2083 Old Lakeshore Road, City of Burlington Transportation Impact and Parking Study

Paradigm Transportation Solutions Limited

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220617

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Project Summary

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2083 Old Lakeshore Road
City of Burlington
Transportation Impact and Parking Study



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Executive Summary

Content

The Old Lakeshore Development Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct a Transportation Impact Study for the proposed redevelopment of 2083 Old Lakeshore Road in the City of Burlington. Official Plan Amendment and Zoning By-law Amendment applications are required to permit the proposed development.

This study includes an analysis of existing traffic conditions, a description of the proposed development, heavy vehicle turning analysis, traffic forecasts and operational analysis for the five-year horizon from the year of the study. A parking study is also included to compare the site's anticipated parking demand to the site's proposed supply.

The study includes a multi-model level of service review of the study area and identifies the recommended improvements to accommodate the site generated traffic, if any.

Development Concept

The subject site is located at the municipal address of 2083 Old Lakeshore Road in the City of Burlington.

The development concept includes a 27-storey mixed-use building with approximately 196 units and 418 m^2 (4,502 sq.ft) of retail space. Build-out is anticipated to occur by Year 2029.

The site's vehicle parking supply is identified as 210 parking spaces (1.07 spaces/unit). All vehicle parking is located below grade in a multi-level parking structure.

100 long-term (0.51 spaces/unit) and 12 short-term (0.06 spaces/unit) bicycle parking spaces are proposed.

Vehicular access to the site is proposed via two driveway connections to Old Lakeshore Road located approximately 65 and 85 metres south/east of Lakeshore Road and Pearl Street intersection.

Conclusion

Based on the investigations carried out, the following is concluded:

- **Existing Traffic Operations:** Under base year (2024) traffic conditions the study area intersections generally operate at acceptable levels of service and within capacity during the AM and PM peak hours. The following 95th percentile southbound left-turn queue length at the intersections of Lakeshore Road at Elizabeth and Pearl Street is anticipated to exceed the available storage during the PM peak hour.
- **Site Generated Traffic:** The subject site is estimated to generate approximately 79 AM peak hour trips and 118 PM new peak hour trips.
- **Heavy Vehicle Circulation:** No conflicts with the proposed on-site geometry are noted.
- **Area Development Growth:** The following background developments were included in the background traffic forecast in addition to a 1% per annum growth rate:
  - 374 Martha Street
  - 2069-2079 Lakeshore Road and 383-385 Pearl Street;
  - 2107 Old Lakeshore Road and 2119 Lakeshore Road;
  - 2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road;
  - 2072 Lakeshore Road;
  - 2020 Lakeshore Drive; and
  - 407 Martha Road.
- **Background Traffic Operations:** Under background traffic conditions, the critical movements identified in the base year traffic analysis are forecast to remain critical. An additional critical movement is noted with the addition of background traffic. The following 95th percentile southbound left-turn queue length at the intersection of Lakeshore Road and Pearl Street is anticipated to exceed the available storage during the AM peak hour.

  The existing site driveways are forecast to operate with delays in the LOS A range with a queue of about one vehicle.
- **Total Traffic Operations:** Under total traffic conditions, operations at the study area intersections are similar to the base

year and background conditions. The addition of site generated traffic is not anticipated to generate any new critical movements.

The driveway approaches to Old Lakeshore Road are forecast to operate within capacity with a v/c ratio of less than 0.05 and delays in the LOS A range. The 95th percentile queue length is forecast to be one vehicle or less.

- **MMLOS:** The proposed development is not expected to impact the bike MMLOS.

  The MMLOS for all intersections within the study area currently achieves the transit MMLOS targets set out by the City of Burlington staff.

  The MMLOS for all intersections within the study area currently achieves the truck and car MMLOS targets set out by the City of Burlington staff.

- **Remedial Measures:** Based upon the warrant assessment, traffic control signals are not warranted at the unsignalized intersections of Lakeshore Road at Martha Street and Old Lakeshore Road under the forecast total traffic conditions.

  The Driveway 1 and Driveway 2 approaches to Old Lakeshore Road does not meet warrant thresholds for the consideration of traffic signal control and should operate under stop control on the Driveway approaches.

  The warrant analysis indicates that eastbound left-turn lanes are not warranted on Old Lakeshore Road at the Site Driveway 1 and Site Driveway 2. No changes to the existing lane configuration are recommended on Old Lakeshore Road at Driveway 1 and Driveway 2.

- **Parking:** Based on empirical survey data that has been collected by both Paradigm and the City staff at multi-family residential buildings in Downtown Burlington as well as a review of industry parking data and precedent the proposed parking supply is supportable.

  Overall, a parking supply rate of 1.07 spaces per residential dwelling unit, which is inclusive of parking to be shared between the mixed-use non-residential uses and visitor parking is appropriate and supportable for the proposed development. A minimum of 6 parking spaces (0.03 spaces/unit) should be dedicated to visitor parking while the remaining 204 parking spaces should be dedicated to resident parking.

