Traffic Impact Analysis

20841 INTERNATIONAL BLVD COMMERCIAL

Prepared for:
Llewellyn Real Estate

October 2022

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1.21301.00

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Introduction

The purpose of this traffic impact analysis (TIA) is to identify potential traffic-related impacts associated with the proposed fast-food development. As necessary, mitigation measures are identified that would offset or reduce significant impacts. The scope of the analysis and key study parameters were coordinated with City staff in advance of the report submittal.

Project Description

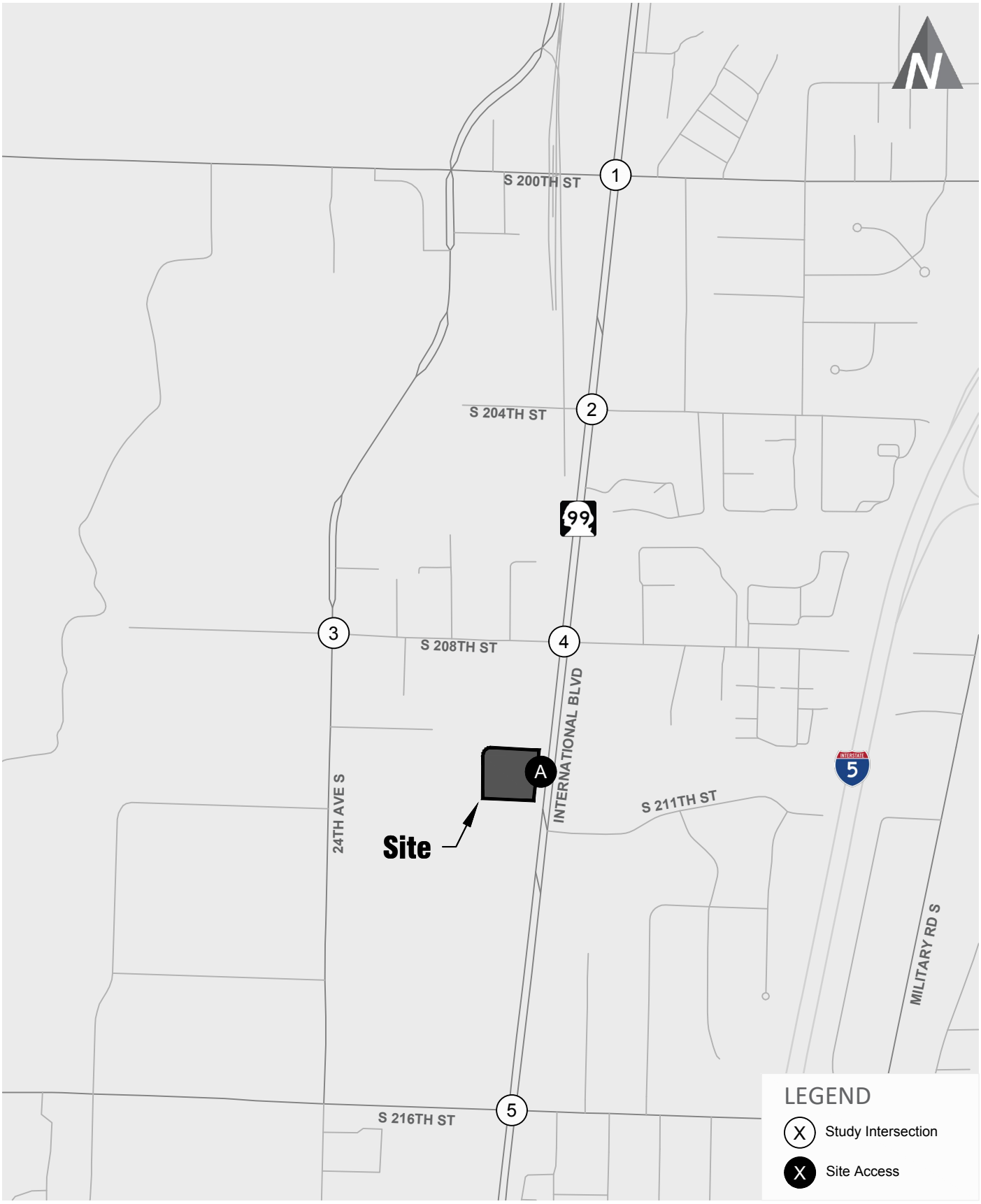
The project is located at 20841 International Boulevard in SeaTac between S 208th Street and S 216th Street west of International Boulevard. Figure 1 illustrates the project site and the surrounding vicinity. The project would include the development of three buildings on site. This will include a 2,810 square foot and a 2,500 square foot fast-food restaurant with drive-through, as well as a 9,550 square foot retail building. Access to the site is proposed via International Boulevard. The site plan is shown in Figure 2. The project is anticipated to be completed by 2025 which was utilized as the horizon year for this analysis.

Study Scope and Area

The analysis scope has been confirmed through coordination with City of SeaTac staff. The analysis focuses on the weekday PM peak period operations at three off-site study intersections as well as the site access driveways. This period represents the highest cumulative total traffic for the adjacent street system providing a conservative timeframe for level of service (LOS) analysis. The study intersections include:

1. International Boulevard (SR 99) / S 200th Street
2. International Boulevard (SR 99) / S 204th Street
3. 24th Avenue S / S 208th Street
4. International Boulevard (SR 99) / S 208th Street
5. International Boulevard (SR 99) / S 216th Street
6. International Boulevard (SR 99) / Site Access

Additionally, the site access location was studied under future with-project conditions. The study focuses on the weekday PM peak hour when traffic volumes for the proposed project and on the surrounding roadway network are anticipated to be highest. The future 2025 horizon year is evaluated consistent with when the proposed project is anticipated to be constructed and occupied. The analysis includes a review of the street network, non-motorized facilities, transit service, planned improvements, existing and future peak hour traffic volumes, traffic operations, and traffic safety. Future with-project conditions are evaluated by adding site-generated traffic to future without-project volumes. Future without-project and with-project conditions were compared to identify the relative impacts the proposed project would have on the surrounding transportation system.



Site Vicinity and Study Intersections

FIGURE 1

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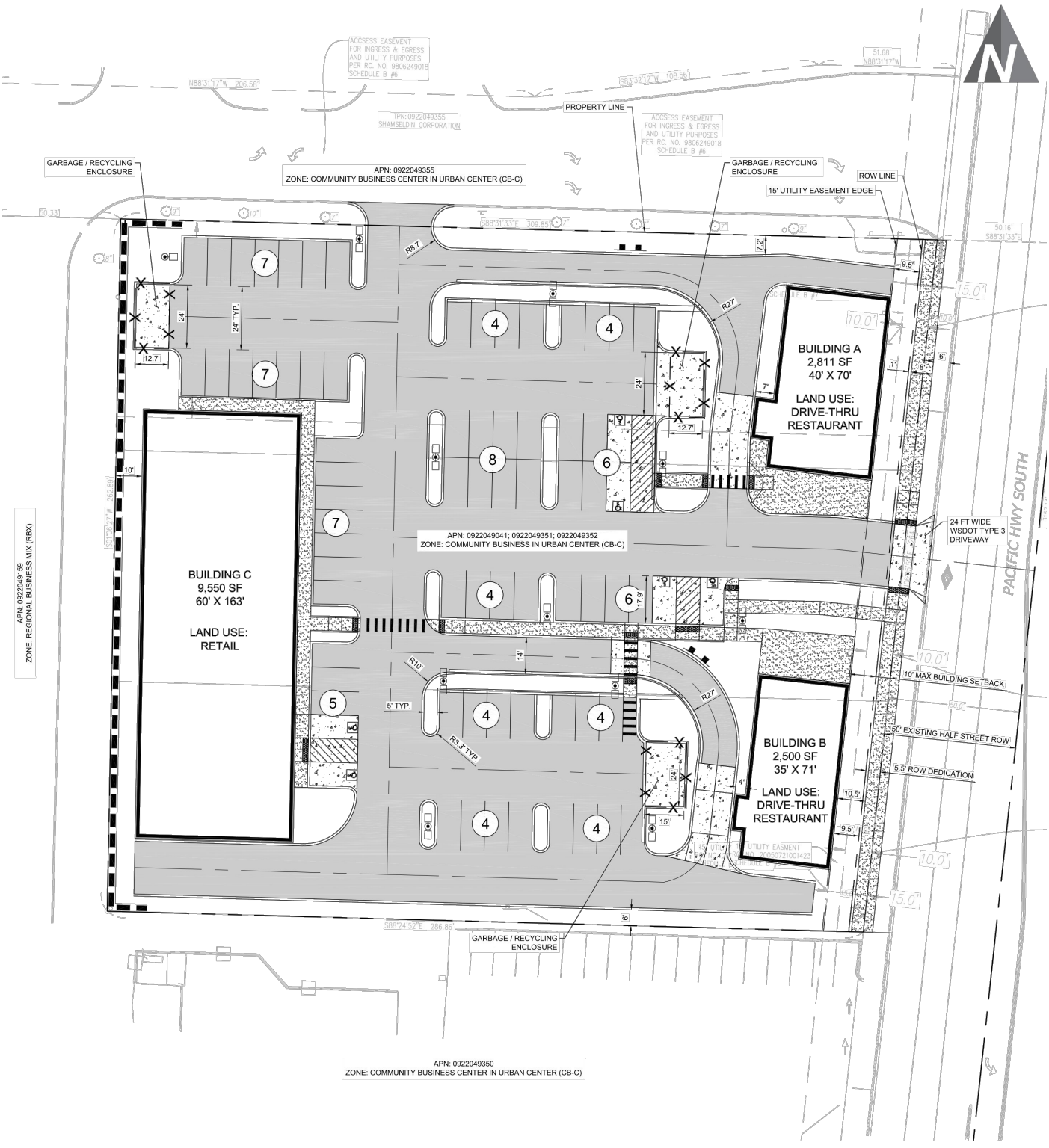
Dec 23, 2021 - 11:26am bornaa M:\21\1.21301.00 - 20841 International Blvd Commerical\Graphics\DWG\21301 Graphics.dwg Layout: Site Vicinity



Preliminary Site Plan

FIGURE
2

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Existing and Without-Project Conditions

This section describes existing condition within the identified study area. Characteristics are provided for the street network, non-motorized facilities, transit service, planned improvements, existing traffic volumes, traffic operations, and traffic safety.

Street Network

The project site is located in SeaTac, west of International Boulevard between S 208th Street and S 216th Street with access to the site provided via International Boulevard. The existing street network near the site is summarized in Table 1.

Table 1. Existing Street Network Summary

Roadway	Classification	Speed Limit	# Lanes	Pedestrian Facilities	Bicycle Facilities
International Blvd (SR 99)	Principal Arterial	40 mph	5[1]	Yes	No
S 200th Street	Principal Arterial	35/25 mph[2]	2/4[3]	Yes	Yes[4]
S 204th Street	Local Street	25 mph	2	Intermittent	No
S 208th Street	Minor Arterial / Local Street[5]	25 mph	2	Intermittent	No
S 216th Street	Principal Arterial / Minor Arterial[6]	35 mph	5/3[7]	Yes	Yes[8]
24th Avenue S	Principal Arterial	35 mph	5[9]	Yes	Yes[8]

Source: Transpo Group, December 2022
1. The western most southbound lane is a transit/carpool lane.
2. The posted speed limit is 35 mph and 25 mph east of 30th Avenue S.
3. 2 lanes west of 26th Avenue S; four lanes east of 26th Avenue S.
4. Eastbound bike lane provided west of 26th Ave S. Bike lanes provided on both sides of the roadway between 26th Avenue S and International Boulevard.
5. Classified as a minor arterial west of International Boulevard and as a local street east of International Boulevard.
6. Principal arterial between 24th Avenue S and International Boulevard, and minor arterial east of International Boulevard.
7. Two lanes in each direction west of International Boulevard and one lane in each direction east of international boulevard with a center two-way left-turn lane both east and west of International Boulevard (5 total lanes west, and 3 total lanes east).
8. Bike lanes available on both sides.
9. Two lanes in each direction with a center two-way left-turn lane (5 total lanes).

Non-Motorized Facilities

As described above sidewalks are provided along International Boulevard within the vicinity of the project as well as along most of the roadways in the study area. Signalized pedestrian crossings are provided at all of the study intersections. Bicycle lanes are provided along 200th Street, S 216th Street S, and 24th Avenue S.

