

MEMORANDUM

To: Steve Gomez, PE, PTOE, Senior Engineer - Traffic

From: Cassie Slade, PE, PTOE

Date: January 30, 2023

Project: Aurora One Innovus (Planning Area 5) in Aurora, Colorado

Subject: Detailed Traffic Study

The Fox Tuttle Transportation Group has completed a traffic analysis for the proposed development of Planning Area 5, called Innovus, within the Aurora One project in Aurora, Colorado. The 150-acre property is located on both sides of Stephen D. Hogan Parkway between Picadilly Road and E-470. It is understood that the entire project will have a mix of land uses including commercial retail/service, medical office, single-family attached residential, and multi-family residential. The entire Aurora One project area is bounded by Picadilly Road to the west, 6th Avenue to the north, Valdai Street to the east, and the Coal Creek to the south. Innovus (PA-5) is located in the northeast corner of Aurora One boundaries, south of 6th Avenue and between the existing Valdai Street and the new alignment of Valdai Street, as shown in **Figure 1**.

Innovus (PA-5) proposes to construct a 197,840 square foot office



Figure 1. Vicinity Map

building. The existing and future roadways and intersections have been planned or built to support Aurora One traffic including Innovus (PA-5). The master development includes realigning Valdai Street to connect to 6th Avenue approximately 670 feet west of the current intersection and constructing new internal roadways to provide connectivity for vehicular and multi-modal travel through Aurora One.

The purpose of this “detailed traffic study” is to compare the proposed Aurora One Innovus (PA-5) project to the trip generation assumptions as analyzed in the master traffic study and to determine if additional traffic analyses or improvements are necessary.

Comparison to the Master Traffic Study

A “Master” traffic impact study¹ (TIS) was previously prepared for the entire Aurora One development including Innovus (PA-5), as shown in **Figure 2**. The proposed roadways and intersections have been planned and will be built to support the full buildout traffic of Aurora One and other projects within the area. A review of the Aurora One TIS shows that Innovus (PA-5) included 150 apartments and 20,000 square feet of retail commercial. The current site plan includes 197,840 square feet of general office. Two of the proposed accesses will remain, two accesses will be closed, and one new access will be added, as shown in **Figure 2**.

It is not anticipated that this new access will create any issues with adjacent intersections due to the minimal volume on 6th Avenue.

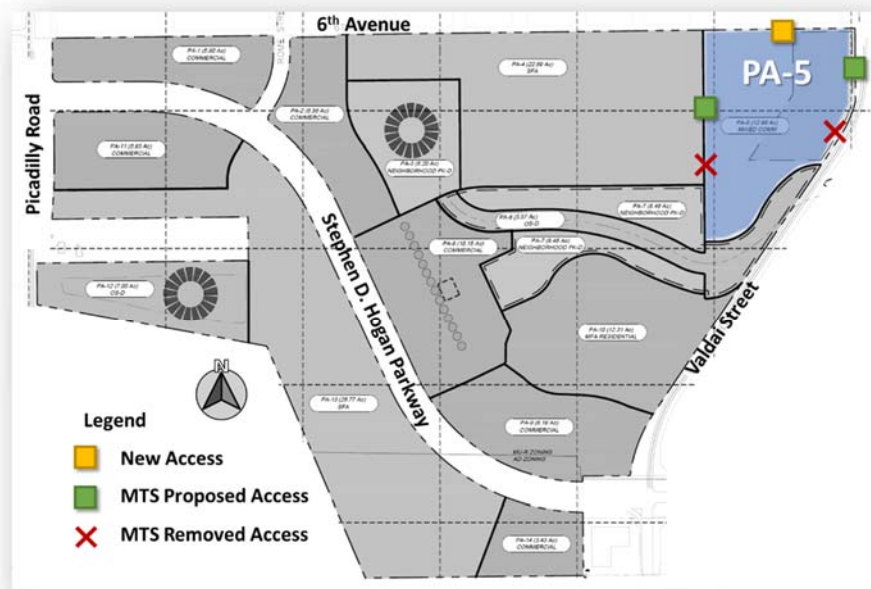


Figure 2. Proposed Innovus (PA-5) of Aurora One Map

¹ Aurora One Traffic Impact Study. Fox Tuttle Transportation Group, LLC. January 2021.

Trip Generation

To establish the volume of trips associated with the proposed Aurora One Innovus (PA-5) project, the data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Handbook and Manual* (10th Edition, Year 2017) was applied to the most applicable land use category. Although there is a newer version of the *Trip Generation Manual*, the previous version is the one utilized in the Master TIS and used in this analysis for comparison. The proposed land use is estimated to mostly be new trips, known as 'primary trips', and non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered "new" trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the number of trips made on a regional basis.

Non-Auto Trips. These trips are those that are completed by walking, biking, or transit. The future pedestrian and bicycle amenities will encourage residents, employees, customers, and visitors to make non-auto trips to/from the Aurora One community.

In the Aurora One TIS, it was assumed that there will 15% internal capture/non-auto reduction with the mix of land uses and connectivity to multi-modal facilities. For comparison purposes, the same percentage was applied to Innovus (PA-5). The estimated trip generation is summarized in **Table 1** for weekday daily, weekday AM, and weekday PM periods.

Table 1. Trip Generation Estimate and Comparison

Land Use	Size	Unit	Internal Capture	Non-Auto Factor	Average Daily New Trips				AM Peak Hour New Trips				PM Peak Hour New Trips			
					Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
Master Traffic Study																
ITE 221: Multi-Family Housing (Mid-Rise)	150	ksf	0.90	0.95	5.44	698	349	349	0.36	46	12	34	0.44	56	34	22
ITE 820: Shopping Center	20	ksf	0.90	0.95	37.75	646	323	323	0.94	16	10	6	3.81	65	31	34
Subtotal of Trips						1,344	672	672		62	22	40		121	65	56
Pass-by Trips: Shopping Center 34%						-220	-110	-110		0	0	0		-22	-11	-11
Subtotal of New Trips						1,124	562	562		62	22	40		99	54	45
Planning Area 5 - Updated Site Plan																
ITE 710: General Office Building	197.84	ksf	0.90	0.95	10.84	1,834	917	917	1.52	257	226	31	1.44	244	41	203
Change from Previous Land Use Assumptions						710	355	355	AM >	195	204	-9	PM >	145	-13	158
Percent Difference						63%			315%				146%			

Source: ITE Trip Generation 10th Edition, 2017. This is the version that was used in the Master Traffic Study.

Based on the comparison to the Aurora One TIS, **it was estimated that the latest site plan for Innovus (PA-5) would have a significant increase in trips during the weekday and during the peak hours.** The changes in trip volumes did not impact the recommendations from the Aurora One TIS or require additional improvements.

Traffic Operations

One existing study intersection and several proposed intersections were evaluated for delay and queuing at the anticipated buildout year of the project (assumed Year 2025) and full buildout of Aurora One (Year 2040). The following intersections were included in the Innovus (PA-5) analysis, and the numbering is consistent with the TIS:

- #4. Stephen D. Hogan Parkway and Valdai Street
- #111. Valdai Street and Old Valdai Street
- #113. Valdai Street and Access 13 (PA-4 & 5)
- #114. Valdai Street and 6th Avenue
- #124. Old Valdai Street and Access 23 (PA-5)
- #125. 6th Avenue and Access 25 (New PA-5 Access)

In Year 2025, it was assumed that internal roadways west of Valdai Street would not connect to Stephen D. Hogan Parkway until other Planning Areas are completed. Therefore, the Innovus (PA-5) trips that utilized those internal connections in the Aurora One TIS were redirected to Valdai Street via the left-turn from Stephen D. Hogan Parkway. Trip volumes for Year 2025 are shown on **Figure 3**. Innovus (PA-5) trip volumes for Year 2040 are shown on **Figure 4**.

Site-generated trips were added to the background Year 2025 volumes and are illustrated on **Figure 5**. The Year 2040 full buildout traffic volumes are shown on **Figure 6**. The necessary traffic control and lane configurations for the near-term and long-term scenarios are shown on the appropriate figures.

Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the Highway Capacity Manual (HCM)². Study intersections were evaluated using Synchro software (v11).

Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as “Level of Service” (LOS) that is defined by the HCM. LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D. Individual movements are allowed to fall to LOS E if traffic volume is low, or there is not a viable alternative. Criteria contained in the HCM was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the Appendix for reference.

Existing Conditions

The only existing study intersection is Stephen D. Hogan Parkway at Val dai Street. This side-street stop-controlled intersection was estimated to operate overall at LOS A in both peak hours. During the AM peak hour, the northbound and southbound left-turn movements were estimated to operate at LOS F with the 95th percentile queues up to four (4) vehicles. In the evening peak hour,

² Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 6th Edition (2016).

the southbound left-turn was estimated to operate at LOS E with one vehicle or less in the queue. No mitigation measures are recommended. Side-street volumes are not approaching signal warrant thresholds, as documented in the worksheets attached to this report.

Aurora One Innovus (PA-5) Buildout

It was assumed that Innovus (PA-5) will be completed and generating traffic by Year 2025. To estimate the background growth associated with Horizon (development project to the north) and other Aurora One planning areas. It was assumed that the traffic on Stephen D. Hogan Parkway will grow by an annual growth rate of 1.0%. It was assumed that 50% of Horizon was completed, 100% of Aurora One PA-4, and 25% of Aurora One PA-10 was completed.

Trips for Innovus (PA-5) were adjusted as discussed in the **Trip Generation Section** and the volumes were redistributed to remove two (2) accesses and include one (1) new access proposed on 6th Avenue, just east of Valdai Street. The Year 2025 traffic volumes are shown on **Figure 5**.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments.

All of the side-street stop-controlled intersections and accesses were calculated to operate overall at LOS A in both peak hours with all movements operating at LOS A or B. The 95th percentile queues were calculated to be one vehicle or less.

