	0.00	
v/s Ratio Perm						0.10						c0.00
v/c Ratio	0.53	0.31		0.39	0.74	0.16	0.45	0.01		0.42	0.02	0.03
Uniform Delay, d1	41.2	7.6		42.4	12.5	7.7	43.5	37.5		39.2	32.6	32.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		1.7	1.0	0.1	7.8	0.0		0.7	0.0	0.0
Delay (s)	43.9	7.7		44.1	13.6	7.8	51.3	37.6		39.9	32.7	32.7
Level of Service	D	A		D	B	A	D	D		D	C	C
Approach Delay (s)		9.4			13.4			42.8			37.8	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	502	1097	11	4159	750	85	545
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	546	1192	12	4521	815	92	592
RTOR Reduction (vph)	0	0	0	0	59	0	0
Lane Group Flow (vph)	546	1192	12	4521	756	92	592
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	43.5	157.6	3.3	117.4	117.4	14.5	190.0
Effective Green, g (s)	43.5	158.9	3.3	118.7	118.7	15.8	190.0
Actuated g/C Ratio	0.23	0.84	0.02	0.62	0.62	0.08	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	827	5641	32	4214	1041	301	1667
v/s Ratio Prot	c0.15	0.18	0.01	c0.67		0.03	
v/s Ratio Perm					0.45		c0.36
v/c Ratio	0.66	0.21	0.38	1.07	0.73	0.31	0.36
Uniform Delay, d1	66.5	3.1	92.3	35.6	24.5	81.9	0.0
Progression Factor	0.56	2.48	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.0	7.2	38.2	4.4	0.6	0.6
Delay (s)	38.5	7.7	99.6	73.8	28.9	82.5	0.6
Level of Service	D	A	F	E	C	F	A
Approach Delay (s)		17.4		67.0		11.6	
Approach LOS		B		E		B	

Intersection Summary			
HCM Average Control Delay	51.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5258	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5258	
Volume (vph)	166	918	27	54	2526	1370	713	791	54	580	246	33
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	998	29	59	2746	1489	775	860	59	630	267	36
RTOR Reduction (vph)	0	0	0	0	0	139	0	0	44	0	10	0
Lane Group Flow (vph)	180	998	29	59	2746	1350	775	860	15	630	293	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	11.1	94.9	190.0	8.7	92.5	92.5	27.5	47.6	47.6	17.5	37.6	
Effective Green, g (s)	12.6	96.2	190.0	10.2	93.8	93.8	29.0	48.6	48.6	19.0	38.6	
Actuated g/C Ratio	0.07	0.51	1.00	0.05	0.49	0.49	0.15	0.26	0.26	0.10	0.20	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	240	3415	1667	194	3330	823	552	953	426	361	1068	
v/s Ratio Prot	c0.05	0.15		0.02	0.41		c0.21	c0.23		c0.17	0.06	
v/s Ratio Perm			c0.02			c0.81			0.01			
v/c Ratio	0.75	0.29	0.02	0.30	0.82	1.64	1.40	0.90	0.04	1.75	0.27	
Uniform Delay, d1	87.2	27.2	0.0	86.5	41.1	48.1	80.5	68.4	53.1	85.5	63.9	
Progression Factor	1.23	0.47	1.00	1.33	0.48	0.31	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.0	0.2	0.0	0.2	0.6	289.4	192.5	11.8	0.0	346.6	0.2	
Delay (s)	117.9	12.9	0.0	115.5	20.3	304.4	273.0	80.2	53.1	432.1	64.1	
Level of Service	F	B	A	F	C	F	F	F	D	F	E	
Approach Delay (s)		28.2			120.1			167.5			312.6	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	138.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	118.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	88	1281	1153	164	3081	52	1293	49	178	33	80	143
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	1392	1253	178	3349	57	1405	53	193	36	87	155
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	124	0	0	0
Lane Group Flow (vph)	96	1392	1253	178	3349	57	1405	53	69	36	87	155
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	9.0	71.9	190.0	23.8	86.7	190.0	67.0	67.0	67.0	8.0	8.0	190.0
Effective Green, g (s)	9.0	73.2	190.0	23.8	88.0	190.0	68.0	68.0	68.0	9.0	9.0	190.0
Actuated g/C Ratio	0.05	0.39	1.00	0.13	0.46	1.00	0.36	0.36	0.36	0.05	0.05	1.00
Clearance Time (s)	4.0	5.3		4.0	5.3		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	88	2599	1667	233	3124	1667	1293	702	597	171	93	1667
v/s Ratio Prot	c0.05	0.21		0.10	c0.50		c0.39	0.03		0.01	0.04	
v/s Ratio Perm			c0.75			0.03			0.04			0.09
v/c Ratio	1.09	0.54	0.75	0.76	1.07	0.03	1.09	0.08	0.12	0.21	0.94	0.09
Uniform Delay, d1	90.5	45.2	0.0	80.4	51.0	0.0	61.0	40.3	40.9	87.1	90.2	0.0
Progression Factor	1.00	1.00	1.00	0.98	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	122.7	0.8	3.2	5.5	35.1	0.0	52.1	0.1	0.1	0.8	72.4	0.1
Delay (s)	213.2	46.0	3.2	84.6	90.5	0.0	113.1	40.3	41.0	87.9	162.6	0.1
Level of Service	F	D	A	F	F	A	F	D	D	F	F	A
Approach Delay (s)		32.3			88.7			102.3			62.3	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM Average Control Delay	71.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	96	1392	1253	178	3349	57	1405	53	193	36	87	155
v/c Ratio	1.09	0.54	0.75	0.76	1.07	0.03	1.09	0.08	0.27	0.21	0.94	0.09
Control Delay	199.5	46.6	3.2	86.7	86.8	0.0	107.7	40.8	5.6	90.2	162.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.5	46.6	3.2	86.7	86.8	0.0	107.7	40.8	5.6	90.2	162.7	0.1
Queue Length 50th (ft)	~134	395	0	234	~1319	0	~1009	44	0	22	111	0
Queue Length 95th (ft)	#271	445	0	m257	m#1046	m0	#1144	80	59	45	#239	0
Internal Link Dist (ft)		670			841			82			906	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	88	2600	1667	275	3124	1667	1293	702	721	171	93	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.54	0.75	0.65	1.07	0.03	1.09	0.08	0.27	0.21	0.94	0.09