Transit Service

Within the vicinity of the site, the King County RapidRide A Line runs along International Boulevard. The A Line runs provides service between the Tukwila and Federal Way with 10-minute headways during the weekday AM and PM peak hours. The nearest stops to the site are located along International Boulevard at S 208th Street. In addition, King County Route 635 operates in the area with a stop located approximately 0.3 miles or a 6-minute walk from the site at the 24th Avenue S and S 211th Street stop. Route 635 is the Des Moines community shuttle and provides service between the Link light rail Angle Station and the Des Moines Marina District. Service is provided between approximately 5:20 a.m. and 7:00 p.m. with approximately 15 to 30-minute headways.

In addition to the King County Metro routes, Sound Transit's Link Light Rail provides service from Angle Lake to the SeaTac Airport, Seattle, University of Washington, and Northgate. Link Light Rail will be extended to Lynnwood by 2023. The Angle Lake station is located at the 28th Avenue S / S 200th Street intersection, approximately one mile north of the site.

Planned Improvements

The City of SeaTac 2022 to 2027 Transportation Improvement Program (TIP) was reviewed to understand potential improvements in the area that could impact intersection operations. Within the study area a corridor study was completed to identify and implement improvements along S 200th Street between 26th Avenue S and S Military Road S. The project currently has funding for the design phase. Roadway improvements are also planned along S 208th Street between International Boulevard and 24th the Avenue S and S 216 Street between I-5 and 35th Avenue S. The improvements are not anticipated to result in changes to the capacity at the intersections at International Boulevard or 24th Avenue S.

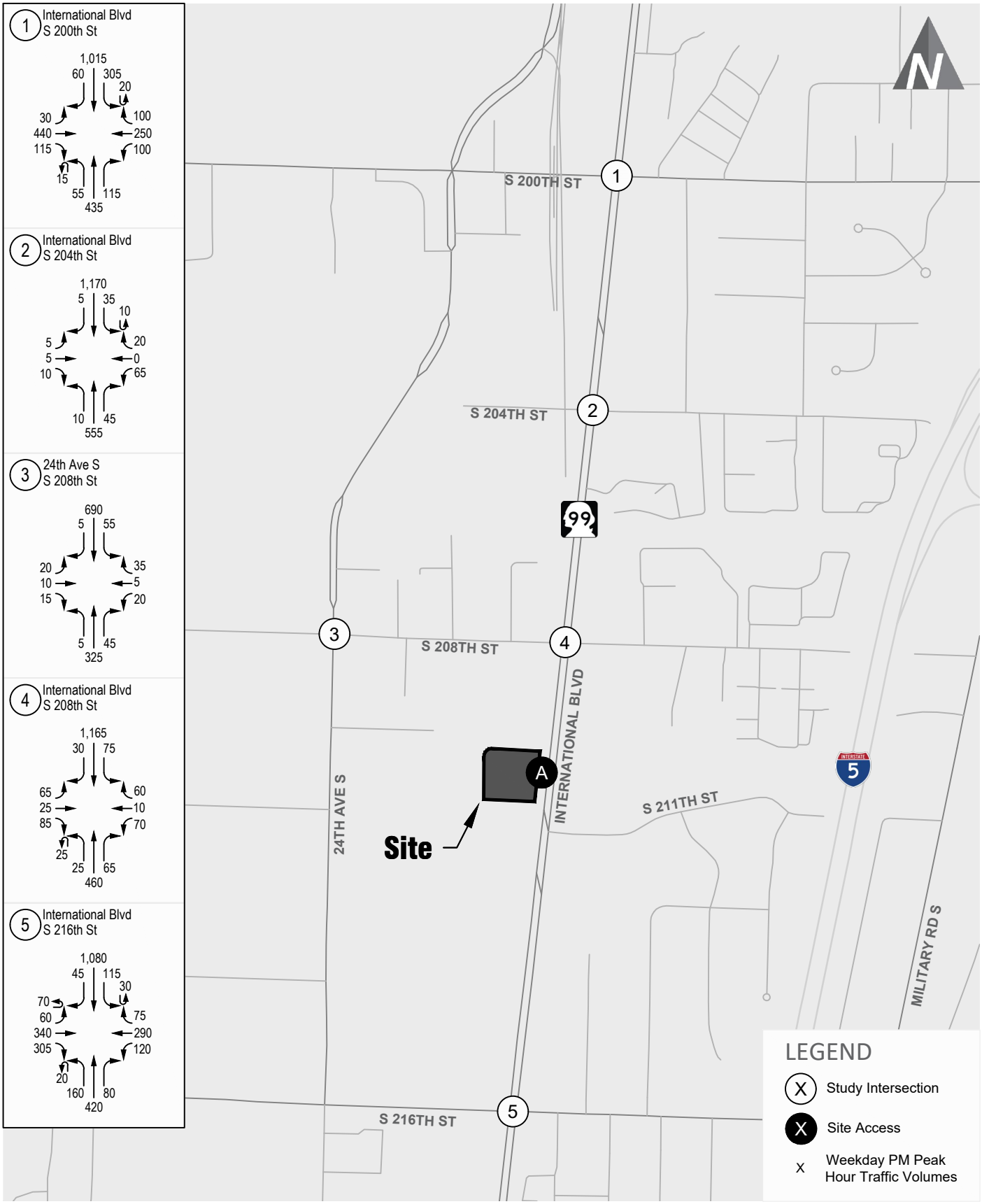
The City has also identified a safety study along International Boulevard to evaluate safety improvements for collision reductions along the corridor. Based on information published in the TIP, possible improvements assumed could include four near-side traffic signals and improvements to discourage illegal pedestrian crossings. This project is in the planning stages and therefore no improvements were assumed in the analysis.

Additional improvements in the area include the SR 509 Extension Phase 1 between the existing SR 509 terminus at 28th Avenue S/24th Avenue S intersection and I-5, and the extension to the existing Link light rail service from the Angle Lake Station on S 200th Street to the Federal Way Transit Center. Following completion of the SR 509 Phase 1 and Federal Way Link extension, improvements along the S 200th Street corridor between International Boulevard and Military Road S will begin.

Traffic Volumes

This transportation analysis focuses on the weekday PM peak hour, consistent with City standards. Existing turning movement counts at the study intersections were collected in October 2022. Intersection counts are provided in Appendix A. Existing weekday PM peak hour traffic volumes are summarized on Figure 3 and were rounded to the nearest 5 vehicles to account for daily fluctuations in traffic.

Future without-project weekday PM peak hour traffic volumes were estimated by increasing existing traffic volumes by 1.55 percent per year to 2025 conditions. This growth rate was determined in coordination with the City of SeaTac and is consistent with observed average increase in population in King County from 2019 to 2022. No pipeline projects were identified within the study area. Figure 4 illustrates 2025 without-project weekday PM peak hour traffic volumes at off-site study intersections.



Existing Weekday PM Peak Hour Traffic Volumes

FIGURE 3

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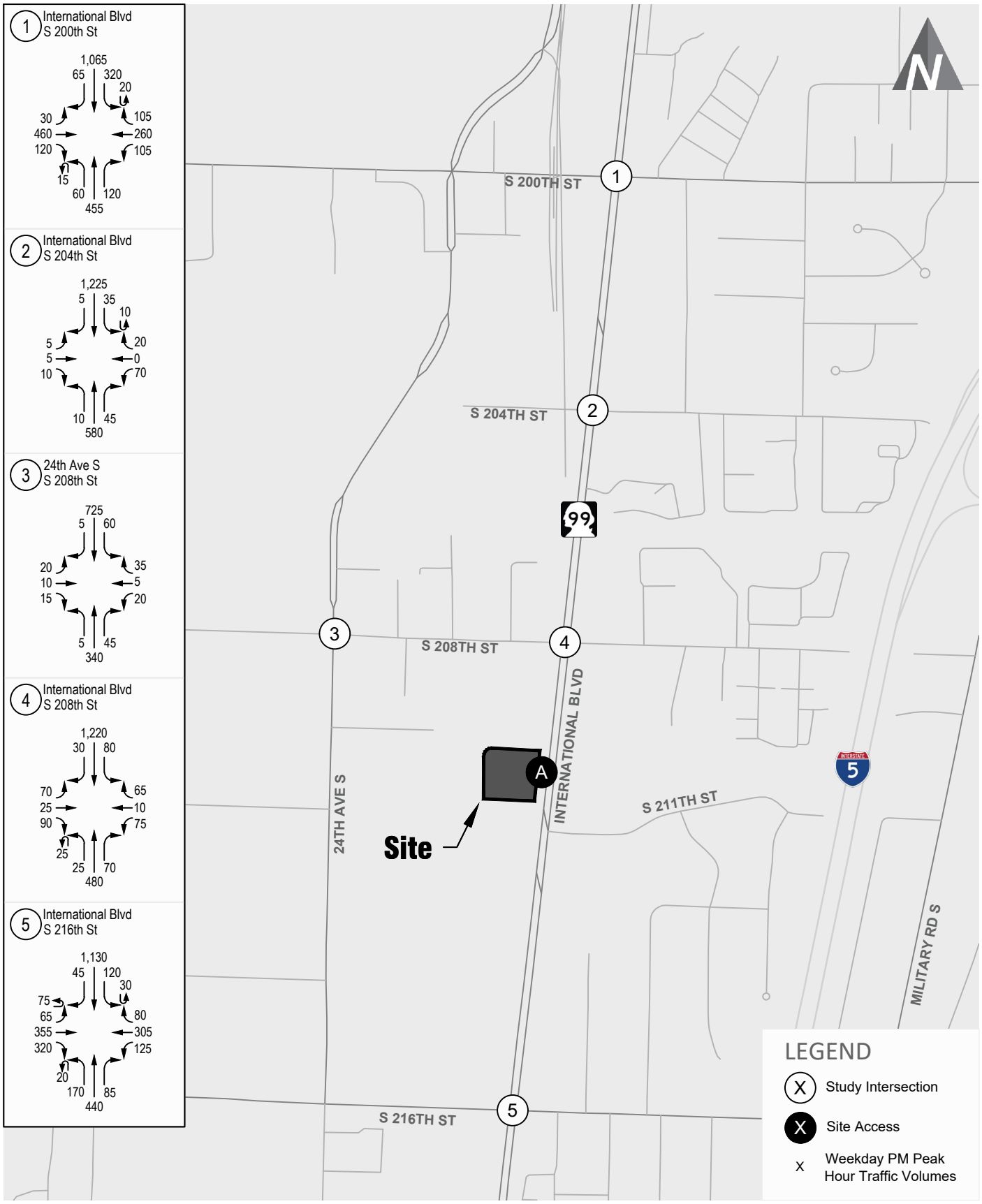

Future (2025) Without-Project Weekday PM Peak Hour Traffic Volumes

FIGURE 4

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Traffic Operations

The operational characteristics of an intersection are evaluated by determining the intersection's level of service (LOS). The intersection as a whole and its individual turning movements, can be described alphabetically with a range of levels of service (LOS A to F). LOS A indicates free-flow traffic and LOS F indicates extreme congestion and long vehicle delays. LOS is measured in average control delay per vehicle and is reported using the intersection delay. At stop-controlled intersections, LOS is measured by the average delay on the worst-movement of the intersection. A more detailed explanation of LOS is provided in Appendix B.

Intersection operations analyses at the study intersections were evaluated using the *Highway Capacity Manual* (HCM) 6th Edition, Transportation Research Board methodology using the Synchro software version 11. Where conditions at an intersection are not able to be evaluated using the 6th Edition HCM methodology due to the U-Turning movements, the intersections will be evaluated using the HCM 2000 methods. Table 2 shows the results of the weekday PM peak hour level of service calculations for existing and future 2025 without project conditions. Detailed intersection levels of service worksheets are contained in Appendix C.

The City of SeaTac has a LOS E standard along principal and minor arterials[1] and WSDOT LOS E standard for International Boulevard (SR 99).

Table 2. Existing and Future (2025) Without-Project Weekday PM Peak Hour Level of Service

		2021 Existing		Future 2025 Without-Project	
Intersections	**Traffic Control**	**LOS[1]**	**Delay[2]**	**LOS**	**Delay**
1. International Blvd (SR 99) / S 200th St	Signal	D	47	D	48
2. International Blvd (SR 99) / S 204th St	Signal	B	16	B	17
3. 24th Ave S / S 208th St	Signal	B	10	B	10
4. International Blvd (SR 99) / S 208th St	Signal	B	18	B	18
5. International Blvd (SR 99) / S 216th St	Signal	D	53	E	63

1. Level of service (LOS), based on Highway Capacity Manual (6th edition) and Highway Capacity Manual (2000) methodology.
2. Average delay in seconds per vehicle.