- **TDM Measures:** With 100 long-term and 12 short-term spaces proposed, the site's bicycle parking supply meets or exceeds the City's Zoning By-Law requirement.

The applicant will consider developing marketing/informational materials as part of their initial scope of work. Information on transportation options and/or links to the appropriate website should be conveyed to all prospective residents as a component of a resident welcome packet.

Available information should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

As the development promotes the use of other modes of transportation through limited on-site parking that will meet the projected demand, the development plays a significant role in setting an example for residents and visitors to consider non-automotive travel.

- This is an important factor as residents are notified at the onset of the project that parking is proposed to be provided as an additional cost in lieu of the price to rent a unit. If residents are significantly considering changing their travel behaviour, the cost of renting a parking space could be a contributing factor to this change. The development will consider the use of unbundled parking.

Recommendations

Based on the findings of this study, it is recommended that:

- Driveway 2 should be limited to an outbound driveway only.
- The Applicant implement TDM measures as discussed within this report to curb it dependency on vehicular traffic and create a balanced needs approach that encourages alternative modes of transportation rather that focusing solely on vehicle operations.
- A minimum of six spaces be allocated to visitors and the visitors parking supply be shared between the residential and retail visitors.
- It is suggested that the City of Burlington consider enhanced pedestrian and cycling facilities within their complete streets design for Lakeshore Road detailed in **Section 4.3**.

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1 Introduction

1.1 Overview

The Old Lakeshore Development Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct a Transportation Impact Study for the proposed redevelopment of 2083 Old Lakeshore Road in the City of Burlington.

Official Plan Amendment and Zoning By-law Amendment applications are required to permit the proposed development.

Figure 1.1 illustrates the site location.



NTS
https://burlington.maps.arcgis.com/apps/MapSeries/index.html?appid=1d1783b1e626434f95076cba33a5e540

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Site Location

2083 Old Lakeshore Road
220617

Figure 1.1

1.2 Purpose and Scope

The purpose of this study is to determine the net impacts of the development traffic on the surrounding road network, document the adequacy of the proposed parking supply and provide options for reducing personal vehicle use through TDM policies. This study will identify any improvements, if needed, to support the development of the subject site.

The scope of this study is to:

- Document current traffic and site conditions in the vicinity of the development;
- Estimate the background traffic growth in the area;
- Estimate the additional traffic forecast to be generated by the redevelopment of the subject site;
- Assign the forecast traffic to the surrounding road network based on the existing traffic patterns in the study area;
- Assess future total traffic within the study area for a 2029 horizon year (five years beyond the date of the study);
- Assess the study areas Multi-Model Level of Service (MMLOS);
- Assess the site's circulation of delivery and waste collection;
- Forecast the site's parking generation; and
- Review and identify potential Transportation Demand Management (TDM) measures that can be implemented for the proposed development.

Appendix A contains the pre-study consultation material and responses from the City of Burlington. The study generally follows the Halton Region TIS Guidelines[1].

1.3 Study Area

Based on pre-consultation with the City of Burlington, the following intersections have been identified as requiring investigation with respect to the impacts of the additional traffic due to the development of the subject site:

- Lakeshore Road and Old Lakeshore Road (unsignalized);
- Lakeshore Road and Martha Street (unsignalized)

[1] Region of Halton. Transportation Impact Study Guidelines. January 2015.

- Lakeshore Road and Pearl Street/Old Lakeshore Road (signalized)
- Lakeshore Road and Elizabeth Street (signalized); and
- The site driveways to Old Lakeshore Road.