The intersection of **Stephen D. Hogan Parkway at Valdai Street** was estimated to operate overall at LOS D in the AM peak hour and LOS F in the PM peak hour. The northbound and southbound left-turn movements were calculated to operate at LOS F in both peak hours due to higher traffic on the arterial and turning movements of the side-street. The delay on the southbound left-turn was estimated to be greater than two minutes with the 95th percentile queue extending up to 370 feet (about 15 vehicles). Side-street volumes just meet a signal warrant threshold in the PM peak hour; therefore, the installation of a signal should be considered with by Year 2025. The signal warrant analysis is documented in the worksheets attached to this report.

Year 2040 Full Buildout of Aurora One

The full buildout volumes for Aurora One TIS were adjusted to account for the change from multi-family homes and retail to an office building in Innovus (PA-5). These adjusted trip volumes were redistributed to the appropriate accesses. The most current trip assignment for Planning Area 4 and 10 were updated as well. The background forecasts remained the same as estimated in the

TIS, as well as the future lane configurations and traffic control. The intersection of Stephen D. Hogan Parkway at Valdai Street is planned to be signalized in the future based on volumes and was assumed to be operational by Year 2040. The long-term full buildout traffic volumes are shown on **Figure 6**.

The results of the LOS calculations for the intersections are summarized in **Table 2** (attached to this letter). The details of queuing for each movement are provided in **Table 3** (attached to this letter). The intersection Level of Service worksheets are included in the attachments.

All of the study intersections were estimated to operate overall at LOS C or better in both peak hours with the majority of the movements operating at LOS D or better. Similar to the MTS, the eastbound approach at **Valdai Street at 6th Avenue** was estimated to operate at LOS E in the PM peak hour with a 95th percentile queue of up to 83 feet (about four vehicles). The 95th percentile queues at the other study intersections were calculated to be maintained within the proposed future storage lengths.

Auxiliary Lanes

The recommended auxiliary lanes and minimum storage lengths are presented in **Table 3**. It is understood that Valdai Street will include a center left-turn lane, therefore, each access for Innovus (PA-5) is recommended to include a minimum of 50 feet of storage for the left-turn pockets. The northbound left-turn at 6th Avenue is recommended to be a minimum of 90 feet to accommodate the estimated 95th percentile queue at full buildout of Aurora One. It should be noted that the new proposed access on 6th Avenue and the previously proposed access on Old Valdai Street will not need auxiliary lanes.

At the intersection of Stephen D. Hogan Parkway, the auxiliary lanes and storage lengths recommendations remained the same as the Aurora One TIS.

Pedestrian Connectivity

The City of Aurora requires that development project apply elements from their Traffic Calming Toolbox and countermeasures applicable from FHWA's *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (July 2018). It is recommended that pedestrian crossings be enhanced at the following locations with the listed features:

#4. Stephen D. Hogan Parkway and Valdai Street – crosswalks, pedestrian push buttons, pedestrian signals, adequate nighttime lighting levels, and reduced crossing distance were possible

#111. Valdai Street and Old Valdai Street – High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs. Consider curb extensions.

#113. Valdai Street and Access 13 (PA-4 & 5) – High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

#114. Valdai Street and 6th Avenue – High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs. Consider curb extensions.

Conclusions

It is anticipated that the existing and proposed roadway network, intersections, and accesses can accommodate the trips associated with Aurora One Innovus (PA-5) project, even with the change in land use type and increased peak hour trip volumes. Innovus (PA-5) changed the previously proposed apartments and retail space to an office building. As noted, the **proposed lane configurations, intersection traffic control, and access needs as presented in the Aurora One TIS are adequate, and thus the findings and recommendations of that study are still valid.** No additional traffic analysis is necessary to support this project.

I hope that the contents of this memorandum are helpful to you. If you have any questions, please feel free to give me a call.

Sincerely,

FOX TUTTLE TRANSPORTATION GROUP, LLC



Cassie Slade, P.E., PTOE
Principal



Attachments:

Table 2 – Peak Hour Intersection Level of Service Summary

Table 3 – Peak Hour Estimated 95th Percentile Queue Lengths

Figure 3 – Year 2025 Site-Generated Traffic Volumes

Figure 4 – Year 2040 Site-Generated Traffic Volumes

Figure 5 – Year 2025 Background + Site-Generated Traffic Volumes

Figure 6 – Year 2040 Background + Site-Generated Traffic Volumes

Intersection Capacity Analysis Worksheets

Signal Warrant Worksheets

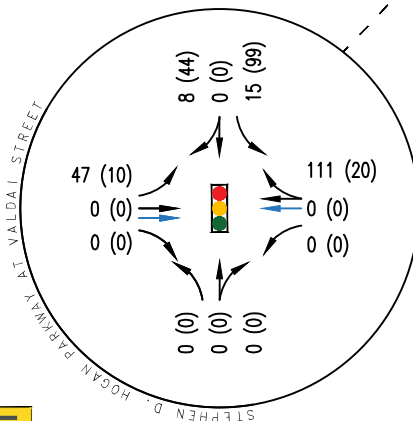
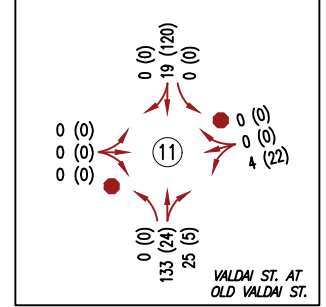
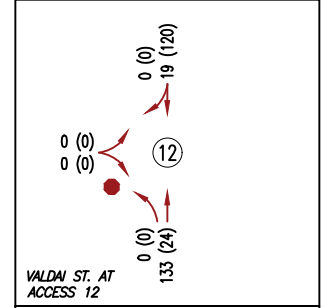
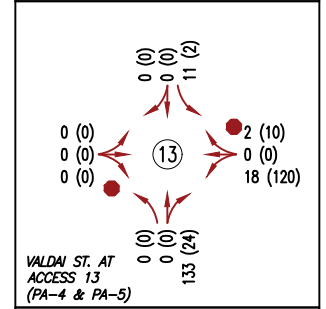
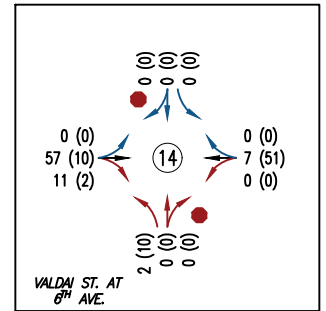
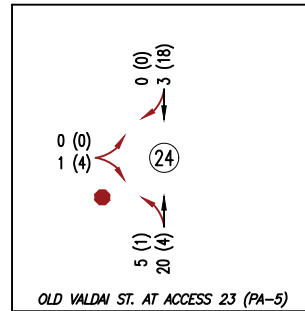
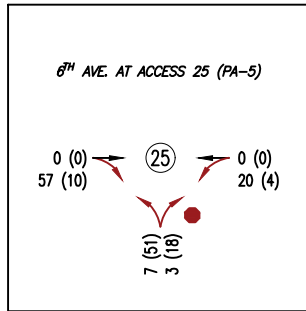
Table 2 - Peak Hour Intersection Level of Service Summary

Intersection and Critical Lane Groups	Existing				Year 2025 Bkgrd + Project				Year 2025 Bkgrd + Project (with Improvements)				2040 Bkgrd + Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
STOP SIGN CONTROL																
#4. Stephen D. Pkwy & Valdai St	8	A	4	A	29	D	54	F								
Eastbound Left	10	A	8	A	11	B	8	A	Analyzed with Signal		Analyzed with Signal		Analyzed with Signal		Analyzed with Signal	
Eastbound Through	0	A	0	A	0	A	0	A								
Eastbound Right	0	A	0	A	0	A	9	A								
Westbound Left	8	A	9	A	8	A	0	A								
Westbound Through+Right	0	A	0	A	0	A	0	A								
Northbound Left	74	F	31	D	102	F	50	F								
Northbound Through+Right	17	C	17	C	24	C	19	C								
Southbound Left	91	F	38	E	>120	F	>120	F								
Southbound Through+Right	23	C	13	B	23	C	13	B								
#111. Valdai Street & Old Valdai Street					1	A	2	A					2	A	2	A
Eastbound Left+Through+Right	Future Intersection				9	A	10	A	N/A				13	B	13	B
Westbound Left+Through+Right					11	B	12	B					21	C	33	D
Northbound Left					8	A	8	A					8	A	9	A
Northbound Through+Right					0	A	0	A					0	A	0	A
Southbound Left					0	A	0	A					0	A	0	A
Southbound Through+Right					0	A	0	A					0	A	0	A
#113. Valdai Street & Access 13 (PA 4 & 5)					1	A	5	A					1	A	4	A
Eastbound Left+Through+Right	Future Intersection				9	A	9	A	N/A				12	B	12	B
Westbound Left+Through+Right					10	B	10	B					17	C	33	D
Northbound Left					7	A	7	A					8	A	8	A
Northbound Through+Right					0	A	0	A					0	A	0	A
Southbound Left					8	A	7	A					8	A	9	A
Southbound Through+Right					0	A	0	A					0	A	0	A
#114. Valdai Street & 6th Avenue					7	A	7	A					6	A	8	A
Eastbound Left+Through+Right	Future Intersection				10	B	10	A	N/A				23	C	39	E
Westbound Left+Through+Right					10	A	10	B					13	B	27	D
Northbound Left					7	A	7	A					9	A	8	A
Northbound Through+Right					0	A	0	A					0	A	0	A
Southbound Left					7	A	7	A					8	A	8	A
Southbound Through+Right					0	A	0	A					0	A	0	A
#124. Old Valdai Street & Access 23 (PA 5)					1	A	1	A					1	A	1	A
Eastbound Left+Right	Future Intersection				8	A	9	A	N/A				8	A	9	A
Northbound Left+Through					7	A	7	A					7	A	7	A
Southbound Through+Right					0	A	0	A					0	A	0	A
#125. 6th Avenue & Access 25 (PA 5)					3	A	7	A					2	A	6	A
Eastbound Through+Right	Future Intersection				0	A	0	A	N/A				0	A	0	A
Westbound Left+Through					7	A	7	A					7	A	7	A
Northbound Left+Right					9	A	9	A					9	A	9	A
SIGNAL CONTROL																
#4. Stephen D. Pkwy & Valdai St									28	C	22	C	24	C	39	D
Eastbound Left	Refer to Stop Section				Refer to Stop Section				23	C	9	A	40	D	54	D
Eastbound Through									12	B	17	B	13	B	27	C
Eastbound Right									0	A	0	A	0	A	0	A
Westbound Left									8	A	12	B	10	B	26	C
Westbound Through+Right									33	C	13	B	23	C	52	D
Northbound Left									40	D	34	C	49	D	40	D
Northbound Through+Right									42	D	40	D				
Northbound Through													51	D	45	D
Northbound Right													49	D	52	D
Southbound Left									40	D	47	D	54	D	38	D
Southbound Through+Right									41	D	37	D				
Southbound Through													51	D	41	D
Southbound Right													0	A	0	A

Note: Delay represented in average seconds per vehicle.