As shown in Table 2, all of the study intersections are currently operating at LOS D or better during the weekday PM peak hour, meeting the City's LOS standard. Under the future without-project conditions, the study intersections are forecast to operate at LOS E or better and would continue to meet City LOS standards.

Traffic Safety

The Washington State Department of Transportation (WSDOT) provided the collision data for the most recent five-year period for the study area intersections. Data was summarized between January 1, 2017 and December 31, 2021. Table 3 provides a summary of collision history at the study area intersections.

[1] *City of SeaTac Transportation Element Update & Transportation Master Plan,* Transpo Group, December 2014.

Table 3. Five-Year Collision Summary – 2017 to 2021

Location	Number of Collisions					Total	Annual Average	Collisions per MEV[1]
	2017	2018	2019	2020	2021			
1. International Blvd (SR 99) / S 200th St	21	10	12	8	16	67	13.40	1.26
2. International Blvd (SR 99) / S 204th St	6	11	6	3	5	31	6.20	0.96
3. 24th Ave S / S 208th St	0	0	0	1	1	2	0.40	0.09
4. International Blvd (SR 99) / S 208th St	12	15	8	4	6	45	9.00	1.22
5. International Blvd (SR 99) / S 216th St	3	2	2	5	0	12	2.40	0.21
6. International Blvd/Site Access	2	3	2	3	3	13	2.60	0.43

Source: WSDOT 2022
1. Million Entering Vehicles

Within the analysis period, the highest number of collisions occurred at the International Boulevard/S 200th Street intersection with an average of 13.4 collisions per year. Following was the International Boulevard/S 208th Street intersection with an average of 9.0 collisions per year. The other study intersections experienced between 2 and 6 collisions per year, on average. Overall, collisions were most frequently the result of rear-end collisions, followed by angle collisions. The majority of the time collisions resulted in property damage only. One fatality was reported at the International Boulevard/S 208th Street intersection. 12 pedestrian and bicyclist collisions were reported at the study intersections.

By incorporating the traffic volume at the intersection, the rate of collisions per million entering vehicles (MEV) allows a uniform standard for evaluating accident history. Generally, a collision rate at intersections greater than 1.0 to 1.5 collisions per MEV is considered higher than normal. Four of the intersections have a collision per MEV of less than 1.0, and the other two have a rate between 1.0 and 1.5. The highest collision per MEV rate is for the International Boulevard/S 200th Street intersection at 1.26. Consistent with the overall area, the collisions at this intersection were primarily property damage only collisions resulting from rear-end collisions. Of the total number of non-motorized collisions described above, 6 pedestrian and bicyclist collisions were reported at this intersection.

As described previously, the City's TIP has identified a corridor study along International Boulevard to evaluate safety improvements for collision reduction. Improvements could include near-side traffic signals and improvements to discourage illegal pedestrian crossings.

Project Impacts

This section of the report documents project-generated impacts within the study area. First, peak hour traffic volumes are estimated, distributed, and assigned to adjacent roadways and intersections within the study area. Next, 2025 volumes are projected and the potential impact to traffic volumes and traffic operations are identified. The proposed site access is evaluated with respect to traffic operations.

Trip Generation

The proposed project includes two fast-food restaurants with drive-through and a strip retail plaza. Weekday PM peak hour trip generation for the proposed development was estimated based on the land use size and trip rates from the Institute of Transportation Engineers' (ITE) *Trip Generation,* 9th Edition for Fast-Food Restaurant with Drive-Through (LU #934) and Strip Retail Plaza (<40k) (LU #822). The estimated trip generation for the proposed project is shown in Table 4. Detailed trip generation calculations can be found in Appendix D.

Table 4. Estimated Project Trip Generation

			AM Peak Hour Trips[1]			PM Peak Hour Trips[1]		
Land Use	**Size**	**Daily Trips[1]**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Fast-Food Restaurant with Drive-Through (LU #934)	2,811 sf	1,314	64	61	125	48	45	93
Less Pass-by[2]		-690	-31	-31	-62	-26	-26	-52
Subtotal		***624***	***33***	***30***	***63***	***22***	***19***	***41***
Fast-Food Restaurant with Drive-Through (LU #934)	2,500 sf	1,169	57	55	112	43	40	83
Less Pass-by[2]		-614	-28	-28	-56	-23	-23	-46
Subtotal		***555***	***29***	***27***	***56***	***20***	***17***	***37***
Strip Retail Plaza (<40k) (LU #822)	9,550 sf	520	14	9	23	32	31	63
Primary Trips		**1,699**	**76**	**66**	**142**	**74**	**67**	**141**

Notes: sf = square feet
1. Trip generation rates based on ITE Trip Generation Manual (11th Edition, 2021).
2. Pass-by rates from the ITE handbook

As shown in Table 4, the proposed project would generate approximately 1,699 primary weekday daily trips with 142 trips occurring during the weekday AM peak hour and 141 trips during the weekday PM peak hour.

Trip Distribution & Assignment

The weekday PM peak hour vehicular trips associated with the project were distributed to the roadway network based on existing turning movement counts and anticipated travel patterns to/from the development utilizing the International Boulevard access to the site. As noted above, the International Boulevard access is expected to serve as the only access to the site and would operate as a right-in/right-out driveway. The project trip distribution is shown in Figure 5. Trips generated by the project are assigned to the roadway network and the resulting trip assignment is shown in Figure 5. The trip assignment reflects the right-in/right-out limitations of the International Boulevard access point leading to U-turns at S 211th Street for outbound trips ultimately heading north and at S 208th Street for inbound trips coming from the south.

Project Trip Distribution and Assignment

FIGURE
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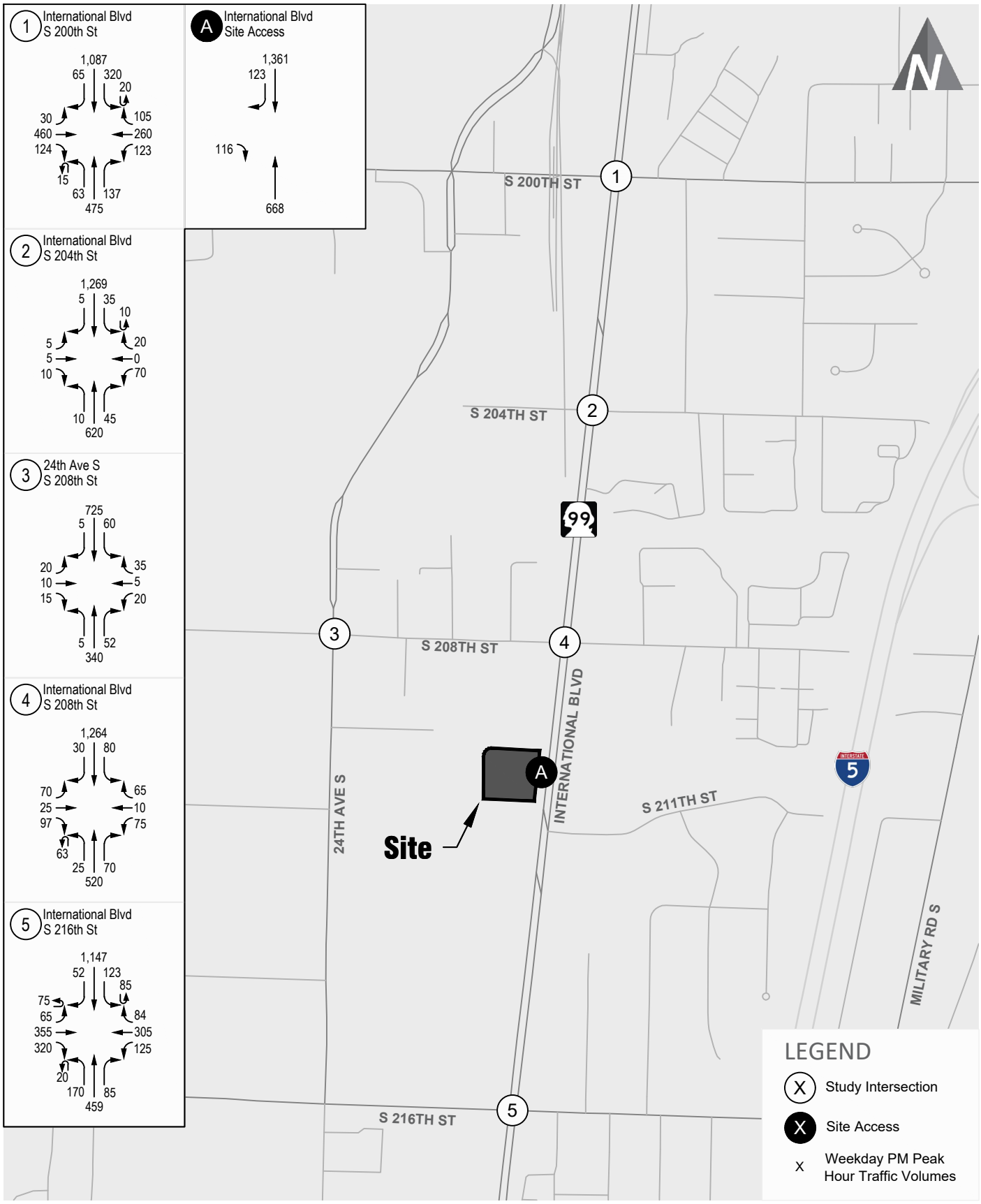

Future (2025) With-Project Weekday PM Peak Hour Traffic Volumes

FIGURE 6

20841 International Blvd Commerical

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Future With-Project Traffic Operations

Traffic operations at the study intersections were evaluated for future 2025 with-project conditions and then compared to future without-project conditions to identify project-related impacts. The intersection LOS for the future 2025 without and with-project scenario is shown in Table 5. Detailed LOS worksheets for the analysis are included in Appendix C.

Table 5. Future (2025) With-Project Weekday PM Peak Hour Level of Service

		Future 2025 Without-Project		Future 2025 With-Project		
Intersections	**Traffic Control**	**LOS[1]**	**Delay[2]**	**LOS**	**Delay**	**WM[3]**
1. International Blvd (SR 99) / S 200th St[4]	Signal	D	48	D	47	-
2. International Blvd (SR 99) / S 204th St	Signal	B	17	B	17	-
3. 24th Ave S / S 208th St	Signal	B	10	B	10	-
4. International Blvd (SR 99) / S 208th St	Signal	B	18	C	20	-
5. International Blvd (SR 99) / S 216th St	Signal	E	63	E	65	-
6. International Blvd (SR 99) /Site Access	Stop Sign	-	-	D	28	EB

1. Level of service (LOS), based on Highway Capacity Manual (6th edition) and Highway Capacity Manual (2000) methodology.
2. Average delay in seconds per vehicle.
3. Worst movement reported for unsignalized intersections where EB = eastbound.
4. The decrease in delay at the intersection is due to the increase in right-turns with the proposed project, reducing the overall weighted average delay at the intersection.

As shown in Table 5, with the addition of project traffic, during the weekday PM peak hour all of the study intersections are forecast to continue to operate at the same LOS as under without-project conditions with minor increases in delay. The proposed project is not anticipated to result in any intersection operational impacts. All intersections are anticipated to continue to meet LOS standards with the project.

As discussed previously one right-in/right-out site access driveway is proposed along International Boulevard. The driveway is forecast to operate at LOS D with approximately 28 seconds of delay during the weekday PM peak hour.

Transportation Impact Fee

The City of SeaTac requires new development to pay a transportation impact fee. The proposed project would construct a 2,811 square foot and a 2,500 square foot fast-food restaurant with drive-through, and 9,550 square feet of retail. The estimated transportation impact fee is summarized in Table 6.

Table 6. Preliminary Transportation Impact Fee Estimate

Land Use	Size	Fee/Unit	Impact Fee per Unit	Estimated Fee
Fast-Food Restaurant with Drive-Through	2,811 sf	1,000 sf	$60,979.00	$171,411.97
Fast-Food Restaurant with Drive-Through	2,500 sf	1,000 sf	$60,979.00	$152,447.50
Retail	9,550 sf	1,000 sf	$9,387.00	$89,645.85
Total				$413,505.32

Source: City of SeaTac Transportation Impact Fees – 2021 Update
Note: sf = square feet

As shown in Table 6 the impact fee for the proposed development is $413,505.32. Traffic impact fees are used to fund improvements in the area. This calculation is provided as a preliminary estimate; the City of SeaTac will calculate the final transportation fee.