Intersection Summary

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	151	0	59	30	0	66	27	85	0	0	123	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	0	64	33	0	72	29	92	0	0	134	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											492	
pX, platoon unblocked	1.00	1.00	1.00	1.00	1.00		1.00					
vC, conflicting volume	395	323	172	387	361	92	210			92		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	394	322	171	386	360	92	209			92		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	100	93	94	100	93	98			100		
cM capacity (veh/h)	514	582	872	521	554	965	1360			1502		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	228	33	72	29	92	210
Volume Left	164	33	0	29	0	0
Volume Right	64	0	72	0	0	76
cSH	581	521	965	1360	1700	1700
Volume to Capacity	0.39	0.06	0.07	0.02	0.05	0.12
Queue Length 95th (ft)	47	5	6	2	0	0
Control Delay (s)	15.1	12.4	9.0	7.7	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	15.1	10.1		1.9		0.0
Approach LOS	C	B				

Intersection Summary			
Average Delay	7.1		
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												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	39	0	57	26	0	11	15	62	18	23	179	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	0	62	28	0	12	16	67	20	25	195	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								986			1161	
pX, platoon unblocked												
vC, conflicting volume	372	370	200	422	365	77	205			87		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	372	370	200	422	365	77	205			87		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	93	94	100	99	99			98		
cM capacity (veh/h)	565	544	841	491	547	984	1366			1509		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	104	40	103	230
Volume Left	42	28	16	25
Volume Right	62	12	20	11
cSH	702	577	1366	1509
Volume to Capacity	0.15	0.07	0.01	0.02
Queue Length 95th (ft)	13	6	1	1
Control Delay (s)	11.0	11.7	1.3	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.0	11.7	1.3	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	969	8	0	2285	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1053	9	0	2484	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	723			312		
pX, platoon unblocked			0.93		0.74	0.93
vC, conflicting volume			1062		1886	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			913		1057	153
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			689		163	804

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	421	421	219	828	828	828	8
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	8
cSH	1700	1700	1700	1700	1700	1700	804
Volume to Capacity	0.25	0.25	0.13	0.49	0.49	0.49	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.5
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.5
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	909	23	0	2246	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	988	25	0	2441	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	294			578		
pX, platoon unblocked			0.93		0.68	0.93
vC, conflicting volume			1013		1814	342
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			869		817	149
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			719		215	812