Table 3 - Peak Hour Estimated 95th Percentile Queue Lengths

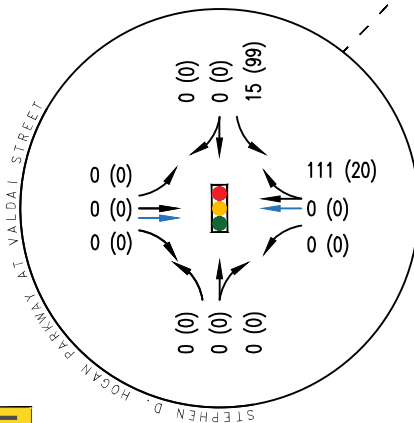
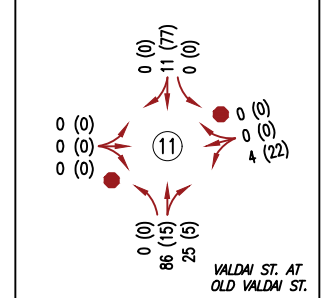
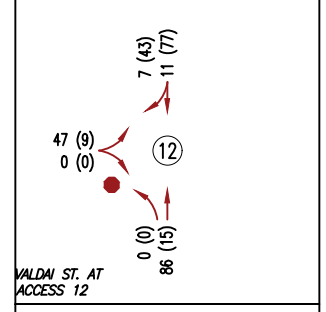
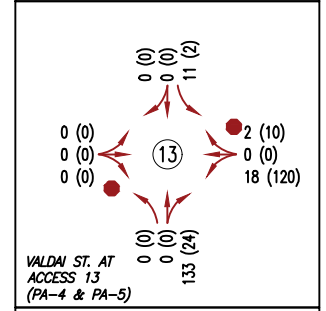
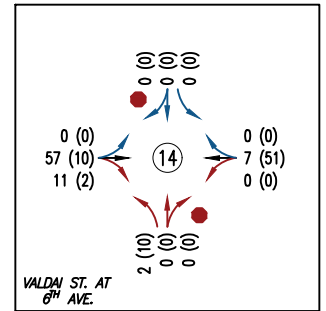
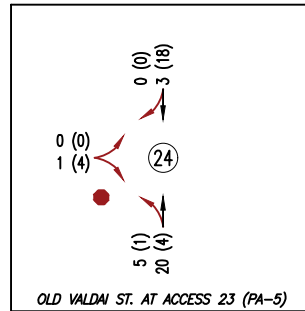
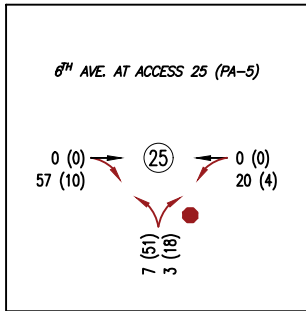
Intersection and Critical Lane Groups	Existing		2025 Bkgrd + Project		Year 2025 Bkgrd + Project (w/ Improvements)		2040 Bkgrd + Project		Max. Queue	CDOT SHAC Requirement (NR-B/NR-C) Storage + Taper				Proposed Minimum Future Storage
	AM	PM	AM	PM	AM	PM	AM	PM		Speed (mph)	Total (feet)	Storage (feet)	Taper (feet)	
#4. Stephen D. Pkwy & Valdai	Stop-Control (NB/SB)		Stop-Control (NB/SB)		Signalized		Signalized							
Eastbound Left	0'	3'	8'	3'	24'	20'	164'	276'	276'	40	370	226'	144	300'
Eastbound Through	0'	0'	0'	0'	192'	484'	174'	480'	-	-	-	-	-	-
Eastbound Right	0'	0'	0'	0'	0'	0'	23'	37'	37'	40	370	226'	144	226'
Westbound Left	5'	0'	5'	0'	26'	5'	30'	35'	35'	40	370	226'	144	226'
Westbound Through+Right	0'	0'	0'	0'	822'	222'	681'	391'	-	-	-	-	-	-
Northbound Left	23'	20'	30'	30'	17'	24'	129'	146'	146'	30	250	154'	96	154'
Northbound Through+Right	10'	20'	15'	25'	15'	12'			-	-	-	-	-	-
Northbound Through							23'	49'	-	-	-	-	-	-
Northbound Right							4'	48'	-	-	-	-	-	-
Southbound Left	85'	23'	228'	370'	97'	183'	249'	264'	370'	30	250	154'	96	370'
Southbound Through+Right	45'	8'	25'	15'	40'	42'			-	-	-	-	-	-
Southbound Through							27'	41'	-	-	-	-	-	-
Southbound Right							0'	0'	-	-	-	-	-	-
#111. Valdai Street & Old Valdai Street			Stop-Control (EB/WB)		N/A		Stop-Control (EB/WB)							
Eastbound Left+Through+Right	Future Intersection		3'	0'			10'	8'	-	-	-	-	-	-
Westbound Left+Through+Right			3'	5'			5'	8'	-	-	-	-	-	-
Northbound Left			0'	0'			3'	5'	5'	30	250	154'	96	154'
Northbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
Southbound Left			0'	0'			0'	0'	0'	30	250	154'	96	154'
Southbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
#113. Valdai Street & Access 13 (PA 4 & 5)			Stop-Control (EB/WB)		N/A		Stop-Control (EB/WB)							
Eastbound Left+Through+Right	Future Intersection		0'	0'			3'	0'	-	-	-	-	-	-
Westbound Left+Through+Right			3'	15'			5'	100'	-	-	-	-	-	-
Northbound Left			0'	0'			0'	0'	0'	30	250	154'	96	154'
Northbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
Southbound Left			0'	0'			0'	0'	0'	30	250	154'	96	154'
Southbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
#114. Valdai Street & 6th Avenue			Stop-Control (NB/SB)		N/A		Stop-Control (NB/SB)							
Eastbound Left+Through+Right	Future Intersection		15'	8'			63'	83'	-	-	-	-	-	-
Westbound Left+Through+Right			3'	8'			3'	28'	-	-	-	-	-	-
Northbound Left			3'	3'			8'	10'	10'	30	250	154'	96	154'
Northbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
Southbound Left			0'	0'			0'	0'	0'	30	250	154'	96	154'
Southbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
#124. Old Valdai Street & Access 23 (PA 5)			Stop-Control (EB)		N/A		Stop-Control (EB)							
Eastbound Left+Right	Future Intersection		0'	0'			0'	0'	-	-	-	-	-	-
Northbound Left+Through			0'	0'			0'	0'	-	-	-	-	-	-
Southbound Through+Right			0'	0'			0'	0'	-	-	-	-	-	-
#125. 6th Avenue & Access 25 (PA 5)			Stop-Control (NB)		N/A		Stop-Control (NB)							
Eastbound Through+Right	Future Intersection		0'	0'			0'	0'	-	-	-	-	-	-
Westbound Left+Through			0'	0'			0'	0'	-	-	-	-	-	-
Northbound Left+Right			0'	5'			0'	5'	-	-	-	-	-	-



KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER

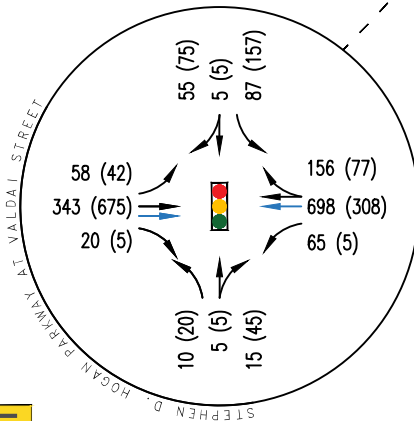
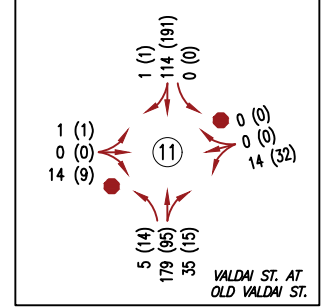
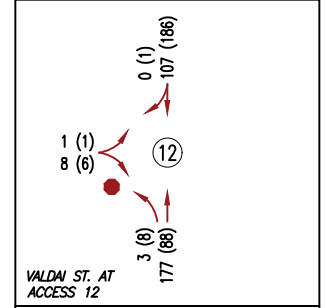
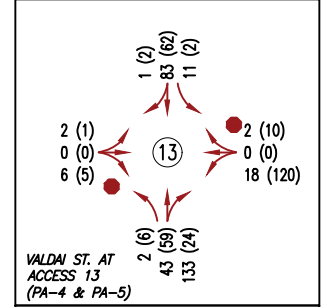
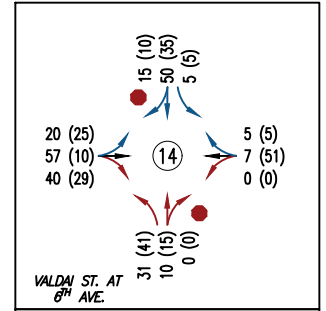
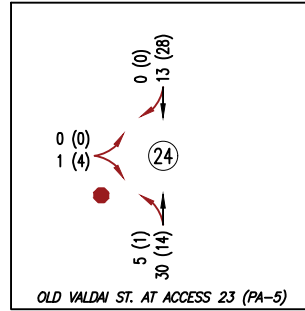
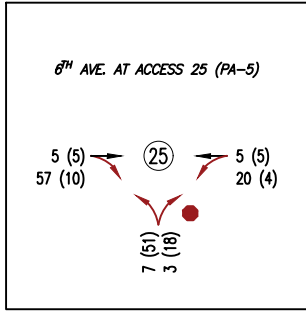




KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER

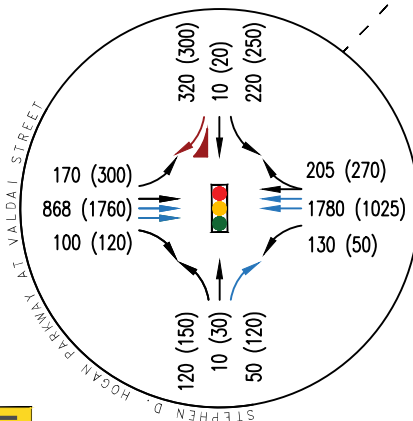
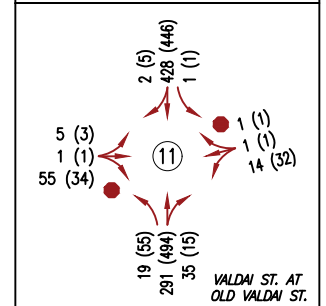
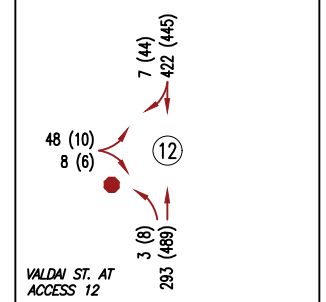
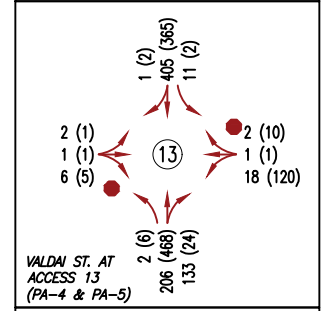
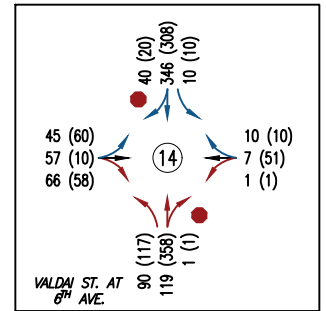
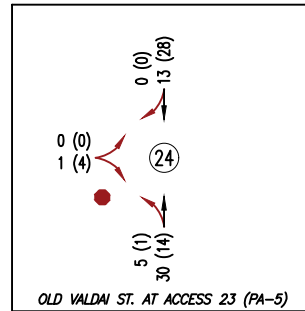
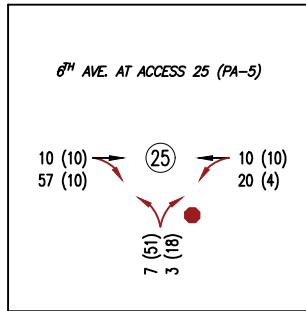




KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER














KEY

- XX (XX) AM (PM) PEAK HOUR TRIPS
- EXISTING LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL
- PROPOSED PROJECT ROADWAY NETWORK
- # ACCESS INTERSECTION ID NUMBER



Intersection												
Int Delay, s/veh	28.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	343	20	65	698	156	10	5	15	87	5	55
Future Vol, veh/h	58	343	20	65	698	156	10	5	15	87	5	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	275	-	225	225	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	55	55	55	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	404	24	76	821	184	18	9	27	102	6	65

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1005	0	0	404	0	0	1641	1697	404	1623	1605	913
Stage 1	-	-	-	-	-	-	540	540	-	1065	1065	-
Stage 2	-	-	-	-	-	-	1101	1157	-	558	540	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	689	-	-	1155	-	-	80	92	647	~ 82	105	331
Stage 1	-	-	-	-	-	-	526	521	-	269	299	-
Stage 2	-	-	-	-	-	-	257	271	-	514	521	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	689	-	-	1155	-	-	54	77	647	~ 63	88	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	77	-	~ 63	88	-
Stage 1	-	-	-	-	-	-	474	469	-	242	279	-
Stage 2	-	-	-	-	-	-	189	253	-	435	469	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.6	50.1	276.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	54	227	689	-	-	1155	-	-	63	269
HCM Lane V/C Ratio	0.337	0.16	0.099	-	-	0.066	-	-	1.625	0.262
HCM Control Delay (s)	102.4	23.9	10.8	-	-	8.3	-	-	\$ 450.7	23.1
HCM Lane LOS	F	C	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	1.2	0.6	0.3	-	-	0.2	-	-	9.1	1

Notes												
~: Volume exceeds capacity			\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon			

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	0	14	14	0	0	5	179	35	0	114	1
Future Vol, veh/h	1	0	14	14	0	0	5	179	35	0	114	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	15	15	0	0	5	195	38	0	124	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	349	368	125	356	349	214	125	0	0	233	0	0
Stage 1	125	125	-	224	224	-	-	-	-	-	-	-
Stage 2	224	243	-	132	125	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	606	561	926	599	575	826	1462	-	-	1335	-	-
Stage 1	879	792	-	779	718	-	-	-	-	-	-	-
Stage 2	779	705	-	871	792	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	604	559	926	588	573	826	1462	-	-	1335	-	-
Mov Cap-2 Maneuver	604	559	-	588	573	-	-	-	-	-	-	-
Stage 1	876	792	-	777	716	-	-	-	-	-	-	-
Stage 2	776	703	-	857	792	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	11.3	0.2	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1462	-	-	894 588	1335	-	-
HCM Lane V/C Ratio	0.004	-	-	0.018 0.026	-	-	-
HCM Control Delay (s)	7.5	-	-	9.1 11.3	0	-	-
HCM Lane LOS	A	-	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.1	0	-	-

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	0	6	18	0	2	2	43	133	11	83	1
Future Vol, veh/h	2	0	6	18	0	2	2	43	133	11	83	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	7	20	0	2	2	47	145	12	90	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	240	311	91	242	239	120	91	0	0	192	0	0
Stage 1	115	115	-	124	124	-	-	-	-	-	-	-
Stage 2	125	196	-	118	115	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	714	604	967	712	662	931	1504	-	-	1381	-	-
Stage 1	890	800	-	880	793	-	-	-	-	-	-	-
Stage 2	879	739	-	887	800	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	707	598	967	702	655	931	1504	-	-	1381	-	-
Mov Cap-2 Maneuver	707	598	-	702	655	-	-	-	-	-	-	-
Stage 1	889	793	-	879	792	-	-	-	-	-	-	-
Stage 2	876	738	-	873	793	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	10.2	0.1	0.9
HCM LOS	A	B		




Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	886	720	1381	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.03	0.009	-
HCM Control Delay (s)	7.4	-	-	9.1	10.2	7.6	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	20	57	40	1	7	5	31	10	1	1	50	15
Future Vol, veh/h	20	57	40	1	7	5	31	10	1	1	50	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	62	43	1	8	5	34	11	1	1	54	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	150	144	62	197	152	12	70	0	0	12	0	0
Stage 1	64	64	-	80	80	-	-	-	-	-	-	-
Stage 2	86	80	-	117	72	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	818	747	1003	762	740	1069	1531	-	-	1607	-	-
Stage 1	947	842	-	929	828	-	-	-	-	-	-	-
Stage 2	922	828	-	888	835	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	793	730	1003	670	723	1069	1531	-	-	1607	-	-
Mov Cap-2 Maneuver	793	730	-	670	723	-	-	-	-	-	-	-
Stage 1	926	841	-	909	810	-	-	-	-	-	-	-
Stage 2	889	810	-	786	834	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		9.5		5.5		0.1	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1531	-	-	817	820	1607	-
HCM Lane V/C Ratio	0.022	-	-	0.156	0.017	0.001	-
HCM Control Delay (s)	7.4	-	-	10.2	9.5	7.2	-
HCM Lane LOS	A	-	-	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	5	30	13	0
Future Vol, veh/h	0	1	5	30	13	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	1	5	33	14	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	57	14	14	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	950	1066	1604	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	947	1066	1604	-	-	-
Mov Cap-2 Maneuver	947	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1604	-	1066	-	-
HCM Lane V/C Ratio	0.003	-	0.001	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Vol, veh/h	2	57	20	6	7	3
Future Vol, veh/h	2	57	20	6	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	2	2	2	2	2	2
Mvmt Flow	2	62	22	7	8	3



















Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	64	0	84	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	51	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1538	-	918	1041
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	971	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1538	-	905	1041
Mov Cap-2 Maneuver	-	-	-	-	905	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	942	-	-	1538	-
HCM Lane V/C Ratio	0.012	-	-	0.014	-
HCM Control Delay (s)	8.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Timings
01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy
2025 Bkgrd + Project (with Improvements) - AM Peak Hour

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	58	343	20	65	698	10	5	87	5
Future Volume (vph)	58	343	20	65	698	10	5	87	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2		1	6	7	4	3	8
Permitted Phases	2		2	6		4		8	
Detector Phase	5	2	2	1	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	10.0	28.0	10.0	28.0
Total Split (s)	10.0	52.0	52.0	10.0	52.0	10.0	28.0	10.0	28.0
Total Split (%)	10.0%	52.0%	52.0%	10.0%	52.0%	10.0%	28.0%	10.0%	28.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None