Findings and Recommendations

This traffic impact analysis summarizes the project traffic impacts of the proposed commercial development located at 20841 International Boulevard in SeaTac. General findings and recommendations include:

- The project would develop two fast-food restaurants with drive-throughs and a strip retail plaza
- The proposed project would generate approximately 1,699 net new weekday daily trips with 142 trips occurring during the weekday AM peak hour and 141 trips occurring during the weekday PM peak hour.
- All study intersections are anticipated to operate at LOS E with or without the project. No operational issues are anticipated with completion of the proposed project.
- The International Boulevard site access would be restricted to right in/right out only conditions and is forecast to operate at LOS D during the weekday PM peak hour.
- The project would be responsible for paying a transportation impact fee estimated to be $413,505.32. This calculation is provided as a preliminary estimate; the City of SeaTac will calculate the final transportation fee.

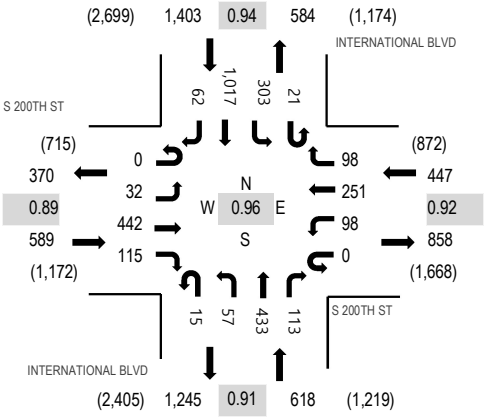
Appendix A: Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

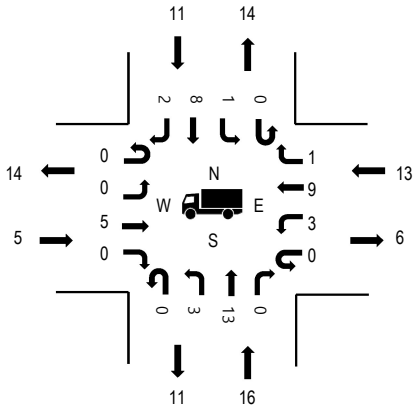
Location: 1 INTERNATIONAL BLVD & S 200TH ST PM
Date: Wednesday, October 12, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

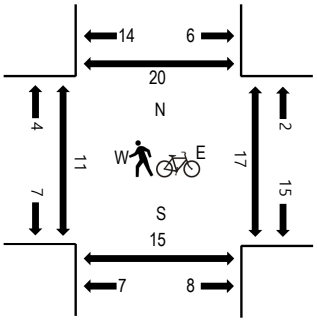
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.8%	0.89
WB	2.9%	0.92
NB	2.6%	0.91
SB	0.8%	0.94
All	1.5%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	S 200TH ST Eastbound				S 200TH ST Westbound				INTERNATIONAL BLVD Northbound				INTERNATIONAL BLVD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	7	100	37	0	21	59	32	2	12	127	19	3	68	218	15	720	2,978
4:15 PM	0	8	104	25	0	22	70	21	5	13	129	25	5	72	268	8	775	3,057
4:30 PM	0	9	115	31	0	28	58	29	2	17	104	25	5	74	219	19	735	3,040
4:45 PM	0	8	91	27	0	21	53	23	3	13	96	35	6	85	272	15	748	3,016
5:00 PM	0	7	132	32	0	27	70	25	5	14	104	28	5	72	258	20	799	2,984
5:15 PM	1	5	100	31	0	20	55	22	4	13	110	21	2	98	258	18	758	
5:30 PM	0	13	105	39	0	24	57	20	3	16	98	23	6	67	228	12	711	
5:45 PM	0	8	108	29	0	31	61	23	6	15	104	28	10	73	209	11	716	
Count Total	1	65	855	251	0	194	483	195	30	113	872	204	42	609	1,930	118	5,962	
Peak Hour	0	32	442	115	0	98	251	98	15	57	433	113	21	303	1,017	62	3,057	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

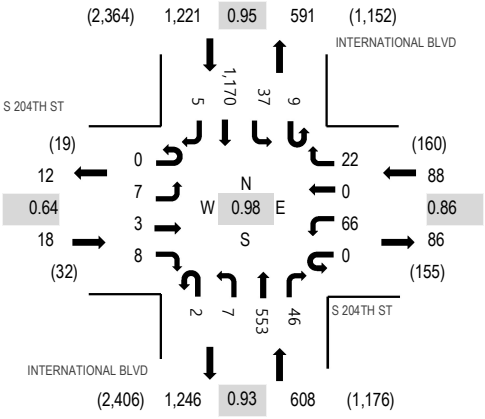
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	4	1	5	12	4:00 PM	11	5	5	12	33
4:15 PM	2	7	6	3	18	4:15 PM	4	2	5	9	20
4:30 PM	1	3	2	2	8	4:30 PM	2	3	2	2	9
4:45 PM	2	3	3	2	10	4:45 PM	2	4	5	7	18
5:00 PM	0	3	2	4	9	5:00 PM	3	6	5	2	16
5:15 PM	2	1	0	5	8	5:15 PM	5	2	3	7	17
5:30 PM	0	4	7	8	19	5:30 PM	6	14	11	13	44
5:45 PM	1	5	2	4	12	5:45 PM	5	9	1	1	16
Count Total	10	30	23	33	96	Count Total	38	45	37	53	173
Peak Hour	5	16	13	11	45	Peak Hour	11	15	17	20	63

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 INTERNATIONAL BLVD & S 204TH ST PM
Date: Wednesday, October 12, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

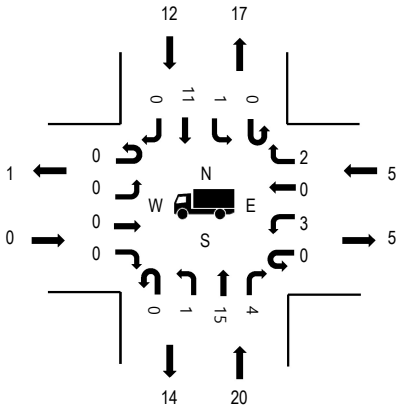
Motorized Vehicles



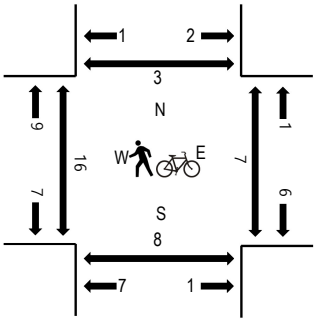
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.64
WB	5.7%	0.86
NB	3.3%	0.93
SB	1.0%	0.95
All	1.9%	0.98

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	S 204TH ST Eastbound				S 204TH ST Westbound				INTERNATIONAL BLVD Northbound				INTERNATIONAL BLVD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	1	1	0	0	15	0	14	0	1	140	16	1	8	257	2	456	1,895
4:15 PM	0	4	1	2	0	24	0	5	0	0	140	11	3	9	279	3	481	1,935
4:30 PM	0	1	0	1	0	15	0	7	0	1	137	8	1	8	285	0	464	1,887
4:45 PM	0	0	2	3	0	15	0	5	2	2	129	14	1	13	307	1	494	1,880
5:00 PM	0	2	0	2	0	12	0	5	0	4	147	13	4	7	299	1	496	1,837
5:15 PM	0	3	0	2	0	9	0	5	0	1	104	6	0	6	297	0	433	
5:30 PM	0	3	1	0	0	12	0	3	0	2	136	8	0	8	284	0	457	
5:45 PM	0	1	0	2	0	8	0	6	3	0	144	7	0	8	271	1	451	
Count Total	0	15	5	12	0	110	0	50	5	11	1,077	83	10	67	2,279	8	3,732	
Peak Hour	0	7	3	8	0	66	0	22	2	7	553	46	9	37	1,170	5	1,935	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

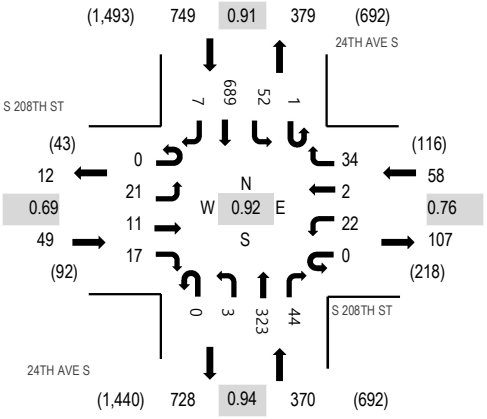
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	3	1	4	8	4:00 PM	6	3	3	2	14
4:15 PM	0	10	2	6	18	4:15 PM	4	0	2	2	8
4:30 PM	0	3	1	2	6	4:30 PM	5	0	0	0	5
4:45 PM	0	4	1	1	6	4:45 PM	4	6	5	1	16
5:00 PM	0	3	1	3	7	5:00 PM	3	2	0	0	5
5:15 PM	0	2	0	2	4	5:15 PM	1	0	1	0	2
5:30 PM	1	3	0	4	8	5:30 PM	4	1	0	3	8
5:45 PM	0	4	1	2	7	5:45 PM	1	0	1	0	2
Count Total	1	32	7	24	64	Count Total	28	12	12	8	60
Peak Hour	0	20	5	12	37	Peak Hour	16	8	7	3	34

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

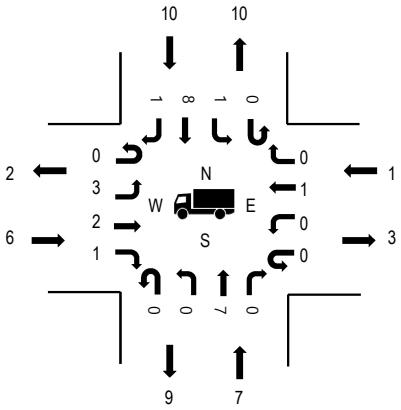
Location: 3 24TH AVE S & S 208TH ST PM
Date: Wednesday, October 12, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

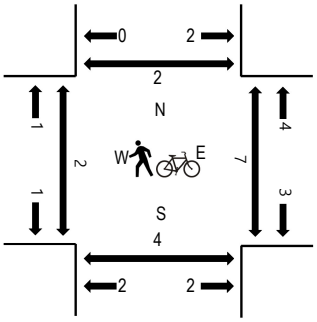
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	12.2%	0.69
WB	1.7%	0.76
NB	1.9%	0.94
SB	1.3%	0.91
All	2.0%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	S 208TH ST Eastbound				S 208TH ST Westbound				24TH AVE S Northbound				24TH AVE S Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	6	3	2	0	9	2	10	0	10	75	9	0	12	171	7	316	1,209
4:15 PM	0	4	5	9	0	6	1	5	0	3	78	14	0	10	165	0	300	1,226
4:30 PM	0	8	3	4	0	7	1	15	0	0	82	12	0	16	155	1	304	1,222
4:45 PM	0	3	0	3	0	6	0	8	0	0	75	8	0	8	175	3	289	1,208
5:00 PM	0	6	3	1	0	3	0	6	0	0	88	10	1	18	194	3	333	1,184
5:15 PM	0	5	0	0	0	4	1	8	0	1	58	11	0	11	195	2	296	
5:30 PM	0	6	3	11	0	3	0	9	0	0	63	17	0	15	160	3	290	
5:45 PM	0	3	2	2	0	5	0	7	0	3	63	12	0	16	150	2	265	
Count Total	0	41	19	32	0	43	5	68	0	17	582	93	1	106	1,365	21	2,393	
Peak Hour	0	21	11	17	0	22	2	34	0	3	323	44	1	52	689	7	1,226	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	2	0	3	7	4:00 PM	11	0	2	1	14
4:15 PM	1	1	1	3	6	4:15 PM	0	3	3	0	6
4:30 PM	4	3	0	2	9	4:30 PM	1	0	2	1	4
4:45 PM	0	1	0	3	4	4:45 PM	0	1	1	1	3
5:00 PM	1	2	0	2	5	5:00 PM	1	0	1	0	2
5:15 PM	2	2	2	1	7	5:15 PM	0	1	1	0	2
5:30 PM	0	0	0	2	2	5:30 PM	0	1	2	0	3
5:45 PM	2	1	1	0	4	5:45 PM	0	1	1	0	2
Count Total	12	12	4	16	44	Count Total	13	7	13	3	36
Peak Hour	6	7	1	10	24	Peak Hour	2	4	7	2	15