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	395	395	223	814	814	814	38
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	25	0	0	0	38
cSH	1700	1700	1700	1700	1700	1700	812
Volume to Capacity	0.23	0.23	0.13	0.48	0.48	0.48	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.6
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.6
Approach LOS							A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					0.95	0.91	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	1667	1863	5353					1770	1704	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	1667	1863	5353					1770	1704	1583
Volume (vph)	0	3082	1470	433	802	0	0	0	0	626	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	3145	1500	451	835	0	0	0	0	688	21	74
RTOR Reduction (vph)	0	0	185	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	3145	1315	451	835	0	0	0	0	353	356	14
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Prot	Prot						Split		Prot
Protected Phases		2	2	1	6					4	4	4
Permitted Phases												
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	986	286	4181					284	274	254
v/s Ratio Prot		0.59	c0.79	c0.24	0.16					0.20	c0.21	0.01
v/s Ratio Perm												
v/c Ratio		0.99	1.33	1.58	0.20					1.24	1.30	0.05
Uniform Delay, d1		27.7	28.0	58.0	3.9					57.5	57.5	48.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		14.5	157.2	275.8	0.1					135.5	158.9	0.1
Delay (s)		42.3	185.2	333.8	4.0					193.0	216.4	48.8
Level of Service		D	F	F	A					F	F	D
Approach Delay (s)		88.4			119.6			0.0			190.0	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM Average Control Delay	106.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	136.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	5.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	0.88	1.00	0.91					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.97	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	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5353	2858	1863	5353					1770	1704	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5353	2858	1863	5353					1770	1704	1583
Volume (vph)	0	3082	1470	433	802	0	0	0	0	626	19	67
Peak-hour factor, PHF	0.98	0.98	0.98	0.96	0.96	0.96	0.25	0.25	0.25	0.91	0.91	0.91
Adj. Flow (vph)	0	3145	1500	451	835	0	0	0	0	688	21	74
RTOR Reduction (vph)	0	0	325	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	3145	1175	451	835	0	0	0	0	353	356	14
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			9			3						
Turn Type			Perm	Prot						Split		Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			2									
Actuated Green, G (s)		79.5	79.5	21.5	105.5					21.0	21.0	21.0
Effective Green, g (s)		81.0	81.0	21.0	107.0					22.0	22.0	22.0
Actuated g/C Ratio		0.59	0.59	0.15	0.78					0.16	0.16	0.16
Clearance Time (s)		5.5	5.5	4.5	5.5					5.0	5.0	5.0
Vehicle Extension (s)		6.0	6.0	3.0	6.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3165	1690	286	4181					284	274	254
v/s Ratio Prot		c0.59		c0.24	0.16					0.20	c0.21	0.01
v/s Ratio Perm			0.41									
v/c Ratio		0.99	0.70	1.58	0.20					1.24	1.30	0.05
Uniform Delay, d1		27.7	19.4	58.0	3.9					57.5	57.5	48.7
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		14.5	1.9	275.8	0.1					135.5	158.9	0.1
Delay (s)		42.3	21.3	333.8	4.0					193.0	216.4	48.8
Level of Service		D	C	F	A					F	F	D
Approach Delay (s)		35.5			119.6			0.0			190.0	
Approach LOS		D			F			A			F	