Intersection Summary

Cycle Length: 100

















Actuated Cycle Length: 100










Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 4: Valdai Street & Stephen D Hogan Pkwy

							
Ø1	Ø2 (R)		Ø3	Ø4		Ø5	Ø6 (R)
10 s	52 s		10 s	28 s		10 s	28 s
							
Ø5	Ø6 (R)		Ø7	Ø8		Ø9	Ø10 (R)
10 s	52 s		10 s	28 s		10 s	28 s

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	404	24	76	1005	18	36	102	71
v/c Ratio	0.31	0.33	0.02	0.11	0.83	0.10	0.19	0.57	0.28
Control Delay	9.0	11.3	0.1	5.1	25.4	33.8	22.4	49.3	15.7
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0
Total Delay	9.0	11.3	0.1	5.1	27.0	33.8	22.4	49.3	15.7
Queue Length 50th (ft)	12	136	0	14	581	9	5	55	3
Queue Length 95th (ft)	24	192	0	26	#822	17	15	97	40
Internal Link Dist (ft)		350			557		352		320
Turn Bay Length (ft)	275		225	225		100		100	
Base Capacity (vph)	216	1243	1103	701	1216	176	384	180	404
Starvation Cap Reductn	0	0	0	0	88	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.33	0.02	0.11	0.89	0.10	0.09	0.57	0.18

Intersection Summary























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

HCM 6th Signalized Intersection Summary

01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy

2025 Bkgd + Project (with Improvements) - AM Peak Hour










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	343	20	65	698	156	10	5	15	87	5	55
Future Volume (veh/h)	58	343	20	65	698	156	10	5	15	87	5	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	404	0	76	821	184	18	9	27	102	6	65
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.55	0.55	0.55	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	1102		617	874	196	222	40	120	266	17	187
Arrive On Green	0.04	0.59	0.00	0.04	0.59	0.59	0.02	0.10	0.10	0.05	0.13	0.13
Sat Flow, veh/h	1781	1870	1585	1781	1479	332	1781	412	1236	1781	136	1470
Grp Volume(v), veh/h	68	404	0	76	0	1005	18	0	36	102	0	71
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	0	1648	1781	0	1606
Q Serve(g_s), s	1.5	11.3	0.0	1.6	0.0	51.1	0.9	0.0	2.0	5.0	0.0	4.0
Cycle Q Clear(g_c), s	1.5	11.3	0.0	1.6	0.0	51.1	0.9	0.0	2.0	5.0	0.0	4.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.75	1.00		0.92
Lane Grp Cap(c), veh/h	192	1102		617	0	1070	222	0	160	266	0	204
V/C Ratio(X)	0.35	0.37		0.12	0.00	0.94	0.08	0.00	0.23	0.38	0.00	0.35
Avail Cap(c_a), veh/h	206	1102		628	0	1070	277	0	363	266	0	353
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	1.00	0.00	0.83	0.00	0.83	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	10.8	0.0	7.7	0.0	18.8	39.4	0.0	41.7	38.7	0.0	39.8
Incr Delay (d2), s/veh	1.1	0.9	0.0	0.1	0.0	14.3	0.2	0.0	0.7	0.9	0.0	1.0
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	0.9	4.3	0.0	0.5	0.0	21.9	0.4	0.0	0.8	2.3	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	11.7	0.0	7.8	0.0	33.1	39.6	0.0	42.4	39.6	0.0	40.9
LnGrp LOS	C	B		A	A	C	D	A	D	D	A	D
Approach Vol, veh/h		472			1081			54			173	
Approach Delay, s/veh		13.3			31.3			41.5			40.1	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	64.9	10.0	15.7	9.2	65.1	7.0	18.7				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	5.0	46.0	5.0	22.0	5.0	46.0	5.0	22.0				
Max Q Clear Time (g_c+I1), s	3.6	13.3	7.0	4.0	3.5	53.1	2.9	6.0				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.1	0.0	0.0	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	54.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	675	5	5	308	77	20	5	45	157	5	75
Future Vol, veh/h	42	675	5	5	308	77	20	5	45	157	5	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	275	-	225	225	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	55	55	55	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	750	6	6	342	86	36	9	82	185	6	88
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	428	0	0	750	0	0	1288	1284	750	1287	1241	385
Stage 1	-	-	-	-	-	-	844	844	-	397	397	-
Stage 2	-	-	-	-	-	-	444	440	-	890	844	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1131	-	-	859	-	-	141	165	411	~ 141	175	663
Stage 1	-	-	-	-	-	-	358	379	-	629	603	-
Stage 2	-	-	-	-	-	-	593	578	-	337	379	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	859	-	-	115	157	411	~ 104	166	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	115	157	-	~ 104	166	-
Stage 1	-	-	-	-	-	-	343	363	-	603	599	-
Stage 2	-	-	-	-	-	-	505	574	-	252	363	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.1			27.6			\$ 306		
HCM LOS							D			F		
Minor Lane/Major Mvmt	NBLn1 NBLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	115	354	1131	-	-	859	-	-	104	558		
HCM Lane V/C Ratio	0.316	0.257	0.041	-	-	0.006	-	-	1.776	0.169		
HCM Control Delay (s)	50.2	18.6	8.3	-	-	9.2	-	-	\$ 455.4	12.8		
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B		
HCM 95th %tile Q(veh)	1.2	1	0.1	-	-	0	-	-	14.8	0.6		
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	1	0	9	32	0	0	14	95	15	0	191	1
Future Vol, veh/h	1	0	9	32	0	0	14	95	15	0	191	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	10	35	0	0	15	103	16	0	208	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	350	358	209	355	350	111	209	0	0	119	0	0
Stage 1	209	209	-	141	141	-	-	-	-	-	-	-
Stage 2	141	149	-	214	209	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	605	568	831	600	574	942	1362	-	-	1469	-	-
Stage 1	793	729	-	862	780	-	-	-	-	-	-	-
Stage 2	862	774	-	788	729	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	600	562	831	588	568	942	1362	-	-	1469	-	-
Mov Cap-2 Maneuver	600	562	-	588	568	-	-	-	-	-	-	-
Stage 1	784	729	-	853	771	-	-	-	-	-	-	-
Stage 2	853	765	-	779	729	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	11.5	0.9	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1362	-	-	800	588	1469	-
HCM Lane V/C Ratio	0.011	-	-	0.014	0.059	-	-
HCM Control Delay (s)	7.7	-	-	9.6	11.5	0	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	0	5	120	0	10	6	59	24	2	62	2
Future Vol, veh/h	1	0	5	120	0	10	6	59	24	2	62	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	5	130	0	11	7	64	26	2	67	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	169	176	68	166	164	77	69	0	0	90	0	0
Stage 1	72	72	-	91	91	-	-	-	-	-	-	-
Stage 2	97	104	-	75	73	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	795	717	995	798	729	984	1532	-	-	1505	-	-
Stage 1	938	835	-	916	820	-	-	-	-	-	-	-
Stage 2	910	809	-	934	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	783	713	995	790	725	984	1532	-	-	1505	-	-
Mov Cap-2 Maneuver	783	713	-	790	725	-	-	-	-	-	-	-
Stage 1	933	834	-	911	816	-	-	-	-	-	-	-
Stage 2	896	805	-	928	833	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.8		10.4		0.5		0.2	
HCM LOS	A		B					




Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1532	-	-	952 802	1505	-	-
HCM Lane V/C Ratio	0.004	-	-	0.007 0.176	0.001	-	-
HCM Control Delay (s)	7.4	-	-	8.8 10.4	7.4	-	-
HCM Lane LOS	A	-	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 0.6	0	-	-

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	10	29	1	51	5	45	15	1	1	35	10
Future Vol, veh/h	25	10	29	1	51	5	45	15	1	1	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	11	32	1	55	5	49	16	1	1	38	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	191	161	44	182	166	17	49	0	0	17	0	0
Stage 1	46	46	-	115	115	-	-	-	-	-	-	-
Stage 2	145	115	-	67	51	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	769	731	1026	779	727	1062	1558	-	-	1600	-	-
Stage 1	968	857	-	890	800	-	-	-	-	-	-	-
Stage 2	858	800	-	943	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	701	708	1026	728	704	1062	1558	-	-	1600	-	-
Mov Cap-2 Maneuver	701	708	-	728	704	-	-	-	-	-	-	-
Stage 1	938	856	-	862	775	-	-	-	-	-	-	-
Stage 2	768	775	-	902	851	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	10.4	5.4	0.2
HCM LOS	A	B		




Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1558	-	-	820	726	1600	-
HCM Lane V/C Ratio	0.031	-	-	0.085	0.085	0.001	-
HCM Control Delay (s)	7.4	-	-	9.8	10.4	7.3	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	0	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	14	28	0
Future Vol, veh/h	0	4	1	14	28	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	4	1	15	30	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	47	30	30
Stage 1	30	-	-
Stage 2	17	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	963	1044	1583
Stage 1	993	-	-
Stage 2	1006	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	962	1044	1583
Mov Cap-2 Maneuver	962	-	-
Stage 1	992	-	-
Stage 2	1006	-	-



















Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1583	-	1044	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	10	4	6	51	18
Future Vol, veh/h	2	10	4	6	51	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	2	2	2	2	2	2
Mvmt Flow	2	11	4	7	55	20
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	13	0	23	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	15	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1606	-	993	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1008	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1606	-	991	1074
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	1006	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.9		8.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1011	-	-	1606	-	
HCM Lane V/C Ratio	0.074	-	-	0.003	-	
HCM Control Delay (s)	8.8	-	-	7.2	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Timings
01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy
2025 Bkgrd + Project (with Improvements) - PM Peak Hour