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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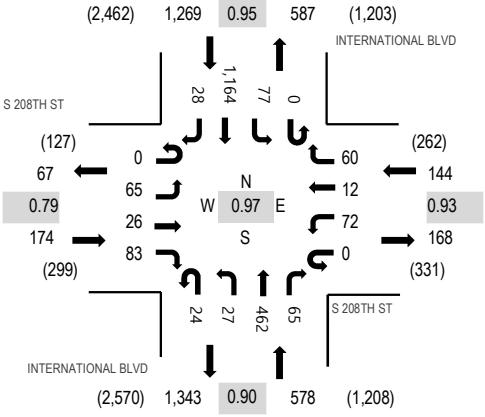
Location: 4 INTERNATIONAL BLVD & S 208TH ST PM
Date: Wednesday, October 12, 2022
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour

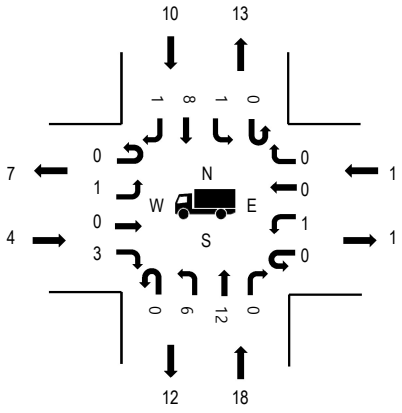
Motorized Vehicles



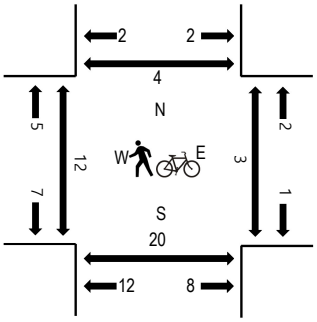
Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.79
WB	0.7%	0.93
NB	3.1%	0.90
SB	0.8%	0.95
All	1.5%	0.97

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	S 208TH ST Eastbound				S 208TH ST Westbound				INTERNATIONAL BLVD Northbound				INTERNATIONAL BLVD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	15	4	18	0	11	1	11	8	9	138	16	0	22	259	8	520	2,130
4:15 PM	0	8	7	10	0	14	1	11	7	5	125	17	0	10	290	7	512	2,154
4:30 PM	0	20	8	27	0	17	2	17	5	5	113	12	0	18	291	5	540	2,165
4:45 PM	0	11	6	20	0	15	4	13	7	9	124	16	0	23	302	8	558	2,135
5:00 PM	0	25	7	20	0	19	4	17	7	8	122	17	0	17	276	5	544	2,101
5:15 PM	0	9	5	16	0	21	2	13	5	5	103	20	0	19	295	10	523	
5:30 PM	0	15	9	12	0	14	3	23	7	5	113	16	0	21	267	5	510	
5:45 PM	0	13	3	11	0	18	1	10	7	6	134	17	0	21	274	9	524	
Count Total	0	116	49	134	0	129	18	115	53	52	972	131	0	151	2,254	57	4,231	
Peak Hour	0	65	26	83	0	72	12	60	24	27	462	65	0	77	1,164	28	2,165	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	2	0	4	8	4:00 PM	1	1	1	2	5
4:15 PM	1	11	3	6	21	4:15 PM	1	3	0	1	5
4:30 PM	2	3	1	2	8	4:30 PM	2	5	1	1	9
4:45 PM	1	6	0	1	8	4:45 PM	3	0	0	0	3
5:00 PM	0	6	0	5	11	5:00 PM	3	7	1	2	13
5:15 PM	1	3	0	2	6	5:15 PM	4	8	1	1	14
5:30 PM	1	2	0	3	6	5:30 PM	1	2	0	1	4
5:45 PM	3	4	0	3	10	5:45 PM	0	5	2	0	7
Count Total	11	37	4	26	78	Count Total	15	31	6	8	60
Peak Hour	4	18	1	10	33	Peak Hour	12	20	3	4	39

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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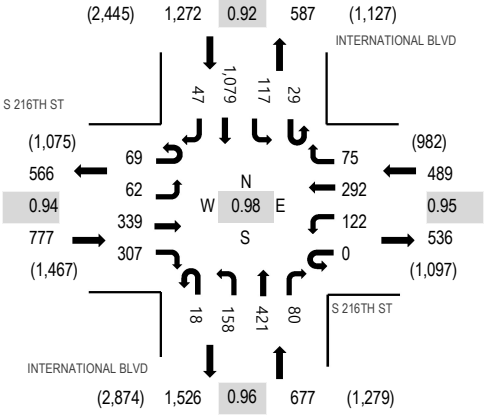
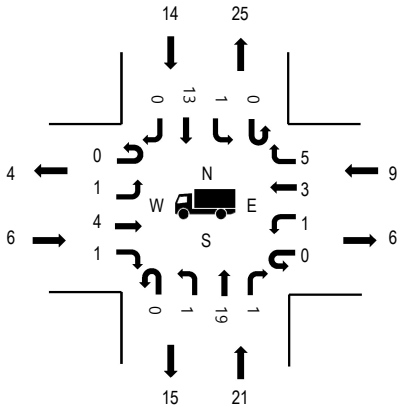
Location: 5 INTERNATIONAL BLVD & S 216TH ST PM
Date: Wednesday, October 12, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour

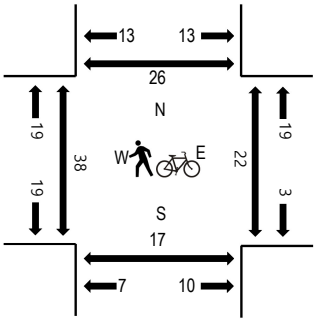
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.8%	0.94
WB	1.8%	0.95
NB	3.1%	0.96
SB	1.1%	0.92
All	1.6%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	S 216TH ST Eastbound				S 216TH ST Westbound				INTERNATIONAL BLVD Northbound				INTERNATIONAL BLVD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	18	14	89	77	0	24	85	17	3	41	105	22	10	32	200	6	743	3,160
4:15 PM	13	18	91	79	0	35	71	19	7	36	120	17	5	24	274	13	822	3,215
4:30 PM	23	11	78	66	0	23	78	19	3	44	108	26	7	31	251	16	784	3,106
4:45 PM	22	13	78	95	0	32	82	19	4	45	95	19	9	27	259	12	811	3,066
5:00 PM	11	20	92	67	0	32	61	18	4	33	98	18	8	35	295	6	798	3,013
5:15 PM	13	15	82	61	0	31	70	17	5	26	70	21	0	31	265	6	713	
5:30 PM	16	9	86	53	0	30	66	25	6	27	90	32	13	24	256	11	744	
5:45 PM	17	12	79	49	0	28	68	32	3	29	97	25	14	38	257	10	758	
Count Total	133	112	675	547	0	235	581	166	35	281	783	180	66	242	2,057	80	6,173	
Peak Hour	69	62	339	307	0	122	292	75	18	158	421	80	29	117	1,079	47	3,215	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	5	3	4	14	4:00 PM	4	5	0	5	14
4:15 PM	2	8	6	4	20	4:15 PM	15	5	8	7	35
4:30 PM	1	3	1	3	8	4:30 PM	3	5	4	6	18
4:45 PM	0	3	1	2	6	4:45 PM	14	4	6	9	33
5:00 PM	3	7	1	5	16	5:00 PM	6	3	4	4	17
5:15 PM	1	2	0	2	5	5:15 PM	9	4	4	7	24
5:30 PM	1	3	0	2	6	5:30 PM	8	6	10	3	27
5:45 PM	0	2	3	4	9	5:45 PM	5	4	5	7	21
Count Total	10	33	15	26	84	Count Total	64	36	41	48	189
Peak Hour	6	21	9	14	50	Peak Hour	38	17	22	26	103

Appendix B: LOS Definitions

Highway Capacity Manual 2010/6th Edition

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 2010* and 6th Edition (Transportation Research Board, 2010 and 2016, respectively).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop control. All-way stop control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F[1]	>50

Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Appendix C: LOS Worksheets

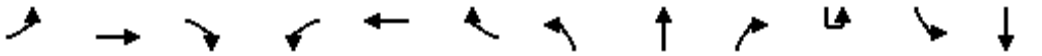
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	30	440	115	100	250	100	15	55	435	115	20	305
Future Volume (vph)	30	440	115	100	250	100	15	55	435	115	20	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	1.00	0.96		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.97		1.00	0.96			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1787	3442		1752	3319			1752	3505	1503		1787
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1787	3442		1752	3319			1752	3505	1503		1787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	31	458	120	104	260	104	16	57	453	120	21	318
RTOR Reduction (vph)	0	17	0	0	29	0	0	0	0	82	0	0
Lane Group Flow (vph)	31	561	0	104	335	0	0	73	453	38	0	339
Confl. Peds. (#/hr)	20		15	15		20		11		17		17
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	3%	3%	3%	3%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	4.9	30.1		12.8	38.0			9.0	43.8	43.8		30.8
Effective Green, g (s)	4.9	30.1		12.8	38.0			9.0	43.8	43.8		30.8
Actuated g/C Ratio	0.04	0.22		0.09	0.27			0.06	0.31	0.31		0.22
Clearance Time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Vehicle Extension (s)	2.0	2.0		3.5	2.0			2.0	3.0	3.0		3.0
Lane Grp Cap (vph)	62	740		160	900			112	1096	470		393
v/s Ratio Prot	0.02	c0.16		c0.06	0.10			0.04	0.13			c0.19
v/s Ratio Perm										0.02		
v/c Ratio	0.50	0.76		0.65	0.37			0.65	0.41	0.08		0.86
Uniform Delay, d1	66.3	51.5		61.4	41.3			64.0	38.0	33.9		52.6
Progression Factor	1.00	1.00		1.00	1.00			1.16	0.83	3.71		1.00
Incremental Delay, d2	2.3	4.0		9.5	0.1			9.8	1.1	0.3		17.4
Delay (s)	68.6	55.5		70.9	41.4			84.2	32.5	125.9		70.0
Level of Service	E	E		E	D			F	C	F		E
Approach Delay (s)		56.2			48.0				55.7			
Approach LOS		E			D				E			

Intersection Summary			
HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1015	60
Future Volume (vph)	1015	60
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.0	5.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.97
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3574	1550
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3574	1550
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1057	62
RTOR Reduction (vph)	0	33
Lane Group Flow (vph)	1057	30
Confl. Peds. (#/hr)		11
Heavy Vehicles (%)	1%	1%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	65.6	65.6
Effective Green, g (s)	65.6	65.6
Actuated g/C Ratio	0.47	0.47
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1674	726
v/s Ratio Prot	c0.30	
v/s Ratio Perm		0.02
v/c Ratio	0.63	0.04
Uniform Delay, d1	28.1	20.2
Progression Factor	1.00	1.00
Incremental Delay, d2	1.8	0.1
Delay (s)	29.9	20.3
Level of Service	C	C
Approach Delay (s)	38.8	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	5	10	65	0	20	10	555	45	10	35	1170
Future Volume (vph)	5	5	10	65	0	20	10	555	45	10	35	1170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95			1.00	0.95
Frpb, ped/bikes		1.00	0.98	1.00	0.98		1.00	1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	0.85		1.00	0.99			1.00	1.00
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1850	1576	1682	1499		1752	3452			1787	3574
Flt Permitted		0.87	1.00	0.75	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1644	1576	1330	1499		1752	3452			1787	3574
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	5	10	66	0	20	10	566	46	10	36	1194
RTOR Reduction (vph)	0	0	9	0	18	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	10	1	66	2	0	10	609	0	0	46	1194
Confl. Peds. (#/hr)	3		8	8		3	16		7		7	
Heavy Vehicles (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4		4	8								
Actuated Green, G (s)		11.4	11.4	10.9	10.9		1.6	104.7			7.9	111.0
Effective Green, g (s)		11.4	11.4	10.9	10.9		1.6	104.7			7.9	111.0
Actuated g/C Ratio		0.08	0.08	0.08	0.08		0.01	0.75			0.06	0.79
Clearance Time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Vehicle Extension (s)		4.0	4.0	3.0	3.0		3.0	4.0			3.0	4.0
Lane Grp Cap (vph)		133	128	103	116		20	2581			100	2833
v/s Ratio Prot					0.00		0.01	0.18			c0.03	c0.33
v/s Ratio Perm		0.01	0.00	c0.05								
v/c Ratio		0.08	0.01	0.64	0.01		0.50	0.24			0.46	0.42
Uniform Delay, d1		59.4	59.1	62.6	59.6		68.8	5.4			64.0	4.5
Progression Factor		1.00	1.00	1.00	1.00		1.08	0.90			0.66	3.35
Incremental Delay, d2		0.3	0.0	12.8	0.0		18.1	0.2			2.7	0.4
Delay (s)		59.8	59.1	75.5	59.6		92.2	5.1			45.0	15.5
Level of Service		E	E	E	E		F	A			D	B
Approach Delay (s)		59.4			71.8			6.5				16.5
Approach LOS		E			E			A				B