Intersection Summary			
HCM Average Control Delay	69.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	107.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0	4.0	5.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	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	0.97	1.00
Satd. Flow (prot)	1863	5353	1630	1863	5196		1770	1856	1667	1770	1814	1657
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1863	5353	1630	1863	5196		1770	1856	1667	1770	1814	1657
Volume (vph)	210	2510	1057	322	784	159	206	187	596	203	63	266
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	223	2670	1124	346	843	171	248	225	718	245	76	320
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	8	0	0	113
Lane Group Flow (vph)	223	2670	1124	346	1000	0	231	242	710	156	165	207
Confl. Peds. (#/hr)	1					1	1					1
Confl. Bikes (#/hr)			5			3						
Turn Type	Prot		Free	Prot			Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6		8	8	1	7	7	5
Permitted Phases			Free						8			7
Actuated Green, G (s)	23.1	68.5	156.2	25.7	71.1		25.2	25.2	50.9	17.3	17.3	40.4
Effective Green, g (s)	22.6	70.0	156.2	25.2	72.6		26.2	26.2	52.4	16.8	16.8	39.4
Actuated g/C Ratio	0.14	0.45	1.00	0.16	0.46		0.17	0.17	0.34	0.11	0.11	0.25
Clearance Time (s)	4.5	5.5		4.5	5.5		5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	6.0		3.0	6.0		2.5	2.5	3.0	4.5	4.5	3.0
Lane Grp Cap (vph)	270	2399	1630	301	2415		297	311	602	190	195	418
v/s Ratio Prot	0.12	c0.50		0.19	0.19		0.13	0.13	c0.20	0.09	0.09	0.07
v/s Ratio Perm			c0.69						0.23			0.05
v/c Ratio	0.83	1.11	0.69	1.15	0.41		0.78	0.78	1.18	0.82	0.85	0.50
Uniform Delay, d1	64.9	43.1	0.0	65.5	27.7		62.2	62.2	51.9	68.2	68.4	49.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.3	57.4	2.4	98.6	0.3		11.6	11.2	97.1	25.8	28.9	0.9
Delay (s)	83.2	100.5	2.4	164.1	28.0		73.8	73.4	149.0	94.0	97.4	50.8
Level of Service	F	F	A	F	C		E	E	F	F	F	D
Approach Delay (s)		72.1			62.7			119.1			73.3	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM Average Control Delay	78.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	156.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.1%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5209		1863	5353	1667	1863	3725	1652	1863	3725	1656
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3614	5209		1863	5353	1667	1863	3725	1652	1863	3725	1656
Volume (vph)	686	2207	420	74	867	207	118	496	64	217	481	138
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	746	2399	457	82	963	230	126	528	68	238	529	152
RTOR Reduction (vph)	0	16	0	0	0	49	0	0	5	0	0	26
Lane Group Flow (vph)	746	2840	0	82	963	181	126	528	63	238	529	126
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot			Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	31.1	57.5		9.5	35.9	55.0	12.4	23.9	33.4	14.1	25.6	56.7
Effective Green, g (s)	32.1	58.5		10.5	36.9	55.0	12.4	25.9	36.4	14.1	27.6	59.7
Actuated g/C Ratio	0.26	0.47		0.08	0.30	0.44	0.10	0.21	0.29	0.11	0.22	0.48
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0		4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	928	2438		156	1580	733	185	772	534	210	822	844
v/s Ratio Prot	c0.21	c0.55		0.04	0.18	0.11	0.07	0.14	0.01	c0.13	c0.14	0.04
v/s Ratio Perm									0.03			0.04
v/c Ratio	0.80	1.16		0.53	0.61	0.25	0.68	0.68	0.12	1.13	0.64	0.15
Uniform Delay, d1	43.5	33.2		54.9	37.9	22.0	54.4	45.8	32.5	55.5	44.2	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	79.0		4.1	1.2	0.5	10.7	2.7	0.1	102.6	2.8	0.2
Delay (s)	49.3	112.3		59.0	39.1	22.5	65.1	48.5	32.7	158.1	47.1	18.5
Level of Service	D	F		E	D	C	E	D	C	F	D	B
Approach Delay (s)		99.2			37.4			49.9			71.1	
Approach LOS		F			D			D			E	