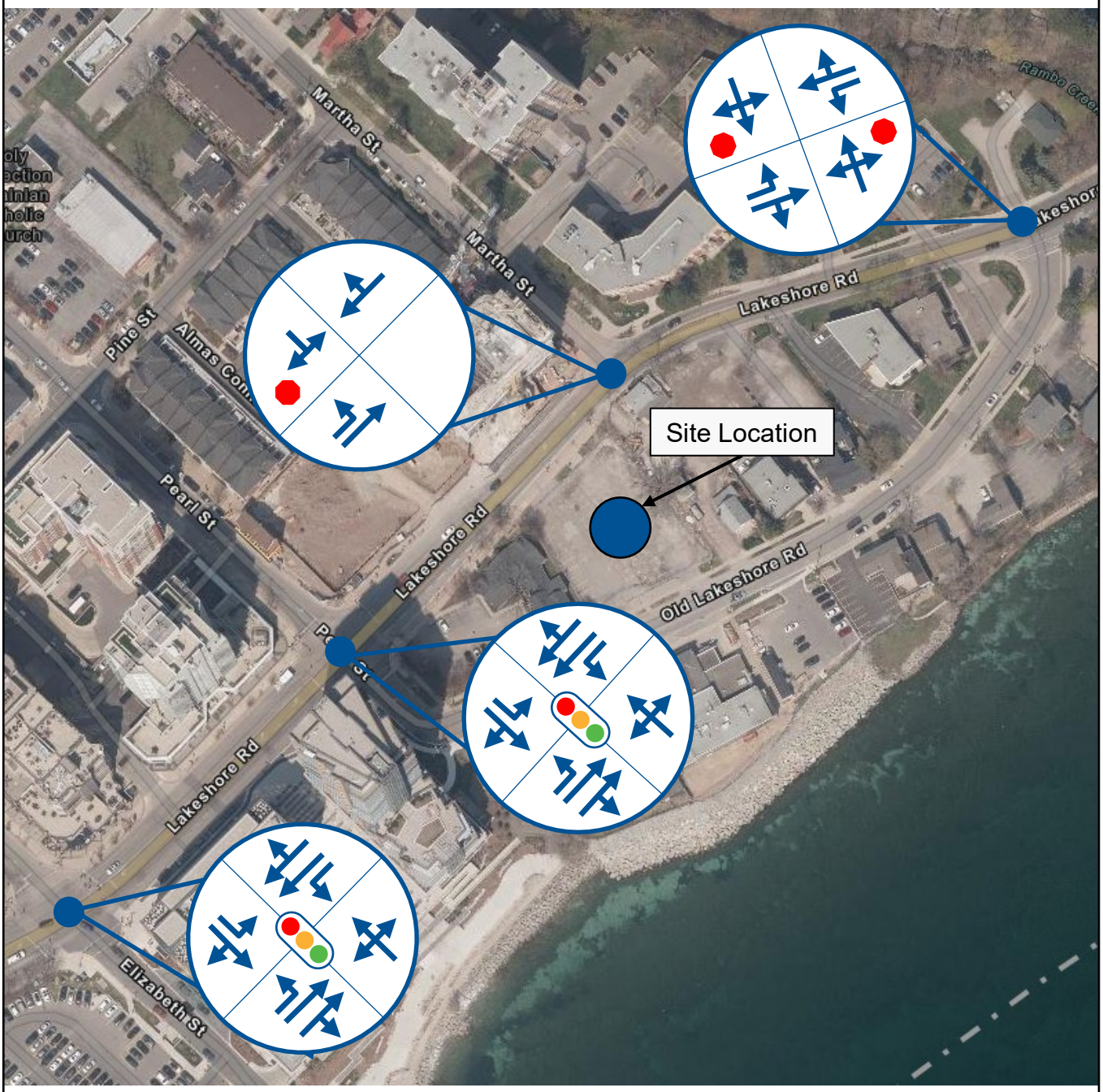
2 Existing Conditions

2.1 Roadways Characteristics

The main roadways in the vicinity of the subject site that have been assessed include Lakeshore Road, James Street, Pine Street, Martha Street, Pearl Street, Elizabeth Street, John Street and Brant Street. The characteristics of these roadways are as follows:

- **Old Lakeshore Road** is an east-west two-lane local street that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section with on-street parking, and sidewalks on both sides. The statutory speed limit of 50 km/h is assumed.
- **Lakeshore Road** is an east-west two-lane main street that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section with sidewalks and no stopping restrictions on both sides of the roadway. The posted speed limit is 50 km/h. The intersections with Elizabeth Street and Pearl Street/Old Lakeshore Road are signalized. The intersections with Martha Street and Old Lakeshore Road are unsignalized.
- **Elizabeth Street** is a north-south two-lane neighbourhood connector that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section with on-street parking and sidewalks on both sides. The statutory speed limit of 50 km/h is assumed.
- **Pearl Street** is a north-south two-lane neighbourhood connector that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section with on-street parking and sidewalks on both sides. The statutory speed limit of 50 km/h is assumed.
- **Martha Street** is a north-south two-lane neighbourhood connector that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section with on-street parking and sidewalks on both sides. The statutory speed limit of 50 km/h is assumed.

Figure 2.1 illustrates the existing lane configurations and traffic control at the study area intersections.