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	42	675	5	5	308	20	5	157	5
Future Volume (vph)	42	675	5	5	308	20	5	157	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2		1	6	7	4	3	8
Permitted Phases	2		2	6		4		8	
Detector Phase	5	2	2	1	6	7	4	3	8
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	10.0	28.0	28.0	10.0	28.0	10.0	28.0	10.0	28.0
Total Split (s)	10.0	42.0	42.0	10.0	42.0	10.0	28.0	10.0	28.0
Total Split (%)	11.1%	46.7%	46.7%	11.1%	46.7%	11.1%	31.1%	11.1%	31.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None

Intersection Summary

Cycle Length: 90











Actuated Cycle Length: 90










Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 4: Valdai Street & Stephen D Hogan Pkwy

	Ø1		Ø2 (R)			Ø3		Ø4
10 s		42 s			10 s		28 s	
	Ø5		Ø6 (R)			Ø7		Ø8
10 s		42 s			10 s		28 s	

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	750	6	6	428	36	91	185	94
v/c Ratio	0.08	0.63	0.01	0.02	0.40	0.16	0.36	0.81	0.32
Control Delay	5.9	14.5	0.0	5.8	12.9	28.9	15.0	62.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	14.5	0.0	5.8	12.9	28.9	15.0	62.0	13.1
Queue Length 50th (ft)	8	227	0	1	139	16	5	90	3
Queue Length 95th (ft)	20	484	0	5	222	24	12	#183	42
Internal Link Dist (ft)		350			557		352		320
Turn Bay Length (ft)	275		225	225		100		100	
Base Capacity (vph)	588	1195	1072	363	1067	226	455	227	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.63	0.01	0.02	0.40	0.16	0.20	0.81	0.21

Intersection Summary























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

HCM 6th Signalized Intersection Summary

01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy

2025 Bkgd + Project (with Improvements) - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	675	5	5	308	77	20	5	45	157	5	75
Future Volume (veh/h)	42	675	5	5	308	77	20	5	45	157	5	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	47	750	0	6	342	86	36	9	82	185	6	88
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.55	0.55	0.55	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	543	1088		309	795	200	242	18	160	254	14	200
Arrive On Green	0.04	0.58	0.00	0.01	0.55	0.55	0.03	0.11	0.11	0.06	0.13	0.13
Sat Flow, veh/h	1781	1870	1585	1781	1442	363	1781	159	1450	1781	102	1498
Grp Volume(v), veh/h	47	750	0	6	0	428	36	0	91	185	0	94
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1805	1781	0	1609	1781	0	1601
Q Serve(g_s), s	1.0	25.2	0.0	0.1	0.0	12.6	1.6	0.0	4.8	5.0	0.0	4.9
Cycle Q Clear(g_c), s	1.0	25.2	0.0	0.1	0.0	12.6	1.6	0.0	4.8	5.0	0.0	4.9
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.90	1.00		0.94
Lane Grp Cap(c), veh/h	543	1088		309	0	994	242	0	178	254	0	213
V/C Ratio(X)	0.09	0.69		0.02	0.00	0.43	0.15	0.00	0.51	0.73	0.00	0.44
Avail Cap(c_a), veh/h	574	1088		394	0	994	282	0	393	254	0	391
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	1.00	0.00	0.83	0.00	0.83	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.7	13.2	0.0	11.6	0.0	11.9	33.7	0.0	37.7	37.3	0.0	35.9
Incr Delay (d2), s/veh	0.1	3.6	0.0	0.0	0.0	1.1	0.3	0.0	2.3	10.1	0.0	1.4
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	0.3	9.7	0.0	0.0	0.0	4.6	0.7	0.0	2.0	2.3	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.8	16.7	0.0	11.6	0.0	13.0	34.0	0.0	40.0	47.4	0.0	37.3
LnGrp LOS	A	B		B	A	B	C	A	D	D	A	D
Approach Vol, veh/h	797				434				127			
Approach Delay, s/veh	16.3				13.0				38.3			
Approach LOS	B				B				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.7	58.3	10.0	16.0	8.5	55.6	8.0	18.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	5.0	36.0	5.0	22.0	5.0	36.0	5.0	22.0				
Max Q Clear Time (g_c+I1), s	2.1	27.2	7.0	6.8	3.0	14.6	3.6	6.9				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.4	0.0	2.4	0.0	0.4				

Intersection Summary























HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Timings
01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy
2040 Bkgrd + Project - AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	170	868	100	130	1780	120	10	50	220	10	320
Future Volume (vph)	170	868	100	130	1780	120	10	50	220	10	320
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+ov	pm+pt	NA	Free
Protected Phases	5	2		1	6	7	4	1	3	8	
Permitted Phases	2		2	6		4		4	8		Free
Detector Phase	5	2	2	1	6	7	4	1	3	8	
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	
Minimum Split (s)	10.0	30.0	30.0	10.0	30.0	10.0	30.0	10.0	10.0	30.0	
Total Split (s)	18.0	59.0	59.0	14.0	55.0	17.0	30.0	14.0	17.0	30.0	
Total Split (%)	15.0%	49.2%	49.2%	11.7%	45.8%	14.2%	25.0%	11.7%	14.2%	25.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	5.0	5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None	

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120












Offset: 118 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 4: Valdai Street & Stephen D Hogan Pkwy

			
Ø1	Ø2 (R)	Ø3	Ø4
14 s	59 s	17 s	30 s
			
Ø5	Ø6 (R)	Ø7	Ø8
18 s	55 s	17 s	30 s

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	943	109	141	2158	218	18	91	239	11	348
v/c Ratio	0.76	0.29	0.10	0.31	0.70	0.87	0.12	0.33	1.13	0.07	0.22
Control Delay	46.1	10.8	2.2	5.5	15.3	79.9	52.9	11.1	148.6	52.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	10.8	2.2	5.5	15.6	79.9	52.9	11.1	148.6	52.0	0.3
Queue Length 50th (ft)	80	86	0	10	247	~209	13	0	~243	8	0
Queue Length 95th (ft)	164	174	23	30	681	129	23	4	249	27	0
Internal Link Dist (ft)		350			557		352			320	
Turn Bay Length (ft)	275		225	225		100			100		100
Base Capacity (vph)	280	3278	1062	470	3073	250	372	288	211	372	1583
Starvation Cap Reductn	0	0	0	0	318	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	0.66	0.29	0.10	0.30	0.78	0.87	0.05	0.32	1.13	0.03	0.22

Intersection Summary





























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

HCM 6th Signalized Intersection Summary

01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy

2040 Bkgrd + Project - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (veh/h)	170	868	100	130	1780	205	120	10	50	220	10	320
Future Volume (veh/h)	170	868	100	130	1780	205	120	10	50	220	10	320
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	943	0	141	1935	223	218	18	91	239	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.55	0.55	0.55	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	2981		439	2660	304	347	156	210	334	156	
Arrive On Green	0.06	0.58	0.00	0.05	0.57	0.57	0.10	0.08	0.08	0.10	0.08	0.00
Sat Flow, veh/h	1781	5106	1585	1781	4648	531	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	185	943	0	141	1413	745	218	18	91	239	11	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1775	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.1	11.3	0.0	3.9	36.4	37.1	12.0	1.1	6.3	12.0	0.7	0.0
Cycle Q Clear(g_c), s	5.1	11.3	0.0	3.9	36.4	37.1	12.0	1.1	6.3	12.0	0.7	0.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	217	2981		439	1949	1016	347	156	210	334	156	
V/C Ratio(X)	0.85	0.32		0.32	0.73	0.73	0.63	0.12	0.43	0.72	0.07	
Avail Cap(c_a), veh/h	301	2981		485	1949	1016	347	374	395	334	374	
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	1.00	0.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.5	12.7	0.0	9.9	18.8	18.9	45.7	50.9	47.9	46.6	50.7	0.0
Incr Delay (d2), s/veh	15.4	0.3	0.0	0.3	2.0	3.9	3.6	0.3	1.4	7.2	0.2	0.0
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	3.8	4.1	0.0	1.4	13.4	14.9	6.4	0.5	2.6	7.5	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	13.0	0.0	10.2	20.7	22.8	49.3	51.2	49.3	53.7	50.9	0.0
LnGrp LOS	D	B		B	C	C	D	D	D	D	D	
Approach Vol, veh/h		1128			2299			327			250	
Approach Delay, s/veh		17.4			20.8			49.4			53.6	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	76.1	17.0	16.0	12.3	74.7	17.0	16.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	9.0	53.0	12.0	24.0	13.0	49.0	12.0	24.0				
Max Q Clear Time (g_c+I1), s	5.9	13.3	14.0	8.3	7.1	39.1	14.0	2.7				
Green Ext Time (p_c), s	0.1	7.1	0.0	0.3	0.2	8.1	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

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

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	55	14	0	0	19	291	15	0	428	2
Future Vol, veh/h	5	0	55	14	0	0	19	291	15	0	428	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	60	15	0	0	21	316	16	0	465	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	832	840	466	862	833	324	467	0	0	332	0	0
Stage 1	466	466	-	366	366	-	-	-	-	-	-	-
Stage 2	366	374	-	496	467	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	288	302	597	275	304	717	1094	-	-	1227	-	-
Stage 1	577	562	-	653	623	-	-	-	-	-	-	-
Stage 2	653	618	-	556	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	284	296	597	244	298	717	1094	-	-	1227	-	-
Mov Cap-2 Maneuver	284	296	-	244	298	-	-	-	-	-	-	-
Stage 1	566	562	-	641	611	-	-	-	-	-	-	-
Stage 2	640	606	-	500	562	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.5	20.7	0.5	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	547 244	1227	-	-
HCM Lane V/C Ratio	0.019	-	-	0.119 0.062	-	-	-
HCM Control Delay (s)	8.4	-	-	12.5 20.7	0	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4 0.2	0	-	-