Intersection Summary			
HCM Average Control Delay	77.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99	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	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)	3614	5353	1635	1863	5353	1667	3614	3725	1652	1863	3725	2914
Flt Permitted	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 (perm)	3614	5353	1635	1863	5353	1667	3614	3725	1652	1863	3725	2914
Volume (vph)	686	2207	420	74	867	207	118	496	64	217	481	138
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.94	0.94	0.94	0.91	0.91	0.91
Adj. Flow (vph)	746	2399	457	82	963	230	126	528	68	238	529	152
RTOR Reduction (vph)	0	0	55	0	0	48	0	0	5	0	0	44
Lane Group Flow (vph)	746	2399	402	82	963	182	126	528	63	238	529	108
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Confl. Bikes (#/hr)			8									2
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2		1	6	6 7	3	8	1	7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	31.0	57.5	57.5	9.5	36.0	55.1	10.4	23.0	32.5	14.1	26.7	57.7
Effective Green, g (s)	32.0	58.5	58.5	10.5	37.0	55.1	10.4	25.0	35.5	14.1	28.7	60.7
Actuated g/C Ratio	0.26	0.47	0.47	0.08	0.30	0.44	0.08	0.20	0.29	0.11	0.23	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		4.0	6.0	5.0	4.0	6.0	5.0
Vehicle Extension (s)	5.0	6.0	6.0	4.0	6.0		4.0	4.0	4.0	4.0	6.0	5.0
Lane Grp Cap (vph)	932	2523	771	158	1596	740	303	750	526	212	861	1519
v/s Ratio Prot	c0.21	c0.45		0.04	0.18	0.11	0.03	c0.14	0.01	c0.13	c0.14	0.02
v/s Ratio Perm			0.25						0.03			0.02
v/c Ratio	0.80	0.95	0.52	0.52	0.60	0.25	0.42	0.70	0.12	1.12	0.61	0.07
Uniform Delay, d1	43.1	31.4	23.0	54.4	37.3	21.5	54.0	46.1	32.7	55.0	42.7	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	9.4	1.6	3.8	1.2	0.5	1.3	3.2	0.1	98.7	2.3	0.0
Delay (s)	48.7	40.8	24.6	58.2	38.4	22.0	55.2	49.3	32.9	153.7	45.0	16.8
Level of Service	D	D	C	E	D	C	E	D	C	F	D	B
Approach Delay (s)		40.4			36.7			48.8			68.5	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM Average Control Delay	44.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	124.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.0%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	4.0		4.0	4.0	4.0	3.0	4.0	4.0	1.5	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	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		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	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1863	5346		1863	5353	1667	1863	3725	1667	1863	3725	1667
Volume (vph)	282	2285	15	70	1016	392	11	333	67	482	251	223
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.94	0.94	0.94
Adj. Flow (vph)	317	2567	17	77	1116	431	13	387	78	513	267	237
RTOR Reduction (vph)	0	0	0	0	0	30	0	0	8	0	0	86
Lane Group Flow (vph)	317	2584	0	77	1116	401	13	387	70	513	267	151
Confl. Peds. (#/hr)	2		12	12		2	6		8	8		6
Confl. Bikes (#/hr)			3			1			1			1
Turn Type	Prot			Prot		pt+ov	Prot		pt+ov	Prot		pt+ov
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	4 5
Permitted Phases												
Actuated Green, G (s)	31.7	90.3		10.0	68.6	105.3	4.0	22.6	37.6	31.7	48.8	85.5
Effective Green, g (s)	31.2	91.3		10.5	69.6	106.8	8.0	23.6	38.1	35.7	49.8	86.0
Actuated g/C Ratio	0.18	0.52		0.06	0.40	0.61	0.05	0.14	0.22	0.20	0.29	0.49
Clearance Time (s)	4.5	5.0		4.5	5.0		7.0	5.0		5.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0		4.0	4.5		6.0	5.0	
Lane Grp Cap (vph)	333	2795		112	2134	1020	85	503	364	381	1062	821
v/s Ratio Prot	c0.17	c0.48		0.04	0.21	0.24	0.01	c0.10	0.04	c0.28	0.07	0.09
v/s Ratio Perm												
v/c Ratio	0.95	0.92		0.69	0.52	0.39	0.15	0.77	0.19	1.35	0.25	0.18
Uniform Delay, d1	71.0	38.5		80.4	39.9	17.3	80.0	72.9	55.7	69.4	48.0	24.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.6	6.6		16.1	0.9	0.7	1.1	7.8	0.4	172.5	0.3	0.2
Delay (s)	107.6	45.1		96.6	40.8	18.0	81.2	80.7	56.1	241.9	48.3	24.9
Level of Service	F	D		F	D	B	F	F	E	F	D	C
Approach Delay (s)		51.9			37.4			76.7			140.5	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	64.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	174.6	Sum of lost time (s)	10.5
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	5.0	5.0	4.0	4.0	5.0
Lane Util. Factor	0.97	0.91	1.00		1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	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
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	5353	1613		1863	5353	1632	1863	1961	1644	3614	1961
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	5353	1613		1863	5353	1632	1863	1961	1644	3614	1961
Volume (vph)	332	2123	259	69	115	997	253	196	45	124	270	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92	0.83	0.83
Adj. Flow (vph)	361	2308	282	75	122	1061	269	213	49	135	325	60
RTOR Reduction (vph)	0	0	70	0	0	0	127	0	0	60	0	0
Lane Group Flow (vph)	361	2308	212	0	197	1061	142	213	49	75	325	60
Confl. Peds. (#/hr)	5		4		4		5	3		2	2	
Confl. Bikes (#/hr)			1				3					
Turn Type	Prot		Perm	Prot	Prot		Perm	Prot		Perm	Prot	
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2				6			8		
Actuated Green, G (s)	17.3	66.6	66.6		16.2	65.5	65.5	14.6	16.1	16.1	12.1	14.1
Effective Green, g (s)	17.3	67.6	67.6		16.2	66.5	66.5	14.1	15.6	16.6	13.1	13.6
Actuated g/C Ratio	0.13	0.52	0.52		0.13	0.51	0.51	0.11	0.12	0.13	0.10	0.11
Clearance Time (s)	4.0	5.0	5.0		4.0	5.0	5.0	4.5	4.5	4.5	5.0	4.5
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	483	2794	842		233	2749	838	203	236	211	366	206
v/s Ratio Prot	0.10	c0.43			c0.11	0.20		c0.11	0.02		0.09	0.03
v/s Ratio Perm			0.13				0.09			c0.05		
v/c Ratio	0.75	0.83	0.25		0.85	0.39	0.17	1.05	0.21	0.35	0.89	0.29
Uniform Delay, d1	54.0	26.0	17.0		55.4	19.1	16.8	57.7	51.4	51.6	57.5	53.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	2.9	0.7		23.5	0.4	0.4	76.7	0.4	1.0	21.9	0.8
Delay (s)	60.2	29.0	17.7		78.9	19.5	17.2	134.4	51.8	52.6	79.4	54.3
Level of Service	E	C	B		E	B	B	F	D	D	E	D
Approach Delay (s)		31.7				26.8			96.4			67.5
Approach LOS		C				C			F			E

Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	129.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	2000
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1642
Flt Permitted	1.00
Satd. Flow (perm)	1642
Volume (vph)	174
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	210
RTOR Reduction (vph)	188
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	14.1
Effective Green, g (s)	13.6
Actuated g/C Ratio	0.11
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	172
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.13
Uniform Delay, d1	52.6
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	52.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	UL	T	T	T	R	L
Maximum Queue (ft)	159	181	266	277	249	213	174	242	235	236	174	262
Average Queue (ft)	115	143	221	226	225	67	159	206	159	170	89	119
95th Queue (ft)	174	199	266	266	238	143	208	288	253	253	189	217
Link Distance (ft)			220	220	220	220		181	181	181		346
Upstream Blk Time (%)			23	19	38	0	22	37	7	7	0	
Queuing Penalty (veh)			155	130	258	3	0	177	35	33	0	
Storage Bay Dist (ft)	255	255					230				230	
Storage Blk Time (%)			23				22	37		7	0	
Queuing Penalty (veh)			76				74	68		17	1	

Intersection: 5: Great Mall Pkwy & McCandless Drive

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	L	T	R
Maximum Queue (ft)	96	113	204	197	124	98
Average Queue (ft)	28	41	105	111	37	41
95th Queue (ft)	71	87	177	185	89	77
Link Distance (ft)	346	346	212	212	212	212
Upstream Blk Time (%)			0	1	0	
Queuing Penalty (veh)			0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	361	2308	282	197	1061	269	213	49	135	325	60	210
v/c Ratio	0.75	0.83	0.31	0.85	0.39	0.28	1.05	0.21	0.50	0.89	0.29	0.58
Control Delay	65.2	30.6	10.5	86.7	22.0	4.0	132.0	50.9	31.2	83.8	54.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	30.6	10.5	86.7	22.0	4.0	132.0	50.9	31.2	83.8	54.8	12.8
Queue Length 50th (ft)	144	522	52	156	174	3	~175	37	51	133	47	0
Queue Length 95th (ft)	240	#987	163	#385	350	64	#448	73	110	#259	80	46
Internal Link Dist (ft)		186			160			394			222	
Turn Bay Length (ft)	255			230		230						
Base Capacity (vph)	618	2791	909	232	2743	963	203	550	520	366	525	593
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.83	0.31	0.85	0.39	0.28	1.05	0.09	0.26	0.89	0.11	0.35