NTS
https://burlington.maps.arcgis.com/apps/MapSeries/index.html?appid=1d1783b1e626434f95076cba33a5e540

Existing Lane Configuration and Traffic Control

2083 Old Lakeshore Road
220617

Figure 2.1

2.2 Transit Service

2.2.1 Local Transit

Burlington Transit (BT) is the public transit operator for the City of Burlington and operates six routes within the study area:

- **Route 2, 3 (Guelph-Downtown)** runs between the Burlington GO Station and the Highway 407 Carpool Lot via Downtown Burlington. The route runs with approximately 15-minute headways during weekday peak hours, and 30-minute headways during other service hours.
- **Route 4 (Central)** runs between Aldershot GO Station and the Appleby GO Station through Downtown Burlington. The route runs with approximately 30-minute headways during the weekday peak hour and other service times.
- **Route 10 (New-Maple)** runs between Burlington GO Station and Appleby GO Station via Downtown Burlington. The route generally operates with approximately 15-minute headways.
- **Route 50 (Burlington South)** provides late night service around the southern portion of the City emanating and terminating at the Burlington GO Station. Buses operate with one-hour headways and provide a connection at the John Street Transit Terminal. The service runs between 10:55 PM and 1:16 AM, Monday to Saturday.
- **Route 52 (Burlington Northwest)** provides late night service around the northwest portion of the City emanating and terminating at the Burlington GO Station. Buses operate with one-hour headways and stop in Downtown Burlington. The service runs between 10:55 PM and 1:22 AM, Monday to Saturday.

The closest bus stop is located less than 50 metres (one-minute walk) away at the intersection of Lakeshore Road and Brant Street. In addition, the development is approximately a 250-metre walk (four-minute walk) to the Downtown Burlington bus terminal which provides significant access to additional local routes.

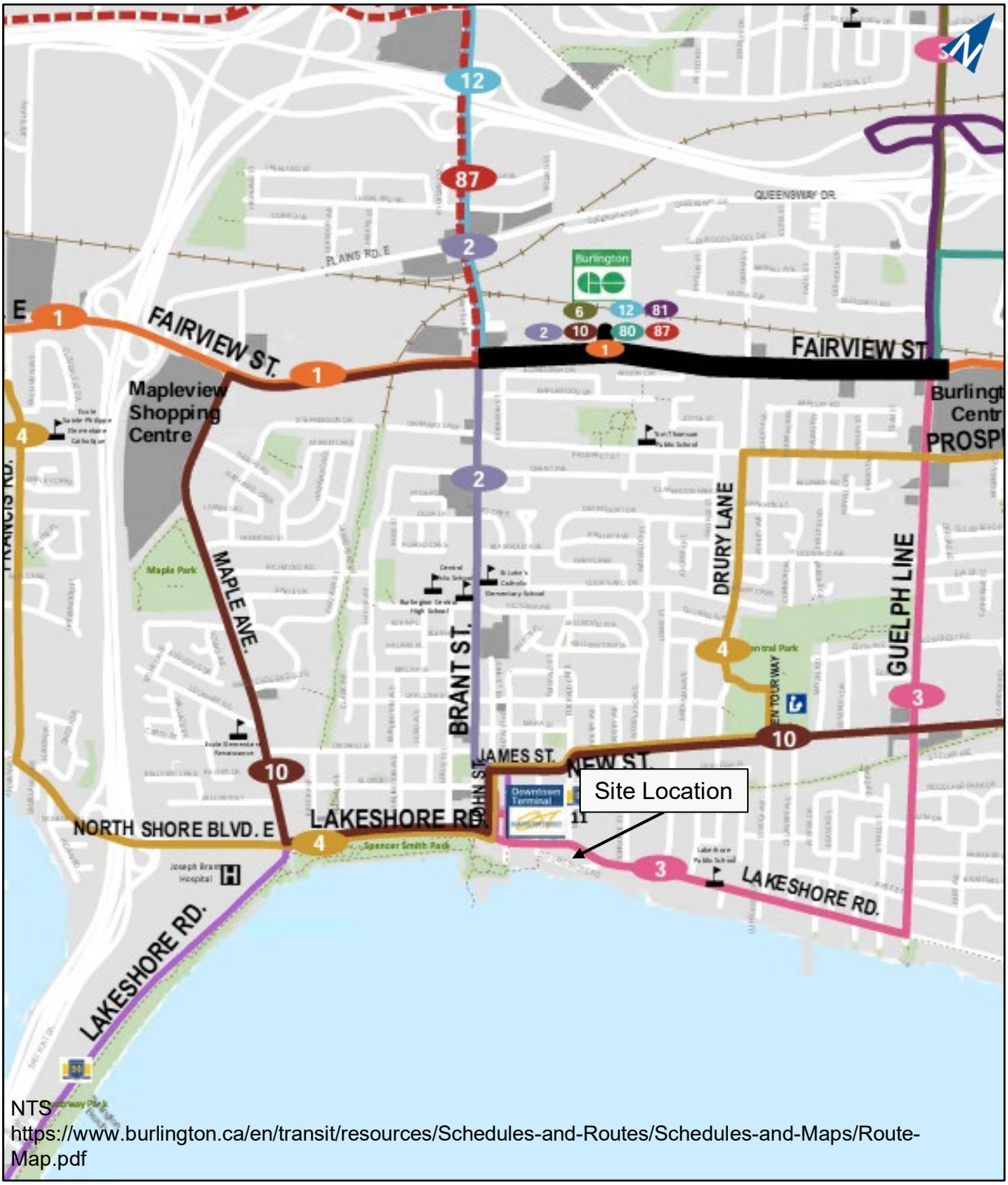
Hamilton Street Railway (HSR) transit services, which is the transit operator in the City of Hamilton, operates Route 11 (Parkdale) out of the Downtown Burlington bus terminal. Service is provided seven days a week form early morning until after mid-night. Headways are approximately 30 minutes.