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1475
Flt Permitted	1.00
Satd. Flow (perm)	1475
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	5
RTOR Reduction (vph)	1
Lane Group Flow (vph)	4
Confl. Peds. (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	111.0
Effective Green, g (s)	111.0
Actuated g/C Ratio	0.79
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1169
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	3.0
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	3.0
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	15	20	5	35	5	325	45	55	690	5
Future Volume (veh/h)	20	10	15	20	5	35	5	325	45	55	690	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	22	11	16	22	5	38	5	353	49	60	750	5
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
Percent Heavy Veh, %	12	12	12	2	2	2	2	2	2	1	1	1
Cap, veh/h	301	70	101	323	21	156	7	1200	165	73	1531	10
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.00	0.38	0.38	0.04	0.42	0.42
Sat Flow, veh/h	1244	630	917	1370	186	1415	1781	3134	431	1795	3647	24
Grp Volume(v), veh/h	22	0	27	22	0	43	5	199	203	60	368	387
Grp Sat Flow(s),veh/h/ln	1244	0	1547	1370	0	1601	1781	1777	1788	1795	1791	1881
Q Serve(g_s), s	0.6	0.0	0.6	0.5	0.0	0.9	0.1	2.9	2.9	1.2	5.6	5.6
Cycle Q Clear(g_c), s	1.5	0.0	0.6	1.1	0.0	0.9	0.1	2.9	2.9	1.2	5.6	5.6
Prop In Lane	1.00		0.59	1.00		0.88	1.00		0.24	1.00		0.01
Lane Grp Cap(c), veh/h	301	0	171	323	0	177	7	681	685	73	752	789
V/C Ratio(X)	0.07	0.00	0.16	0.07	0.00	0.24	0.69	0.29	0.30	0.82	0.49	0.49
Avail Cap(c_a), veh/h	803	0	796	877	0	823	695	1870	1882	701	1885	1979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	0.0	15.0	15.5	0.0	15.1	18.5	8.0	8.0	17.7	7.9	7.9
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.1	0.0	0.7	61.8	0.3	0.3	15.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.2	0.0	0.3	0.2	0.8	0.9	0.7	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	15.4	15.6	0.0	15.8	80.3	8.3	8.3	32.7	8.6	8.5
LnGrp LOS	B	A	B	B	A	B	F	A	A	C	A	A
Approach Vol, veh/h		49			65			407			815	
Approach Delay, s/veh		15.6			15.7			9.2			10.3	
Approach LOS		B			B			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	20.1		10.0	5.7	21.5		10.0				
Change Period (Y+Rc), s	5.5	5.9		5.9	5.5	5.9		5.9				
Max Green Setting (Gmax), s	14.5	39.1		19.1	14.5	39.1		19.1				
Max Q Clear Time (g_c+I1), s	3.2	4.9		3.5	2.1	7.6		3.1				
Green Ext Time (p_c), s	0.1	3.7		0.1	0.0	7.7		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		10.4	
HCM 6th LOS		B	

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	65	25	85	70	10	60	25	25	460	65	75	1165
Future Volume (vph)	65	25	85	70	10	60	25	25	460	65	75	1165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97		1.00	0.98			1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.88		1.00	0.87			1.00	0.98		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1760	1594		1743	1613			1752	3426		1787	3574
Flt Permitted	0.71	1.00		0.58	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1316	1594		1067	1613			1752	3426		1787	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	67	26	88	72	10	62	26	26	474	67	77	1201
RTOR Reduction (vph)	0	79	0	0	56	0	0	0	5	0	0	0
Lane Group Flow (vph)	67	35	0	72	16	0	0	52	536	0	77	1201
Confl. Peds. (#/hr)	4		20	20		4		12		3	3	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	3%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)	13.7	13.7		13.7	13.7			8.3	97.5		12.3	101.5
Effective Green, g (s)	13.7	13.7		13.7	13.7			8.3	97.5		12.3	101.5
Actuated g/C Ratio	0.10	0.10		0.10	0.10			0.06	0.70		0.09	0.72
Clearance Time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0		4.0	4.0
Lane Grp Cap (vph)	128	155		104	157			103	2385		157	2591
v/s Ratio Prot		0.02			0.01			0.03	0.16		c0.04	c0.34
v/s Ratio Perm	0.05			c0.07								
v/c Ratio	0.52	0.22		0.69	0.10			0.50	0.22		0.49	0.46
Uniform Delay, d1	60.0	58.2		61.1	57.5			63.9	7.6		60.9	8.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.20	0.43
Incremental Delay, d2	3.8	0.7		18.1	0.3			3.9	0.2		3.1	0.6
Delay (s)	63.9	59.0		79.2	57.8			67.7	7.9		76.1	4.0
Level of Service	E	E		E	E			E	A		E	A
Approach Delay (s)		60.8			68.5				13.1			8.4
Approach LOS		E			E				B			A

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1498
Flt Permitted	1.00
Satd. Flow (perm)	1498
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	31
RTOR Reduction (vph)	9
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	12
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	101.5
Effective Green, g (s)	101.5
Actuated g/C Ratio	0.72
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1086
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.02
Uniform Delay, d1	5.4
Progression Factor	1.90
Incremental Delay, d2	0.0
Delay (s)	10.2
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	70	60	340	305	120	290	75	20	160	420	80	30
Future Volume (vph)	70	60	340	305	120	290	75	20	160	420	80	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00	0.95			1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97	1.00	0.99			1.00	1.00	0.93	
Flpb, ped/bikes		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	
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1787	1881	1550	1770	3401			1752	3505	1463	
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1787	1881	1550	1770	3401			1752	3505	1463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	61	347	311	122	296	77	20	163	429	82	31
RTOR Reduction (vph)	0	0	0	143	0	19	0	0	0	0	54	0
Lane Group Flow (vph)	0	132	347	168	122	354	0	0	183	429	28	0
Confl. Peds. (#/hr)		26		17	17		26		38		22	
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		15.0	31.3	31.3	14.5	30.8			18.3	43.7	43.7	
Effective Green, g (s)		15.0	31.3	31.3	14.5	30.8			18.3	43.7	43.7	
Actuated g/C Ratio		0.12	0.24	0.24	0.11	0.24			0.14	0.34	0.34	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Vehicle Extension (s)		3.5	4.0	4.0	3.5	4.0			3.5	4.0	4.0	
Lane Grp Cap (vph)		206	452	373	197	805			246	1178	491	
v/s Ratio Prot		c0.07	c0.18		0.07	0.10			c0.10	0.12		
v/s Ratio Perm				0.11							0.02	
v/c Ratio		0.64	0.77	0.45	0.62	0.44			0.74	0.36	0.06	
Uniform Delay, d1		54.9	46.0	42.0	55.1	42.2			53.6	32.6	29.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		6.9	8.1	1.2	6.0	0.5			11.9	0.9	0.2	
Delay (s)		61.9	54.1	43.2	61.1	42.8			65.5	33.5	29.4	
Level of Service		E	D	D	E	D			E	C	C	
Approach Delay (s)			51.1			47.3				41.5		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.7
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	115	1080	45
Future Volume (vph)	115	1080	45
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	6.0	6.7	6.7
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1502
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1502
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	117	1102	46
RTOR Reduction (vph)	0	0	31
Lane Group Flow (vph)	148	1102	15
Confl. Peds. (#/hr)	22		38
Heavy Vehicles (%)	1%	1%	1%
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	15.8	41.2	41.2
Effective Green, g (s)	15.8	41.2	41.2
Actuated g/C Ratio	0.12	0.32	0.32
Clearance Time (s)	6.0	6.7	6.7
Vehicle Extension (s)	3.5	4.0	4.0
Lane Grp Cap (vph)	217	1132	476
v/s Ratio Prot	0.08	c0.31	
v/s Ratio Perm			0.01
v/c Ratio	0.68	0.97	0.03
Uniform Delay, d1	54.7	43.9	30.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	8.8	21.1	0.1
Delay (s)	63.5	65.0	30.7
Level of Service	E	E	C
Approach Delay (s)		63.6	
Approach LOS		E	

Intersection Summary

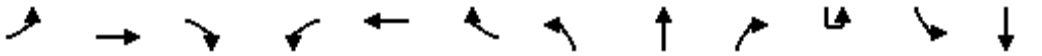
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	30	460	120	105	260	105	15	60	455	120	20	320
Future Volume (vph)	30	460	120	105	260	105	15	60	455	120	20	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	1.00	0.96		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.97		1.00	0.96			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1787	3442		1752	3319			1752	3505	1503		1787
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1787	3442		1752	3319			1752	3505	1503		1787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	31	479	125	109	271	109	16	62	474	125	21	333
RTOR Reduction (vph)	0	17	0	0	30	0	0	0	0	87	0	0
Lane Group Flow (vph)	31	587	0	109	350	0	0	79	474	38	0	354
Confl. Peds. (#/hr)	20		15	15		20		11		17		17
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	3%	3%	3%	3%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	4.9	31.0		12.7	38.8			10.7	42.1	42.1		31.7
Effective Green, g (s)	4.9	31.0		12.7	38.8			10.7	42.1	42.1		31.7
Actuated g/C Ratio	0.04	0.22		0.09	0.28			0.08	0.30	0.30		0.23
Clearance Time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Vehicle Extension (s)	2.0	2.0		3.5	2.0			2.0	3.0	3.0		3.0
Lane Grp Cap (vph)	62	762		158	919			133	1054	451		404
v/s Ratio Prot	0.02	c0.17		c0.06	0.11			0.05	0.14			c0.20
v/s Ratio Perm										0.03		
v/c Ratio	0.50	0.77		0.69	0.38			0.59	0.45	0.08		0.88
Uniform Delay, d1	66.3	51.2		61.7	40.9			62.5	39.6	35.1		52.3
Progression Factor	1.00	1.00		1.00	1.00			1.12	0.83	3.15		1.00
Incremental Delay, d2	2.3	4.4		12.3	0.1			4.6	1.4	0.4		18.7
Delay (s)	68.6	55.6		74.0	41.0			75.0	34.1	110.8		71.0
Level of Service	E	E		E	D			E	C	F		E
Approach Delay (s)		56.2			48.4				53.0			
Approach LOS		E			D				D			

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1065	65
Future Volume (vph)	1065	65
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.0	5.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.97
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3574	1550
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3574	1550
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1109	68
RTOR Reduction (vph)	0	37
Lane Group Flow (vph)	1109	31
Confl. Peds. (#/hr)		11
Heavy Vehicles (%)	1%	1%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	63.1	63.1
Effective Green, g (s)	63.1	63.1
Actuated g/C Ratio	0.45	0.45
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1610	698
v/s Ratio Prot	c0.31	
v/s Ratio Perm		0.02
v/c Ratio	0.69	0.04
Uniform Delay, d1	30.6	21.5
Progression Factor	1.00	1.00
Incremental Delay, d2	2.4	0.1
Delay (s)	33.1	21.7
Level of Service	C	C
Approach Delay (s)	41.3	
Approach LOS	D	