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	0	6	18	0	2	2	206	133	11	405	1
Future Vol, veh/h	2	0	6	18	0	2	2	206	133	11	405	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	7	20	0	2	2	224	145	12	440	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	767	838	441	769	766	297	441	0	0	369	0	0
Stage 1	465	465	-	301	301	-	-	-	-	-	-	-
Stage 2	302	373	-	468	465	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	319	302	616	318	333	742	1119	-	-	1190	-	-
Stage 1	578	563	-	708	665	-	-	-	-	-	-	-
Stage 2	707	618	-	575	563	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	315	298	616	312	329	742	1119	-	-	1190	-	-
Mov Cap-2 Maneuver	315	298	-	312	329	-	-	-	-	-	-	-
Stage 1	577	557	-	707	664	-	-	-	-	-	-	-
Stage 2	704	617	-	563	557	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	16.6	0	0.2
HCM LOS	B	C		




Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1119	-	-	497 331	1190	-	-
HCM Lane V/C Ratio	0.002	-	-	0.017 0.066	0.01	-	-
HCM Control Delay (s)	8.2	-	-	12.4 16.6	8.1	-	-
HCM Lane LOS	A	-	-	B C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.2	0	-	-

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	45	57	66	1	7	10	90	119	1	10	346	40
Future Vol, veh/h	45	57	66	1	7	10	90	119	1	10	346	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	62	72	1	8	11	98	129	1	11	376	43

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	755	746	398	813	767	130	419	0	0	130	0	0
Stage 1	420	420	-	326	326	-	-	-	-	-	-	-
Stage 2	335	326	-	487	441	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	325	342	652	297	332	920	1140	-	-	1455	-	-
Stage 1	611	589	-	687	648	-	-	-	-	-	-	-
Stage 2	679	648	-	562	577	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	293	310	652	208	301	920	1140	-	-	1455	-	-
Mov Cap-2 Maneuver	293	310	-	208	301	-	-	-	-	-	-	-
Stage 1	558	584	-	628	592	-	-	-	-	-	-	-
Stage 2	605	592	-	444	572	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.7	13.1	3.6	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1140	-	-	383	462	1455	-
HCM Lane V/C Ratio	0.086	-	-	0.477	0.042	0.007	-
HCM Control Delay (s)	8.5	-	-	22.7	13.1	7.5	-
HCM Lane LOS	A	-	-	C	B	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.5	0.1	0	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	5	30	13	0
Future Vol, veh/h	0	1	5	30	13	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	1	5	33	14	0




Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	57	14	14	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	950	1066	1604	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	947	1066	1604	-	-	-
Mov Cap-2 Maneuver	947	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1604	-	1066	-	-
HCM Lane V/C Ratio	0.003	-	0.001	-	-
HCM Control Delay (s)	7.3	0	8.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection

Int Delay, s/veh 2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	57	20	10	7	3
Future Vol, veh/h	10	57	20	10	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	2	2	2	2	2	2
Mvmt Flow	11	62	22	11	8	3

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	73
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1527
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1527
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-



























Approach	EB	WB	NB
HCM Control Delay, s	0	4.9	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	927	-	-	1527	-
HCM Lane V/C Ratio	0.012	-	-	0.014	-
HCM Control Delay (s)	8.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Timings
01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy

2040 Bkgrd + Project - PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						
Traffic Volume (vph)	300	1760	120	50	1025	150	30	120	250	20	300
Future Volume (vph)	300	1760	120	50	1025	150	30	120	250	20	300
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+ov	pm+pt	NA	Free
Protected Phases	5	2		1	6	7	4	1	3	8	
Permitted Phases	2		2	6		4		4	8		Free
Detector Phase	5	2	2	1	6	7	4	1	3	8	
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	
Minimum Split (s)	10.0	30.0	30.0	10.0	30.0	10.0	30.0	10.0	10.0	30.0	
Total Split (s)	25.0	58.0	58.0	10.0	43.0	19.0	30.0	10.0	22.0	33.0	
Total Split (%)	20.8%	48.3%	48.3%	8.3%	35.8%	15.8%	25.0%	8.3%	18.3%	27.5%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	5.0	6.0	5.0	5.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None	

Intersection Summary

Cycle Length: 120
























Actuated Cycle Length: 120












Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 4: Valdai Street & Stephen D Hogan Pkwy

											
10 s	58 s					22 s			30 s		
											
25 s	43 s					19 s			33 s		

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	326	1913	130	54	1407	273	55	218	272	22	326
v/c Ratio	0.80	0.67	0.14	0.32	0.66	0.77	0.34	0.60	0.86	0.12	0.21
Control Delay	42.6	21.5	3.8	29.9	13.8	56.3	57.3	26.6	70.0	49.9	0.3
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	42.6	21.5	3.8	29.9	13.8	56.3	57.3	26.6	70.0	49.9	0.3
Queue Length 50th (ft)	180	388	4	13	224	182	41	68	~236	16	0
Queue Length 95th (ft)	276	480	37	m35	391	146	49	48	264	41	0
Internal Link Dist (ft)		350			557		352			320	
Turn Bay Length (ft)	275		225	225		100			100		100
Base Capacity (vph)	429	2838	935	169	2128	354	372	364	318	419	1583
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	0.76	0.67	0.14	0.32	0.66	0.77	0.15	0.60	0.86	0.05	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.





























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

HCM 6th Signalized Intersection Summary

01/30/2023

4: Valdai Street & Stephen D Hogan Pkwy

2040 Bkgrd + Project - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (veh/h)	300	1760	120	50	1025	270	150	30	120	250	20	300
Future Volume (veh/h)	300	1760	120	50	1025	270	150	30	120	250	20	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	326	1913	0	54	1114	293	273	55	218	272	22	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.55	0.55	0.55	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	354	2498		165	1546	407	478	282	294	451	329	
Arrive On Green	0.14	0.49	0.00	0.01	0.13	0.13	0.12	0.15	0.15	0.14	0.18	0.00
Sat Flow, veh/h	1781	5106	1585	1781	4025	1059	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	326	1913	0	54	942	465	273	55	218	272	22	0
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1680	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	14.4	36.7	0.0	2.2	31.9	31.9	14.0	3.1	15.6	15.3	1.2	0.0
Cycle Q Clear(g_c), s	14.4	36.7	0.0	2.2	31.9	31.9	14.0	3.1	15.6	15.3	1.2	0.0
Prop In Lane	1.00		1.00	1.00		0.63	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	2498		165	1308	645	478	282	294	451	329	
V/C Ratio(X)	0.92	0.77		0.33	0.72	0.72	0.57	0.19	0.74	0.60	0.07	
Avail Cap(c_a), veh/h	402	2498		177	1308	645	478	374	372	451	421	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.5	25.0	0.0	24.6	46.2	46.2	38.0	44.6	46.1	35.5	41.2	0.0
Incr Delay (d2), s/veh	24.4	2.3	0.0	1.0	2.9	5.7	1.6	0.3	5.8	2.3	0.1	0.0
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	8.1	14.3	0.0	0.9	15.0	15.3	7.1	1.5	6.6	6.9	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	27.3	0.0	25.6	49.1	51.9	39.7	44.9	51.9	37.7	41.3	0.0
LnGrp LOS	D	C		C	D	D	D	D	D	D	D	
Approach Vol, veh/h		2239			1461			546			294	
Approach Delay, s/veh		31.2			49.1			45.1			38.0	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	64.7	22.0	24.1	21.8	52.1	19.0	27.1				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	5.0	52.0	17.0	24.0	20.0	37.0	14.0	27.0				
Max Q Clear Time (g_c+I1), s	4.2	38.7	17.3	17.6	16.4	33.9	16.0	3.2				
Green Ext Time (p_c), s	0.0	9.7	0.0	0.5	0.3	2.2	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	3	0	34	32	0	0	55	494	15	0	446	5
Future Vol, veh/h	3	0	34	32	0	0	55	494	15	0	446	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	37	35	0	0	60	520	16	0	469	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1120	1128	472	1138	1122	528	474	0	0	536	0	0
Stage 1	472	472	-	648	648	-	-	-	-	-	-	-
Stage 2	648	656	-	490	474	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	204	592	179	206	550	1088	-	-	1032	-	-
Stage 1	573	559	-	459	466	-	-	-	-	-	-	-
Stage 2	459	462	-	560	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	176	193	592	161	195	550	1088	-	-	1032	-	-
Mov Cap-2 Maneuver	176	193	-	161	195	-	-	-	-	-	-	-
Stage 1	541	559	-	434	440	-	-	-	-	-	-	-
Stage 2	434	437	-	525	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	33.4	0.9	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	497 161	1032	-	-
HCM Lane V/C Ratio	0.055	-	-	0.081 0.216	-	-	-
HCM Control Delay (s)	8.5	-	-	12.9 33.4	0	-	-
HCM Lane LOS	A	-	-	B D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3 0.8	0	-	-

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	0	5	120	0	10	6	468	24	2	365	2
Future Vol, veh/h	1	0	5	120	0	10	6	468	24	2	365	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	5	130	0	11	7	509	26	2	397	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	944	951	398	941	939	522	399	0	0	535	0	0
Stage 1	402	402	-	536	536	-	-	-	-	-	-	-
Stage 2	542	549	-	405	403	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	*253	*252	652	*255	*258	*685	1160	-	-	*1025	-	-
Stage 1	*625	*600	-	*646	*566	-	-	-	-	-	-	-
Stage 2	*646	*566	-	*622	*600	-	-	-	-	-	-	-
Platoon blocked, %	1	1		1	1	1		-	-	1	-	-
Mov Cap-1 Maneuver	*247	*250	652	*251	*256	*685	1160	-	-	*1025	-	-
Mov Cap-2 Maneuver	*247	*250	-	*251	*256	-	-	-	-	-	-	-
Stage 1	*621	*599	-	*642	*562	-	-	-	-	-	-	-
Stage 2	*632	*562	-	*616	*599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	33.3	0.1	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	512	264	*1025	-
HCM Lane V/C Ratio	0.006	-	-	0.013	0.535	0.002	-
HCM Control Delay (s)	8.1	-	-	12.1	33.3	8.5	-
HCM Lane LOS	A	-	-	B	D	A	-
HCM 95th %tile Q(veh)	0	-	-	0	2.9	0	-




Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	7.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	60	10	58	1	51	10	117	358	1	10	308	20
Future Vol, veh/h	60	10	58	1	51	10	117	358	1	10	308	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	11	63	1	55	11	127	389	1	11	335	22

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1045	1012	346	1049	1023	390	357	0	0	390	0	0
Stage 1	368	368	-	644	644	-	-	-	-	-	-	-
Stage 2	677	644	-	405	379	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	207	239	697	205	236	658	1202	-	-	1169	-	-
Stage 1	652	621	-	461	468	-	-	-	-	-	-	-
Stage 2	443	468	-	622	615	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	148	212	697	164	209	658	1202	-	-	1169	-	-
Mov Cap-2 Maneuver	148	212	-	164	209	-	-	-	-	-	-	-
Stage 1	583	615	-	412	418	-	-	-	-	-	-	-
Stage 2	338	418	-	551	609	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	39.1		26.5		2.1		0.2	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	239	234	1169	-
HCM Lane V/C Ratio	0.106	-	-	0.582	0.288	0.009	-
HCM Control Delay (s)	8.3	-	-	39.1	26.5	8.1	-
HCM Lane LOS	A	-	-	E	D	A	-
HCM 95th %tile Q(veh)	0.4	-	-	3.3	1.1	0	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	14	28	0
Future Vol, veh/h	0	4	1	14	28	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	4	1	15	30	0




Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	47	30	30
Stage 1	30	-	-
Stage 2	17	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	963	1044	1583
Stage 1	993	-	-
Stage 2	1006	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	962	1044	1583
Mov Cap-2 Maneuver	962	-	-
Stage 1	992	-	-
Stage 2	1006	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1583	-	1044	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection

Int Delay, s/veh 6.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	10	4	10	51	18
Future Vol, veh/h	10	10	4	10	51	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	2	2	2	2	2	2
Mvmt Flow	11	11	4	11	55	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	22
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1593
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1593
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1593	-
HCM Lane V/C Ratio	0.075	-	-	0.003	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	3	0	34	32	0	0	55	494	15	0	446	5
Future Vol, veh/h	3	0	34	32	0	0	55	494	15	0	446	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	37	35	0	0	60	520	16	0	469	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1120	1128	472	1138	1122	528	474	0	0	536	0	0
Stage 1	472	472	-	648	648	-	-	-	-	-	-	-
Stage 2	648	656	-	490	474	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	204	592	179	206	550	1088	-	-	1032	-	-
Stage 1	573	559	-	459	466	-	-	-	-	-	-	-
Stage 2	459	462	-	560	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	176	193	592	161	195	550	1088	-	-	1032	-	-
Mov Cap-2 Maneuver	176	193	-	161	195	-	-	-	-	-	-	-
Stage 1	541	559	-	434	440	-	-	-	-	-	-	-
Stage 2	434	437	-	525	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	33.4	0.9	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	497	161	1032	-
HCM Lane V/C Ratio	0.055	-	-	0.081	0.216	-	-
HCM Control Delay (s)	8.5	-	-	12.9	33.4	0	-
HCM Lane LOS	A	-	-	B	D	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.8	0	-

Intersection: **Stephen D. Hogan Pkwy at Valdai Street**

Warrant 2: 4 Hour Analysis - 2025 Project Volumes

	Major	Minor*		Warrant 2 (Figure 4C-1)
	Stephen D. Hogan Pkwy	Valdai Street		
Time of Day	Number of Lanes			
	2	1		
0:00				no
1:00				no
2:00				no
3:00				no
4:00				no
5:00				no
6:00				no
7:00	777	85		no
8:00	1,340	147		Yes
9:00	858	94		no
10:00				no
11:00				no
12:00				no
13:00				no
14:00				no
15:00				no
16:00	856	182		no
17:00	1,112	237		Yes
18:00	912	194		Yes
19:00	834	178		no
20:00				no
21:00				no
22:00				no
23:00				no

*The minor volume for each hour represents the higher of either minor approach.

Sheet No 1 of 2

Major Street Stephen D. Hogan Parkway
 Minor Street Valdai Street

Project Aurora One PA-5
 Scenario 2025 Project
 Peak Hour AM

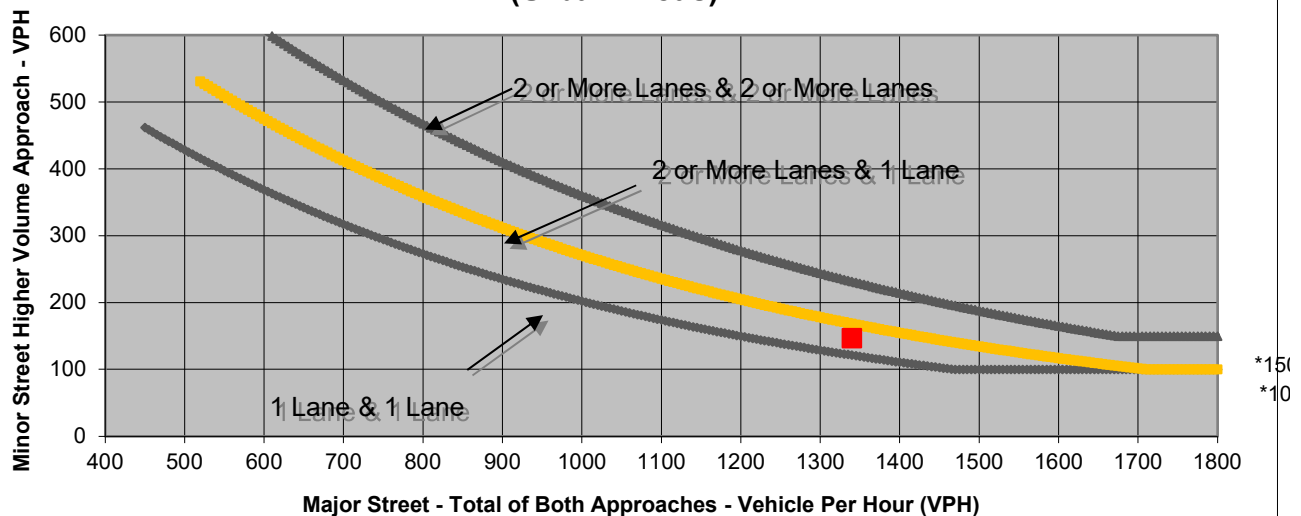
Turn Movement Volumes

	NB	SB	EB	WB
Left	10	87	58	65
Through	5	5	343	698
Right	15	55	20	156
Total	30	147	421	919

Major Street Direction

	North/South
x	East/West

**Figure 4C-3
 Warrant 3, Peak Hour
 (Urban Areas)**



* Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: *Manual on Uniform Traffic Control Devices*, FHWA, 2009

	Major Street	Minor Street	<u>Warrant Met</u>
	Stephen D. Hogan Parkway	Valdai Street	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	1,340	147	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Sheet No 2 of 2

Major Street Stephen D. Hogan Parkway
 Minor Street Valdai Street

Project Aurora One PA-5
 Scenario 2025 Project
 Peak Hour PM

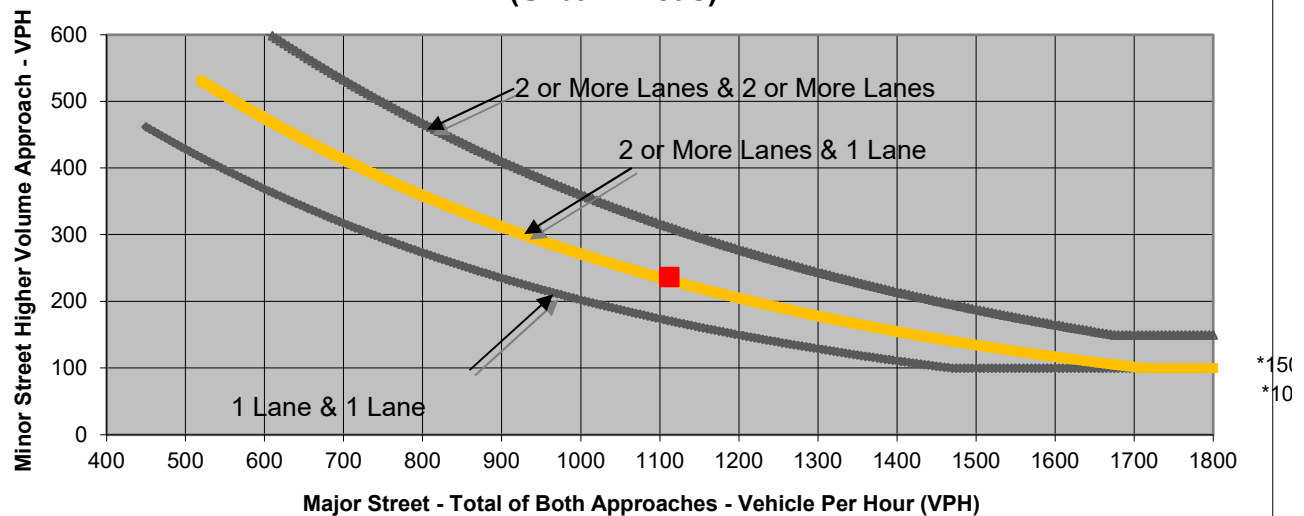
Turn Movement Volumes

	NB	SB	EB	WB
Left	20	157	42	5
Through	5	5	675	308
Right	45	75	5	77
Total	70	237	722	390

Major Street Direction

	North/South
x	East/West

**Figure 4C-3
 Warrant 3, Peak Hour
 (Urban Areas)**



* Note: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Source: *Manual on Uniform Traffic Control Devices*, FHWA, 2009

	Major Street	Minor Street	<u>Warrant Met</u>
	Stephen D. Hogan Parkway	Valdai Street	
Number of Approach Lanes	2	1	<u>YES</u>
Traffic Volume (VPH) *	1,112	237	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			