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	5344		1863	5353	1632	1863	1702		3614	1961	1631
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	5344		1863	5353	1632	1863	1702		3614	1961	1631
Volume (vph)	75	2487	24	30	1244	470	10	2	10	317	9	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.55	0.55	0.55	0.75	0.75	0.75
Adj. Flow (vph)	81	2674	26	33	1352	511	18	4	18	423	12	67
RTOR Reduction (vph)	0	0	0	0	0	208	0	17	0	0	0	53
Lane Group Flow (vph)	81	2700	0	33	1352	303	18	5	0	423	12	14
Confl. Peds. (#/hr)			1	1			14		1	1		14
Confl. Bikes (#/hr)			8			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.5	48.7		2.5	44.7	44.7	2.3	7.1		12.8	18.1	18.1
Effective Green, g (s)	7.0	49.7		3.0	45.7	45.7	2.8	7.1		13.8	18.1	18.1
Actuated g/C Ratio	0.08	0.55		0.03	0.51	0.51	0.03	0.08		0.15	0.20	0.20
Clearance Time (s)	4.5	5.0		4.5	5.0	5.0	4.5	4.0		5.0	4.0	4.0
Vehicle Extension (s)	2.0	4.5		2.0	4.5	4.5	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	146	2964		62	2730	832	58	135		557	396	329
v/s Ratio Prot	c0.04	c0.51		0.02	0.25		0.01	0.00		c0.12	0.01	
v/s Ratio Perm						0.19						c0.01
v/c Ratio	0.55	0.91		0.53	0.50	0.36	0.31	0.04		0.76	0.03	0.04
Uniform Delay, d1	39.8	18.0		42.6	14.4	13.2	42.5	38.1		36.3	28.7	28.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	4.9		4.3	0.2	0.5	2.2	0.1		5.6	0.0	0.0
Delay (s)	42.4	22.9		46.9	14.6	13.7	44.7	38.2		41.9	28.7	28.8
Level of Service	D	C		D	B	B	D	D		D	C	C
Approach Delay (s)		23.4			14.9			41.1			39.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.86	1.00	0.86	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3614	6745	1863	6745	1667	3614	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3614	6745	1863	6745	1667	3614	1667
Volume (vph)	498	3181	58	1865	179	673	777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	541	3458	63	2027	195	732	845
RTOR Reduction (vph)	0	0	0	0	27	0	0
Lane Group Flow (vph)	541	3458	63	2027	168	732	845
Turn Type	Prot		Prot		Perm		Free
Protected Phases	1	6	5	2		4	
Permitted Phases					2		Free
Actuated Green, G (s)	33.8	122.2	11.8	100.2	100.2	41.4	190.0
Effective Green, g (s)	33.8	123.5	11.8	101.5	101.5	42.7	190.0
Actuated g/C Ratio	0.18	0.65	0.06	0.53	0.53	0.22	1.00
Clearance Time (s)	4.0	5.3	4.0	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	4.0	3.0	4.0	4.0	3.0	
Lane Grp Cap (vph)	643	4384	116	3603	891	812	1667
v/s Ratio Prot	c0.15	c0.51	0.03	0.30		c0.20	
v/s Ratio Perm					0.10		0.51
v/c Ratio	0.84	0.79	0.54	0.56	0.19	0.90	0.51
Uniform Delay, d1	75.5	23.9	86.5	29.5	22.9	71.6	0.0
Progression Factor	1.28	0.57	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1	5.1	0.6	0.5	13.1	1.1
Delay (s)	97.6	13.7	91.6	30.1	23.4	84.7	1.1
Level of Service	F	B	F	C	C	F	A
Approach Delay (s)		25.1		31.2		39.9	
Approach LOS		C		C		D	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.7%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3614	6745	1667	3614	6745	1667	3614	3725	1667	3614	5313	
Volume (vph)	254	2592	338	339	1290	780	203	681	356	1150	1744	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	2817	367	368	1402	848	221	740	387	1250	1896	98
RTOR Reduction (vph)	0	0	0	0	0	319	0	0	87	0	3	0
Lane Group Flow (vph)	276	2817	367	368	1402	529	221	740	300	1250	1991	0
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			Free			6			4			
Actuated Green, G (s)	18.9	56.7	190.0	18.9	56.7	56.7	9.5	43.6	43.6	48.5	83.6	
Effective Green, g (s)	20.4	58.0	190.0	20.4	58.0	58.0	11.0	44.6	44.6	51.0	84.6	
Actuated g/C Ratio	0.11	0.31	1.00	0.11	0.31	0.31	0.06	0.23	0.23	0.27	0.45	
Clearance Time (s)	5.5	5.3		5.5	5.3	5.3	5.5	5.0	5.0	6.5	5.0	
Vehicle Extension (s)	3.0	6.0		3.0	6.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)	388	2059	1667	388	2059	509	209	874	391	970	2366	
v/s Ratio Prot	0.08	c0.42		c0.10	0.21		0.06	0.20		c0.35	c0.37	
v/s Ratio Perm			0.22			0.32			0.18			
v/c Ratio	0.71	1.37	0.22	0.95	0.68	1.04	1.06	0.85	0.77	1.29	0.84	
Uniform Delay, d1	82.0	66.0	0.0	84.3	57.9	66.0	89.5	69.4	67.8	69.5	46.7	
Progression Factor	1.29	0.31	1.00	1.03	1.50	2.23	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	166.4	0.1	29.0	1.6	47.4	78.2	7.9	9.2	137.7	3.0	
Delay (s)	106.9	186.8	0.1	116.0	88.5	194.5	167.7	77.4	77.1	207.2	49.8	
Level of Service	F	F	A	F	F	F	F	E	E	F	D	
Approach Delay (s)		160.6			126.7			92.1			110.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	128.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.3%	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												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00	0.97	1.00	1.00	0.97	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	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Flt Permitted	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 (perm)	1863	6745	1667	1863	6745	1667	3614	1961	1667	3614	1961	1667
Volume (vph)	178	2863	1635	244	1406	53	1036	129	182	28	144	132
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	3112	1777	265	1528	58	1126	140	198	30	157	143
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	193	3112	1777	265	1528	58	1126	140	91	30	157	143
Turn Type	Prot		Free	Prot		Free	Split		Perm	Split		Free
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases			Free			Free			3			Free
Actuated Green, G (s)	23.6	80.0	190.0	24.0	80.4	190.0	53.0	53.0	53.0	13.0	13.0	190.0
Effective Green, g (s)	24.6	81.0	190.0	25.0	81.4	190.0	54.0	54.0	54.0	14.0	14.0	190.0
Actuated g/C Ratio	0.13	0.43	1.00	0.13	0.43	1.00	0.28	0.28	0.28	0.07	0.07	1.00
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	241	2876	1667	245	2890	1667	1027	557	474	266	144	1667
v/s Ratio Prot	0.10	0.46		0.14	0.23		0.31	0.07		0.01	0.08	
v/s Ratio Perm			c1.07			0.03			0.05			0.09
v/c Ratio	0.80	1.08	1.07	1.08	0.53	0.03	1.10	0.25	0.19	0.11	1.09	0.09
Uniform Delay, d1	80.3	54.5	95.0	82.5	40.1	0.0	68.0	52.4	51.5	82.2	88.0	0.0
Progression Factor	1.00	1.00	1.00	0.64	1.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.0	43.9	42.0	72.2	0.5	0.0	58.2	0.3	0.3	0.3	101.2	0.1
Delay (s)	98.3	98.4	137.0	124.7	76.4	0.0	126.2	52.7	51.7	82.5	189.2	0.1
Level of Service	F	F	F	F	E	A	F	D	D	F	F	A
Approach Delay (s)		111.9			80.9			109.1			97.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	104.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	193	3112	1777	265	1528	58	1126	140	198	30	157	143
v/c Ratio	0.80	1.08	1.07	1.08	0.53	0.03	1.10	0.25	0.34	0.11	1.09	0.09
Control Delay	103.6	94.5	46.3	121.4	77.2	0.0	119.1	53.9	15.8	83.4	177.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.6	94.5	46.3	121.4	77.2	0.0	119.1	53.9	15.8	83.4	177.0	0.1
Queue Length 50th (ft)	235	~1257	~284	~375	568	0	~815	136	45	18	~219	0
Queue Length 95th (ft)	334	#1293	#527	m#551	m595	m0	#953	205	121	38	#387	0
Internal Link Dist (ft)		690			684			107			258	
Turn Bay Length (ft)	200		250	250		100			75	180		200
Base Capacity (vph)	265	2876	1667	245	2889	1667	1027	557	581	266	144	1667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	1.08	1.07	1.08	0.53	0.03	1.10	0.25	0.34	0.11	1.09	0.09