Intersection Summary



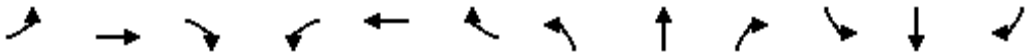
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	5	10	70	0	20	10	580	45	10	35	1225
Future Volume (vph)	5	5	10	70	0	20	10	580	45	10	35	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95			1.00	0.95
Frpb, ped/bikes		1.00	0.98	1.00	0.98		1.00	1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	0.85		1.00	0.99			1.00	1.00
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1850	1576	1682	1499		1752	3454			1787	3574
Flt Permitted		0.87	1.00	0.75	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1651	1576	1330	1499		1752	3454			1787	3574
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	5	10	71	0	20	10	592	46	10	36	1250
RTOR Reduction (vph)	0	0	9	0	18	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	10	1	71	2	0	10	635	0	0	46	1250
Confl. Peds. (#/hr)	3		8	8		3	16		7		7	
Heavy Vehicles (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4		4	8								
Actuated Green, G (s)		11.9	11.9	11.4	11.4		1.6	104.2			7.9	110.5
Effective Green, g (s)		11.9	11.9	11.4	11.4		1.6	104.2			7.9	110.5
Actuated g/C Ratio		0.09	0.09	0.08	0.08		0.01	0.74			0.06	0.79
Clearance Time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Vehicle Extension (s)		4.0	4.0	3.0	3.0		3.0	4.0			3.0	4.0
Lane Grp Cap (vph)		140	133	108	122		20	2570			100	2820
v/s Ratio Prot					0.00		0.01	0.18			c0.03	c0.35
v/s Ratio Perm		0.01	0.00	c0.05								
v/c Ratio		0.07	0.01	0.66	0.01		0.50	0.25			0.46	0.44
Uniform Delay, d1		59.0	58.6	62.4	59.1		68.8	5.6			64.0	4.8
Progression Factor		1.00	1.00	1.00	1.00		1.08	0.89			0.68	3.29
Incremental Delay, d2		0.3	0.0	13.5	0.0		18.0	0.2			2.5	0.4
Delay (s)		59.3	58.7	75.9	59.2		92.1	5.2			46.1	16.1
Level of Service		E	E	E	E		F	A			D	B
Approach Delay (s)		59.0			72.2			6.5				17.1
Approach LOS		E			E			A				B

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1475
Flt Permitted	1.00
Satd. Flow (perm)	1475
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	5
RTOR Reduction (vph)	1
Lane Group Flow (vph)	4
Confl. Peds. (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	110.5
Effective Green, g (s)	110.5
Actuated g/C Ratio	0.79
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1164
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	3.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	3.1
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	15	20	5	35	5	340	45	60	725	5
Future Volume (veh/h)	20	10	15	20	5	35	5	340	45	60	725	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	22	11	16	22	5	38	5	370	49	65	788	5
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
Percent Heavy Veh, %	12	12	12	2	2	2	2	2	2	1	1	1
Cap, veh/h	295	69	100	317	20	155	7	1233	162	80	1575	10
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.00	0.39	0.39	0.04	0.43	0.43
Sat Flow, veh/h	1244	630	917	1370	186	1414	1781	3154	414	1795	3649	23
Grp Volume(v), veh/h	22	0	27	22	0	43	5	207	212	65	387	406
Grp Sat Flow(s),veh/h/ln	1244	0	1547	1370	0	1600	1781	1777	1791	1795	1791	1881
Q Serve(g_s), s	0.6	0.0	0.6	0.6	0.0	0.9	0.1	3.1	3.1	1.4	6.0	6.0
Cycle Q Clear(g_c), s	1.6	0.0	0.6	1.2	0.0	0.9	0.1	3.1	3.1	1.4	6.0	6.0
Prop In Lane	1.00		0.59	1.00		0.88	1.00		0.23	1.00		0.01
Lane Grp Cap(c), veh/h	295	0	169	317	0	175	7	695	700	80	773	812
V/C Ratio(X)	0.07	0.00	0.16	0.07	0.00	0.25	0.69	0.30	0.30	0.81	0.50	0.50
Avail Cap(c_a), veh/h	784	0	777	856	0	804	679	1827	1842	685	1842	1934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	15.3	15.9	0.0	15.5	18.9	8.0	8.0	18.0	7.8	7.8
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.1	0.0	0.7	61.9	0.3	0.3	13.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.2	0.0	0.3	0.2	0.9	0.9	0.8	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	0.0	15.8	16.0	0.0	16.2	80.8	8.3	8.3	31.2	8.5	8.5
LnGrp LOS	B	A	B	B	A	B	F	A	A	C	A	A
Approach Vol, veh/h		49			65			424			858	
Approach Delay, s/veh		16.0			16.1			9.2			10.2	
Approach LOS		B			B			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	20.8		10.1	5.7	22.3		10.1				
Change Period (Y+Rc), s	5.5	5.9		5.9	5.5	5.9		5.9				
Max Green Setting (Gmax), s	14.5	39.1		19.1	14.5	39.1		19.1				
Max Q Clear Time (g_c+I1), s	3.4	5.1		3.6	2.1	8.0		3.2				
Green Ext Time (p_c), s	0.1	3.9		0.1	0.0	8.2		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		10.4
HCM 6th LOS		B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	70	25	90	75	10	65	25	25	480	70	80	1220
Future Volume (vph)	70	25	90	75	10	65	25	25	480	70	80	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97		1.00	0.98			1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.88		1.00	0.87			1.00	0.98		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1760	1591		1744	1610			1752	3424		1787	3574
Flt Permitted	0.71	1.00		0.57	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1310	1591		1042	1610			1752	3424		1787	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	26	93	77	10	67	26	26	495	72	82	1258
RTOR Reduction (vph)	0	83	0	0	60	0	0	0	6	0	0	0
Lane Group Flow (vph)	72	36	0	77	17	0	0	52	561	0	82	1258
Confl. Peds. (#/hr)	4		20	20		4		12		3	3	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	3%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)	14.4	14.4		14.4	14.4			8.3	96.4		12.7	100.8
Effective Green, g (s)	14.4	14.4		14.4	14.4			8.3	96.4		12.7	100.8
Actuated g/C Ratio	0.10	0.10		0.10	0.10			0.06	0.69		0.09	0.72
Clearance Time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0		4.0	4.0
Lane Grp Cap (vph)	134	163		107	165			103	2357		162	2573
v/s Ratio Prot		0.02			0.01			0.03	0.16		c0.05	c0.35
v/s Ratio Perm	0.05			c0.07								
v/c Ratio	0.54	0.22		0.72	0.10			0.50	0.24		0.51	0.49
Uniform Delay, d1	59.6	57.6		60.8	56.9			63.9	8.1		60.7	8.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.25	0.32
Incremental Delay, d2	4.1	0.7		20.6	0.3			3.9	0.2		3.2	0.6
Delay (s)	63.7	58.3		81.4	57.2			67.7	8.4		78.7	3.3
Level of Service	E	E		F	E			E	A		E	A
Approach Delay (s)		60.4			69.3				13.3			8.1
Approach LOS		E			E				B			A

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1498
Flt Permitted	1.00
Satd. Flow (perm)	1498
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	31
RTOR Reduction (vph)	9
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	12
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	100.8
Effective Green, g (s)	100.8
Actuated g/C Ratio	0.72
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1078
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.02
Uniform Delay, d1	5.6
Progression Factor	2.59
Incremental Delay, d2	0.0
Delay (s)	14.5
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	75	65	355	320	125	305	80	20	170	440	85	30
Future Volume (vph)	75	65	355	320	125	305	80	20	170	440	85	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00	0.95			1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97	1.00	0.99			1.00	1.00	0.93	
Flpb, ped/bikes		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	
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1787	1881	1550	1770	3400			1752	3505	1463	
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1787	1881	1550	1770	3400			1752	3505	1463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	77	66	362	327	128	311	82	20	173	449	87	31
RTOR Reduction (vph)	0	0	0	137	0	19	0	0	0	0	59	0
Lane Group Flow (vph)	0	143	362	190	128	374	0	0	193	449	28	0
Confl. Peds. (#/hr)		26		17	17		26		38		22	
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		15.5	32.0	32.0	14.8	31.3			19.0	42.4	42.4	
Effective Green, g (s)		15.5	32.0	32.0	14.8	31.3			19.0	42.4	42.4	
Actuated g/C Ratio		0.12	0.25	0.25	0.11	0.24			0.15	0.33	0.33	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Vehicle Extension (s)		3.5	4.0	4.0	3.5	4.0			3.5	4.0	4.0	
Lane Grp Cap (vph)		213	463	381	201	818			256	1143	477	
v/s Ratio Prot		c0.08	c0.19		0.07	0.11			c0.11	c0.13		
v/s Ratio Perm				0.12							0.02	
v/c Ratio		0.67	0.78	0.50	0.64	0.46			0.75	0.39	0.06	
Uniform Delay, d1		54.8	45.7	42.1	55.0	42.1			53.3	33.9	30.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		8.4	8.8	1.4	6.8	0.6			12.2	1.0	0.2	
Delay (s)		63.2	54.6	43.5	61.8	42.7			65.5	34.9	30.3	
Level of Service		E	D	D	E	D			E	C	C	
Approach Delay (s)			51.7			47.4				42.4		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	62.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.7
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	120	1130	45
Future Volume (vph)	120	1130	45
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	6.0	6.7	6.7
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1502
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1502
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	122	1153	46
RTOR Reduction (vph)	0	0	32
Lane Group Flow (vph)	153	1153	14
Confl. Peds. (#/hr)	22		38
Heavy Vehicles (%)	1%	1%	1%
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	16.1	39.5	39.5
Effective Green, g (s)	16.1	39.5	39.5
Actuated g/C Ratio	0.12	0.30	0.30
Clearance Time (s)	6.0	6.7	6.7
Vehicle Extension (s)	3.5	4.0	4.0
Lane Grp Cap (vph)	221	1085	456
v/s Ratio Prot	0.09	c0.32	
v/s Ratio Perm			0.01
v/c Ratio	0.69	1.06	0.03
Uniform Delay, d1	54.6	45.2	31.8
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	9.3	45.6	0.1
Delay (s)	63.9	90.9	31.9
Level of Service	E	F	C
Approach Delay (s)		85.8	
Approach LOS		F	

Intersection Summary

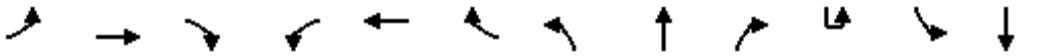
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	30	460	124	123	260	105	15	63	475	137	20	320
Future Volume (vph)	30	460	124	123	260	105	15	63	475	137	20	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	1.00	0.96		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.97		1.00	0.96			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1787	3439		1752	3319			1752	3505	1503		1787
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1787	3439		1752	3319			1752	3505	1503		1787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	31	479	129	128	271	109	16	66	495	143	21	333
RTOR Reduction (vph)	0	18	0	0	29	0	0	0	0	101	0	0
Lane Group Flow (vph)	31	590	0	128	351	0	0	82	495	42	0	354
Confl. Peds. (#/hr)	20		15	15		20		11		17		17
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	3%	3%	3%	3%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	4.9	31.1		13.8	40.0			10.9	40.9	40.9		31.7
Effective Green, g (s)	4.9	31.1		13.8	40.0			10.9	40.9	40.9		31.7
Actuated g/C Ratio	0.04	0.22		0.10	0.29			0.08	0.29	0.29		0.23
Clearance Time (s)	6.0	6.0		6.5	6.5			5.0	5.0	5.0		5.0
Vehicle Extension (s)	2.0	2.0		3.5	2.0			2.0	3.0	3.0		3.0
Lane Grp Cap (vph)	62	763		172	948			136	1023	439		404
v/s Ratio Prot	0.02	c0.17		c0.07	0.11			0.05	0.14			c0.20
v/s Ratio Perm										0.03		
v/c Ratio	0.50	0.77		0.74	0.37			0.60	0.48	0.10		0.88
Uniform Delay, d1	66.3	51.1		61.4	39.9			62.5	40.8	36.1		52.3
Progression Factor	1.00	1.00		1.00	1.00			1.08	0.80	1.92		1.00
Incremental Delay, d2	2.3	4.5		16.4	0.1			5.0	1.6	0.4		18.7
Delay (s)	68.6	55.6		77.8	40.0			72.5	34.4	69.7		71.0
Level of Service	E	E		E	D			E	C	E		E
Approach Delay (s)		56.2			49.5				45.7			
Approach LOS		E			D				D			

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1087	65
Future Volume (vph)	1087	65
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.0	5.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.97
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3574	1550
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3574	1550
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	1132	68
RTOR Reduction (vph)	0	38
Lane Group Flow (vph)	1132	30
Confl. Peds. (#/hr)		11
Heavy Vehicles (%)	1%	1%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	61.7	61.7
Effective Green, g (s)	61.7	61.7
Actuated g/C Ratio	0.44	0.44
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1575	683
v/s Ratio Prot	c0.32	
v/s Ratio Perm		0.02
v/c Ratio	0.72	0.04
Uniform Delay, d1	32.0	22.3
Progression Factor	1.00	1.00
Incremental Delay, d2	2.9	0.1
Delay (s)	34.9	22.4
Level of Service	C	C
Approach Delay (s)	42.6	
Approach LOS	D	