2.2.2 Interregional Transit

The Burlington GO station is located about 2.5 kilometres north of the subject site which is easily accessible via Burlington Transit.

GO Transit offers both rail and bus service from Burlington GO Station. GO Bus Route 18C and 18F (Lakeshore West) service the Burlington GO Station during the early morning and late-night hours before and after the GO Train service. The Lakeshore WEST GO train service offers frequent train travel from Burlington GO station between Toronto and Hamilton. GO Train service is provided seven days a week with headways generally every 20 to 30 minutes.

Figure 2.2 illustrates the existing local transit network.



NTS
https://www.burlington.ca/en/transit/resources/Schedules-and-Routes/Schedules-and-Maps/Route-Map.pdf

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Existing Transit Network

2083 Old Lakeshore Road
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Figure 2.2

2.3 Active Transportation

2.3.1 Walkability

Pedestrian sidewalks are provided along both sides of roadways through the majority of the study area. There is one gap in the sidewalk network, on Lakeshore Road between Martha Street and Old Lakeshore. This gap is expected to be filled in by adjacent development applications.

At the signalized intersections, crosswalks, pedestrian pushbuttons, pedestrian signal heads and indicators are provided on all approaches.

The site is within walking distance of numerous and significant employment, retail, cultural and recreational opportunities providing for a range of destinations for prospective residents of the proposed building that can be readily accessed without the use of a car. The proximity of the site to such a range of amenities and destinations within walking distance serves to reduce the need for residents of the building to travel on a regular basis using a car.

Walk Score is an online tool that assigns a numerical walkability score between 0 and 100 for addresses in Australia, Canada, United States, and New Zealand. Walk Score ranks communities nationwide based on how many businesses, parks, theatres, schools and other common destinations are within walking distance of any given address. The subject site is noted to have a Walk Score of 93 and is considered a “Very Walkable” location which means most daily errands can be accomplished on foot without the need of a personal vehicle[2].

2.3.2 Cycling

The City’s cycling infrastructure consists of on-street and off-street facilities. On-street routes are comprised of bicycle lanes, signed bicycle routes and paved shoulders. Off-street facilities are in the form of multi-use paths.

The City’s Interactive Cycling Map[3] identifies cycling facilities on Pearl Street. Pearl Street currently operate with shared use shoulders (sharrows). A review of the City’s Cycling Plan[4] has identified Lakeshore Road as proposed a Bicycle Priority Street with short term project priority.

[2] https://www.walkscore.com/score/2083-old-lakeshore-rd-burlington-on-canada
[3] City of Burlington: Cycling Network. Civic Plan Mapping, 2016.
[4] City of Burlington: Cycling Plan. March 2021.