Intersection Summary

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	120	0	41	19	0	43	76	202	0	0	239	185
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	125	0	43	20	0	45	79	210	0	0	249	193
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											474	
pX, platoon unblocked	0.99	0.99	0.99	0.99	0.99		0.99					
vC, conflicting volume	759	714	345	757	810	210	442			210		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	756	711	338	754	808	210	436			210		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	56	100	94	93	100	95	93			100		
cM capacity (veh/h)	287	329	696	286	289	830	1112			1360		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	168	20	45	79	210	442
Volume Left	125	20	0	79	0	0
Volume Right	43	0	45	0	0	193
cSH	338	286	830	1112	1700	1700
Volume to Capacity	0.50	0.07	0.05	0.07	0.12	0.26
Queue Length 95th (ft)	66	6	4	6	0	0
Control Delay (s)	25.7	18.5	9.6	8.5	0.0	0.0
Lane LOS	D	C	A	A		
Approach Delay (s)	25.7	12.3		2.3		0.0
Approach LOS	D	B				

Intersection Summary			
Average Delay	6.0		
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			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	0	22	10	0	4	56	258	62	62	199	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	0	24	11	0	4	61	280	67	67	216	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								763				
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	812	841	237	832	828	314	258			348		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	802	833	237	823	819	278	258			313		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	96	100	99	95			94		
cM capacity (veh/h)	263	260	802	249	265	723	1307			1184		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	15	409	325
Volume Left	17	11	61	67
Volume Right	24	4	67	41
cSH	431	306	1307	1184
Volume to Capacity	0.10	0.05	0.05	0.06
Queue Length 95th (ft)	8	4	4	5
Control Delay (s)	14.2	17.4	1.6	2.1
Lane LOS	B	C	A	A
Approach Delay (s)	14.2	17.4	1.6	2.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	2708	20	0	1367	0	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2943	22	0	1486	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	765			266		
pX, platoon unblocked			0.54		0.60	0.54
vC, conflicting volume			2965		3450	992
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2935		2850	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			65		8	584

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1177	1177	610	495	495	495	7
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	22	0	0	0	7
cSH	1700	1700	1700	1700	1700	1700	584
Volume to Capacity	0.69	0.69	0.36	0.29	0.29	0.29	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.2
Approach LOS							B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	2517	69	0	1434	0	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2736	75	0	1559	0	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	240			621		
pX, platoon unblocked			0.63		0.71	0.63
vC, conflicting volume			2811		3293	949
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2699		2357	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			94		21	682

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1094	1094	622	520	520	520	25
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	75	0	0	0	25
cSH	1700	1700	1700	1700	1700	1700	682
Volume to Capacity	0.64	0.64	0.37	0.31	0.31	0.31	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.5
Approach LOS							B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		