Intersection Summary



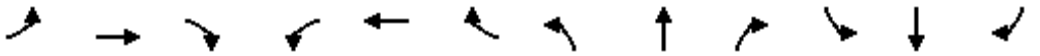
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	5	10	70	0	20	10	620	45	10	35	1269
Future Volume (vph)	5	5	10	70	0	20	10	620	45	10	35	1269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95			1.00	0.95
Frpb, ped/bikes		1.00	0.98	1.00	0.98		1.00	1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	0.85		1.00	0.99			1.00	1.00
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)		1850	1576	1682	1499		1752	3457			1787	3574
Flt Permitted		0.87	1.00	0.75	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)		1651	1576	1330	1499		1752	3457			1787	3574
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	5	10	71	0	20	10	633	46	10	36	1295
RTOR Reduction (vph)	0	0	9	0	18	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	10	1	71	2	0	10	677	0	0	46	1295
Confl. Peds. (#/hr)	3		8	8		3	16		7		7	
Heavy Vehicles (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4		4	8								
Actuated Green, G (s)		11.9	11.9	11.4	11.4		1.6	104.2			7.9	110.5
Effective Green, g (s)		11.9	11.9	11.4	11.4		1.6	104.2			7.9	110.5
Actuated g/C Ratio		0.09	0.09	0.08	0.08		0.01	0.74			0.06	0.79
Clearance Time (s)		6.0	6.0	6.5	6.5		5.0	5.0			5.0	5.0
Vehicle Extension (s)		4.0	4.0	3.0	3.0		3.0	4.0			3.0	4.0
Lane Grp Cap (vph)		140	133	108	122		20	2572			100	2820
v/s Ratio Prot					0.00		0.01	0.20			c0.03	c0.36
v/s Ratio Perm		0.01	0.00	c0.05								
v/c Ratio		0.07	0.01	0.66	0.01		0.50	0.26			0.46	0.46
Uniform Delay, d1		59.0	58.6	62.4	59.1		68.8	5.7			64.0	4.9
Progression Factor		1.00	1.00	1.00	1.00		1.04	0.87			0.69	3.31
Incremental Delay, d2		0.3	0.0	13.5	0.0		18.0	0.2			2.4	0.4
Delay (s)		59.3	58.7	75.9	59.2		89.5	5.2			46.6	16.5
Level of Service		E	E	E	E		F	A			D	B
Approach Delay (s)		59.0			72.2			6.4				17.5
Approach LOS		E			E			A				B

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.92
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1475
Flt Permitted	1.00
Satd. Flow (perm)	1475
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	5
RTOR Reduction (vph)	1
Lane Group Flow (vph)	4
Confl. Peds. (#/hr)	16
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	110.5
Effective Green, g (s)	110.5
Actuated g/C Ratio	0.79
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1164
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	3.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	3.1
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	15	20	5	35	5	340	52	60	725	5
Future Volume (veh/h)	20	10	15	20	5	35	5	340	52	60	725	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1722	1722	1722	1870	1870	1870	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	22	11	16	22	5	38	5	370	57	65	788	5
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
Percent Heavy Veh, %	12	12	12	2	2	2	2	2	2	1	1	1
Cap, veh/h	295	69	100	317	20	155	7	1206	184	80	1575	10
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.00	0.39	0.39	0.04	0.43	0.43
Sat Flow, veh/h	1244	630	917	1370	186	1414	1781	3086	471	1795	3649	23
Grp Volume(v), veh/h	22	0	27	22	0	43	5	212	215	65	387	406
Grp Sat Flow(s),veh/h/ln	1244	0	1547	1370	0	1600	1781	1777	1781	1795	1791	1881
Q Serve(g_s), s	0.6	0.0	0.6	0.6	0.0	0.9	0.1	3.1	3.2	1.4	6.0	6.0
Cycle Q Clear(g_c), s	1.6	0.0	0.6	1.2	0.0	0.9	0.1	3.1	3.2	1.4	6.0	6.0
Prop In Lane	1.00		0.59	1.00		0.88	1.00		0.26	1.00		0.01
Lane Grp Cap(c), veh/h	295	0	169	317	0	175	7	695	696	80	773	812
V/C Ratio(X)	0.07	0.00	0.16	0.07	0.00	0.25	0.69	0.30	0.31	0.81	0.50	0.50
Avail Cap(c_a), veh/h	784	0	777	856	0	804	679	1827	1831	685	1842	1934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	15.3	15.9	0.0	15.5	18.9	8.0	8.0	18.0	7.8	7.8
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.1	0.0	0.7	61.9	0.3	0.4	13.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.2	0.0	0.3	0.2	0.9	0.9	0.8	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	0.0	15.8	16.0	0.0	16.2	80.8	8.4	8.4	31.2	8.5	8.5
LnGrp LOS	B	A	B	B	A	B	F	A	A	C	A	A
Approach Vol, veh/h		49			65			432			858	
Approach Delay, s/veh		16.0			16.1			9.2			10.2	
Approach LOS		B			B			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	20.8		10.1	5.7	22.3		10.1				
Change Period (Y+Rc), s	5.5	5.9		5.9	5.5	5.9		5.9				
Max Green Setting (Gmax), s	14.5	39.1		19.1	14.5	39.1		19.1				
Max Q Clear Time (g_c+I1), s	3.4	5.2		3.6	2.1	8.0		3.2				
Green Ext Time (p_c), s	0.1	4.0		0.1	0.0	8.2		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		10.4
HCM 6th LOS		B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	70	25	97	75	10	65	63	25	520	70	80	1264
Future Volume (vph)	70	25	97	75	10	65	63	25	520	70	80	1264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.97		1.00	0.98			1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.88		1.00	0.87			1.00	0.98		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1760	1587		1744	1610			1752	3430		1787	3574
Flt Permitted	0.71	1.00		0.54	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1310	1587		992	1610			1752	3430		1787	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	26	100	77	10	67	65	26	536	72	82	1303
RTOR Reduction (vph)	0	75	0	0	60	0	0	0	5	0	0	0
Lane Group Flow (vph)	72	51	0	77	17	0	0	91	603	0	82	1303
Confl. Peds. (#/hr)	4		20	20		4		12		3	3	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	3%	1%	1%
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	NA
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Actuated Green, G (s)	14.6	14.6		14.6	14.6			12.6	96.2		12.7	96.3
Effective Green, g (s)	14.6	14.6		14.6	14.6			12.6	96.2		12.7	96.3
Actuated g/C Ratio	0.10	0.10		0.10	0.10			0.09	0.69		0.09	0.69
Clearance Time (s)	6.5	6.5		6.5	6.5			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0		4.0	4.0
Lane Grp Cap (vph)	136	165		103	167			157	2356		162	2458
v/s Ratio Prot		0.03			0.01			c0.05	0.18		0.05	c0.36
v/s Ratio Perm	0.05			c0.08								
v/c Ratio	0.53	0.31		0.75	0.10			0.58	0.26		0.51	0.53
Uniform Delay, d1	59.4	58.0		60.9	56.8			61.2	8.3		60.7	10.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.30	0.47
Incremental Delay, d2	3.7	1.1		25.2	0.3			5.1	0.3		3.1	0.8
Delay (s)	63.1	59.1		86.1	57.0			66.3	8.6		82.0	5.8
Level of Service	E	E		F	E			E	A		F	A
Approach Delay (s)		60.6			71.6				16.1			10.7
Approach LOS		E			E				B			B

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.94
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1498
Flt Permitted	1.00
Satd. Flow (perm)	1498
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	31
RTOR Reduction (vph)	10
Lane Group Flow (vph)	21
Confl. Peds. (#/hr)	12
Heavy Vehicles (%)	1%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	96.3
Effective Green, g (s)	96.3
Actuated g/C Ratio	0.69
Clearance Time (s)	5.0
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	1030
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.02
Uniform Delay, d1	6.9
Progression Factor	3.96
Incremental Delay, d2	0.0
Delay (s)	27.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	75	65	355	320	125	305	84	20	170	459	85	85
Future Volume (vph)	75	65	355	320	125	305	84	20	170	459	85	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Lane Util. Factor		1.00	1.00	1.00	1.00	0.95			1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97	1.00	0.99			1.00	1.00	0.93	
Flpb, ped/bikes		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	
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)		1787	1881	1550	1770	3394			1752	3505	1463	
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.95	1.00	1.00	
Satd. Flow (perm)		1787	1881	1550	1770	3394			1752	3505	1463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	77	66	362	327	128	311	86	20	173	468	87	87
RTOR Reduction (vph)	0	0	0	137	0	20	0	0	0	0	61	0
Lane Group Flow (vph)	0	143	362	190	128	377	0	0	193	468	26	0
Confl. Peds. (#/hr)		26		17	17		26		38		22	
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%	3%	1%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		15.5	32.0	32.0	14.8	31.3			19.0	39.4	39.4	
Effective Green, g (s)		15.5	32.0	32.0	14.8	31.3			19.0	39.4	39.4	
Actuated g/C Ratio		0.12	0.25	0.25	0.11	0.24			0.15	0.30	0.30	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0			6.0	6.7	6.7	
Vehicle Extension (s)		3.5	4.0	4.0	3.5	4.0			3.5	4.0	4.0	
Lane Grp Cap (vph)		213	463	381	201	817			256	1062	443	
v/s Ratio Prot		c0.08	c0.19		0.07	0.11			0.11	0.13		
v/s Ratio Perm				0.12							0.02	
v/c Ratio		0.67	0.78	0.50	0.64	0.46			0.75	0.44	0.06	
Uniform Delay, d1		54.8	45.7	42.1	55.0	42.1			53.3	36.4	32.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2		8.4	8.8	1.4	6.8	0.6			12.2	1.3	0.3	
Delay (s)		63.2	54.6	43.5	61.8	42.7			65.5	37.8	32.4	
Level of Service		E	D	D	E	D			E	D	C	
Approach Delay (s)			51.7			47.4				44.3		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	65.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	24.7
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	123	1147	52
Future Volume (vph)	123	1147	52
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	6.0	6.7	6.7
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1502
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1502
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	126	1170	53
RTOR Reduction (vph)	0	0	37
Lane Group Flow (vph)	213	1170	16
Confl. Peds. (#/hr)	22		38
Heavy Vehicles (%)	1%	1%	1%
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	19.1	39.5	39.5
Effective Green, g (s)	19.1	39.5	39.5
Actuated g/C Ratio	0.15	0.30	0.30
Clearance Time (s)	6.0	6.7	6.7
Vehicle Extension (s)	3.5	4.0	4.0
Lane Grp Cap (vph)	262	1085	456
v/s Ratio Prot	c0.12	c0.33	
v/s Ratio Perm			0.01
v/c Ratio	0.81	1.08	0.04
Uniform Delay, d1	53.7	45.2	31.8
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	17.7	51.0	0.1
Delay (s)	71.4	96.3	32.0
Level of Service	E	F	C
Approach Delay (s)		90.2	
Approach LOS		F	

Intersection Summary

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	116	0	668	1361	123
Future Vol, veh/h	0	116	0	668	1361	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	0	126	0	726	1479	134

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	807	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	-	-	-	-
Pot Cap-1 Maneuver	0	282	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	282	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.7	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	282	-	-
HCM Lane V/C Ratio	-	0.447	-	-
HCM Control Delay (s)	-	27.7	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	2.2	-	-

Appendix D: Trip Generation Study

LU	Size	Daily		AM Peak Hour					PM Peak Hour				
		Rate	Trips	Rate	% Inbound	In	Out	Total	Rate	% Inbound	In	Out	Total
Fast-Food Restaurant with Drive-Through (LU #934)	2,811 sf	467.48	1,314	44.61	51%	64	61	125	33.03	52%	48	45	93
Less Pass-by [1]		-53%	-690	-50%	50%	-31	-31	-62	-55%	50%	-26	-26	-52
Subtotal			**624**			**33**	**30**	**63**			**22**	**19**	**41**
Fast-Food Restaurant with Drive-Through (LU #934)	2,500 sf	467.48	1,169	44.61	51%	57	55	112	33.03	52%	43	40	83
Less Pass-by [1]		-53%	-614	-50%	50%	-28	-28	-56	-55%	50%	-23	-23	-46
Subtotal			**555**			**29**	**27**	**56**			**20**	**17**	**37**
Strip Retail Plaza (<40k) (LU #822)	9,550 sf	54.45	520	2.36	60%	14	9	23	6.59	50%	32	31	63
Subtotal			**520**			**14**	**9**	**23**			**32**	**31**	**63**
Total			***1,699***			***76***	***66***	***142***			***74***	***67***	***141***

Note: Trip generation rates based on ITE Trip Generation 11th Edition average rates. Pass-by rates from the ITE handbook