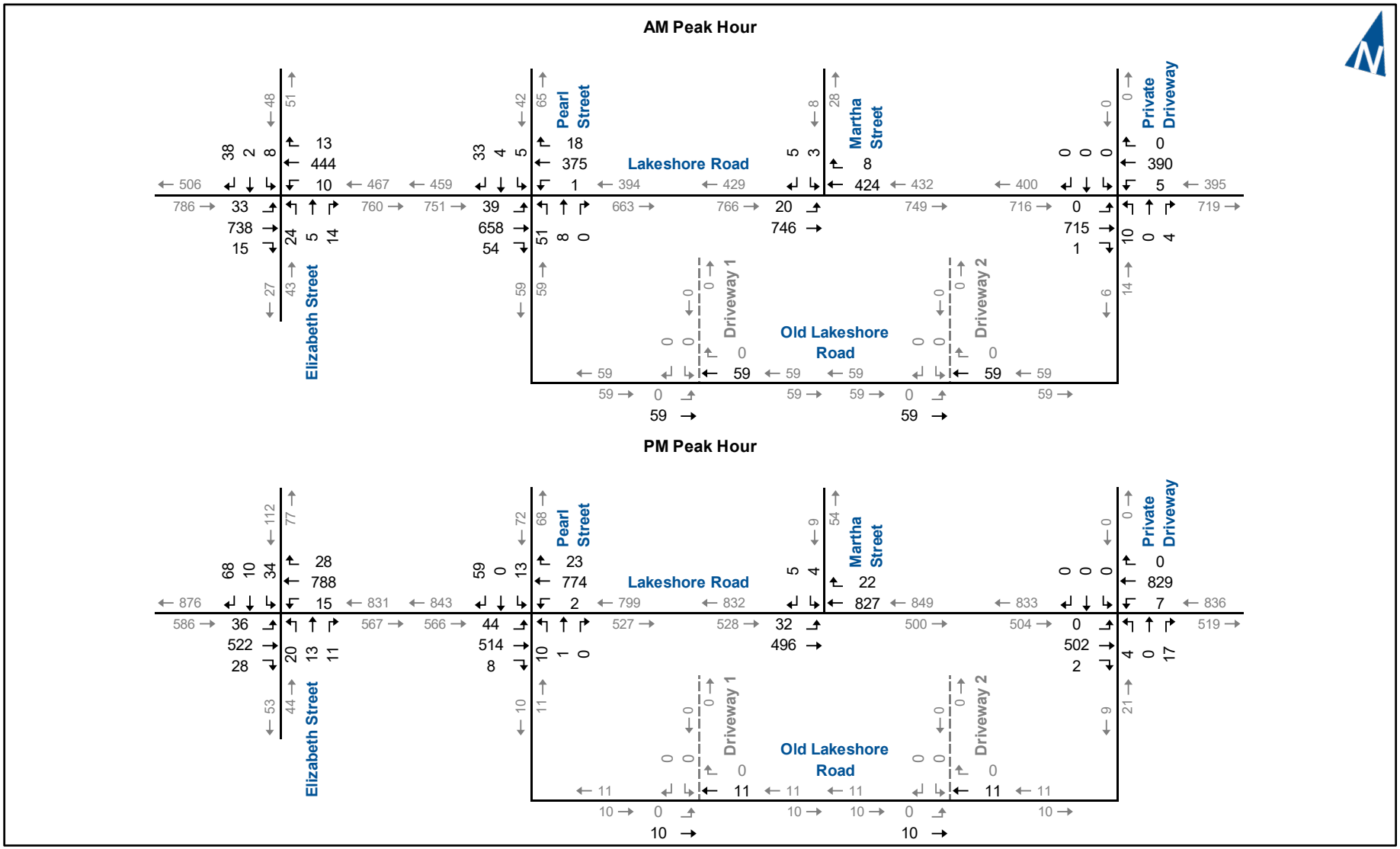
2.4 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles. Existing traffic data at an intersection or on a road section forms the foundation for analysis. The counts are usually taken during peak periods at an intersection to complete level of service analysis. Pyramid Traffic Inc. collected turning movement counts (TMC) on April 18th, 2023. **Appendix B** contains the traffic data utilized in this report.

2.4.1 Base Year Adjustments

Reasonable demand projections can be produced through the use of a growth rate to factor that counts to be representative of base year volumes. Based on the correspondence with City staff, the TMCs have been factored with the use of a compound annual growth rate of 1% to reflect 2024 Base Year conditions.

Figure 2.3 illustrates the base year traffic volumes with adjustments incorporated as described herein.



Base Year Traffic Volumes

2083 Old Lakeshore Road
220617

Figure 2.3

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows. The highest possible rating is LOS A, under which the average total delay is equal or less than 10 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections (50 seconds at unsignalized intersections), the movement is considered to have a LOS F and remedial measures are usually implemented if they are feasible.

The operations of the intersections in the study area were evaluated using Synchro 11, the existing lane configuration, traffic control, base year traffic volumes and signal timings. The intersection analysis consider the following measures of performance:

- The LOS for each turning movement. LOS is based on average control delay per vehicle;
- The volume to capacity ratio (v/c) for each movement and
- 95th percentile queue length (m), estimated using Synchro 11.

Under the Region's TIS Guidelines, the following criteria indicate critical conditions and signify that mitigation measures may need to be considered:

- Signalized intersections:
  - Volume to capacity ratios for through movements or shared through/turning movements are greater than or equal to 0.85,
  - Volume to capacity ratios for exclusive turning movements are greater than or equal to 0.95, and
  - Queue lengths for individual movements that are projected to exceed the available turning lane storage. Queue lengths estimated using Synchro.
- Unsignalized intersections
  - Delays classified as LOS E-F;
  - Queue lengths for individual movements that are projected to exceed the available turning lane storage. Queue lengths estimated using Synchro.

Table 2.1 summarizes the results of the analysis for the base year weekday AM and PM peak hour intersection operations. The following critical movements are noted:

PM Peak Hour

- Elizabeth Street & Lakeshore Road (Signalized)
  - Southbound Left-Turn: The 95th percentile queue is forecast to exceed the current available storage (15 m) by approximately 1 m. The 95th percentile queue length spill-over is anticipated to fit within the existing taper and deceleration area.
- Pearl Street & Lakeshore Road (Signalized)
  - Southbound Left-Turn: The 95th percentile queue is forecast to exceed the current available storage (5 m) by approximately 4 m. The 95th percentile queue length spill-over is anticipated to fit within the existing taper and deceleration area.

Appendix C contains the supporting detailed Synchro 11 output.

TABLE 2.1: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	2	2	>	**2**	2	2	>	**2**	<	40	>	**40**	39	39	>	**39**	**4**
			V/C	0.05	0.27	>		0.02	0.17	>		<	0.25	>		0.08	0.04	>		**0.27**
			Q	3	24	>		2	14	>		<	15	>		5	10	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	37	-	>		23	-	>		<	-	>		10	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	2	2	>	**2**	2	2	>	**2**	<	48	>	**48**	44	45	>	**45**	**6**
			V/C	0.06	0.26	>		0.00	0.15	>		<	0.42	>		0.04	0.22	>		**0.28**
			Q	4	26	>		0	14	>		<	25	>		4	17	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	31	-	>		15	-	>		<	-	>		1	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	A	A		**A**		A	>	**A**					B		>	**B**	**A**
			Delay	9	0		**0**		0	>	**0**					13		>	**13**	**0**
			V/C	0.02	0.49				0.28	>						0.02		>		
			Q	0	0				0	>						0		>		
			Stor.	15	-				-	>						-		>		
			Avail.	15	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	A	A	>	**A**	A	A	>	**A**	<	C	>	**C**	<	A	>	**A**	**A**
			Delay	0	0	>	**0**	10	0	>	**0**	<	16	>	**16**	<	0	>	**0**	**0**
			V/C	0.00	0.46	>		0.01	0.25	>		<	0.04	>		<	0.00	>		
			Q	0	0	>		0	0	>		<	1	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	10	-	>		15	-	>		<	-	>		<	-	>		
PM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	2	2	>	**2**	2	2	>	**2**	<	43	>	**43**	43	42	>	**42**	**6**
			V/C	0.09	0.20	>		0.02	0.29	>		<	0.25	>		0.26	0.11	>		**0.29**
			Q	4	17	>		2	27	>		<	18	>		16	16	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	36	-	>		23	-	>		<	-	>		-1	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	2	2	>	**2**	2	2	>	**2**	<	46	>	**46**	45	47	>	**47**	**5**
			V/C	0.09	0.19	>		0.00	0.29	>		<	0.08	>		0.10	0.38	>		**0.30**
			Q	5	18	>		1	30	>		<	8	>		9	25	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	30	-	>		14	-	>		<	-	>		-4	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	A	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	10	0		**1**		0	>	**0**					16		>	**16**	**0**
			V/C	0.04	0.30				0.52	>						0.03		>		
			Q	1	0				0	>						1		>		
			Stor.	15	-				-	>						-		>		
			Avail.	14	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	A	A	>	**A**	A	A	>	**A**	<	B	>	**B**	<	A	>	**A**	**A**
			Delay	0	0	>	**0**	8	0	>	**0**	<	13	>	**13**	<	0	>	**0**	**0**
			V/C	0.00	0.32	>		0.01	0.52	>		<	0.05	>		<	0.00	>		
			Q	0	0	>		0	0	>		<	1	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	10	-	>		15	-	>		<	-	>		<	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

3 Development Concept

3.1 Site Description

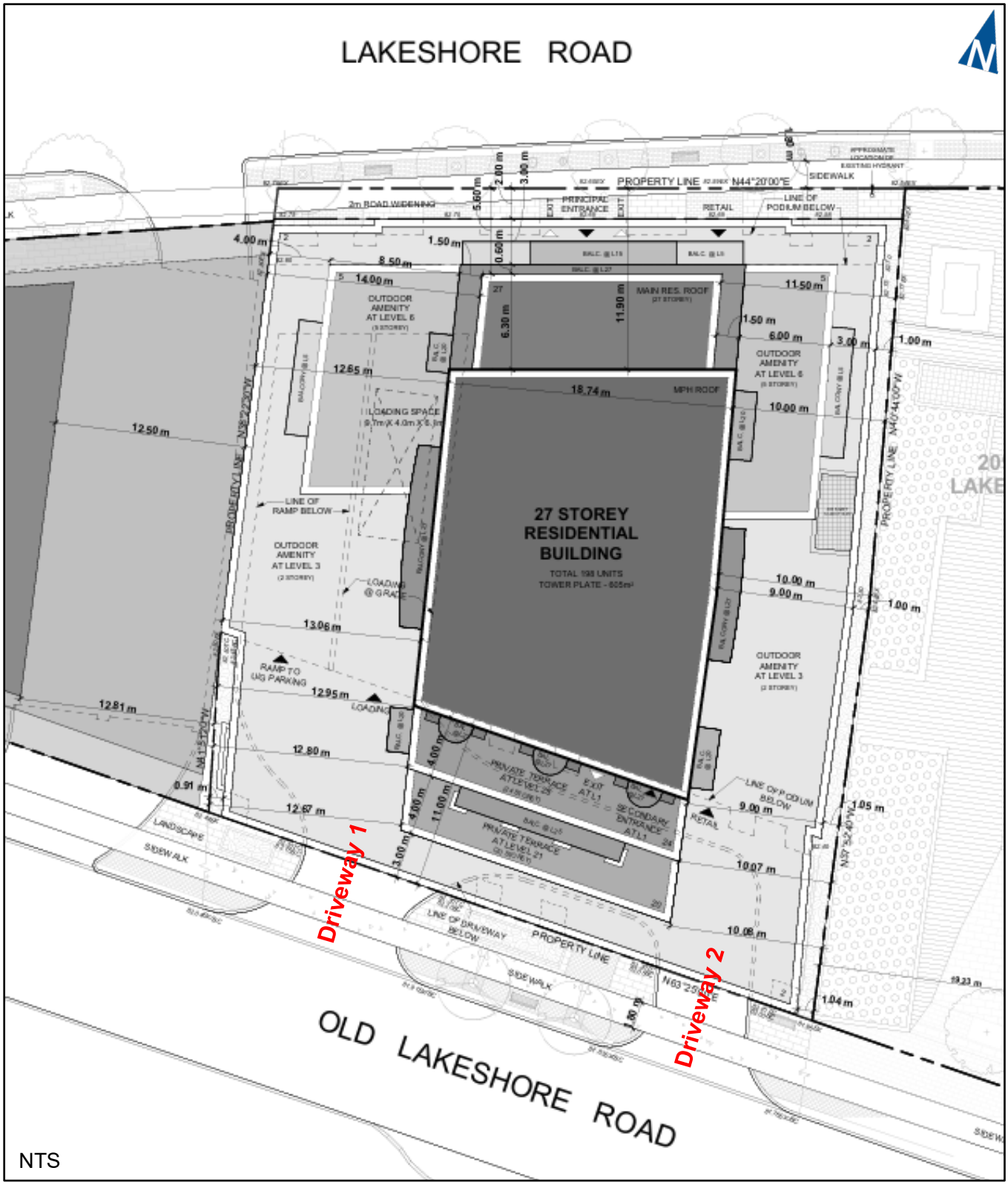
The subject site is located at the municipal address of 2083 Old Lakeshore Road in the City of Burlington. **Figure 3.1** illustrates the conceptual site plan. The site plan illustrates a 2.0 m wide right of way widening across the site's Lakeshore Road frontage.

The development concept includes a 27-storey mixed-use building with approximately 196 units and 418 m^2 (4,502 sq.ft) of retail space. Build-out is anticipated to occur by Year 2029.

The site's vehicle parking supply is identified as 210 parking spaces (1.07 spaces/unit). All vehicle parking is located below grade in a multi-level parking structure.

100 long-term (0.51 spaces/unit) and 12 short-term (0.06 spaces/unit) bicycle parking spaces are proposed.

Vehicular access to the site is proposed via two driveway connections to Old Lakeshore Road located approximately 65 and 85 metres south/east of Lakeshore Road and Pearl Street intersection.



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Site Location

2083 Old Lakeshore Road
220617

Figure 3.1

3.2 Trip Generation

Trip generation information is used to forecast the anticipated level of traffic activity because of the development.

The Institute of Transportation Engineers (ITE) Trip Generation[5] methods predict the site trip generation. The following land use codes were referenced to estimate the site's trip generation:

- Multifamily Housing (High-Rise) land-use code (LUC) 222 - Not Close to Rail.
- Strip Retail Plaza (<40k sq.ft. GFA) (LUC 822)

Table 3.1 summarizes the estimated trip generation. The subject site is estimated to generate approximately 79 AM peak hour trips and 118 PM new peak hour trips. No modal split adjustments have been applied to the trip generation estimate to account for active transportation or transit-oriented trips as these are accounted for within the ITE rates.

To be conservative, the retail trip generation estimates were included in the analysis without any reductions. The City Zoning By-law[6] does not require parking spaces for retail land-uses within the downtown parking exemption area so, the associated trip generation outlined below is considered conservative.

TABLE 3.1: ESTIMATED TRIP GENERATION

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) (LUC 222) – Not Close to Rail[1] - 196 Units	16	46	**62**	46	28	**74**
Strip Retail Plaza (<40k) (LUC 822)[2] – 4,502 sq. ft.	10	7	**17**	22	22	**44**
New Trips	**26**	**53**	**79**	**68**	**50**	**118**

[1]AM Peak Hour - T = 0.22(X) + 18.85, PM Peak Hour - T = 0.26(X) + 23.12

[2]AM Peak Hour - Ln(T) = 0.66 Ln(X) + 1.84, PM Peak Hour - Ln(T) = 0.71 Ln(X) + 2.72

5 Trip Generation Manual 11th Edition Institute of Transportation Engineers, Washington DC, September 2021

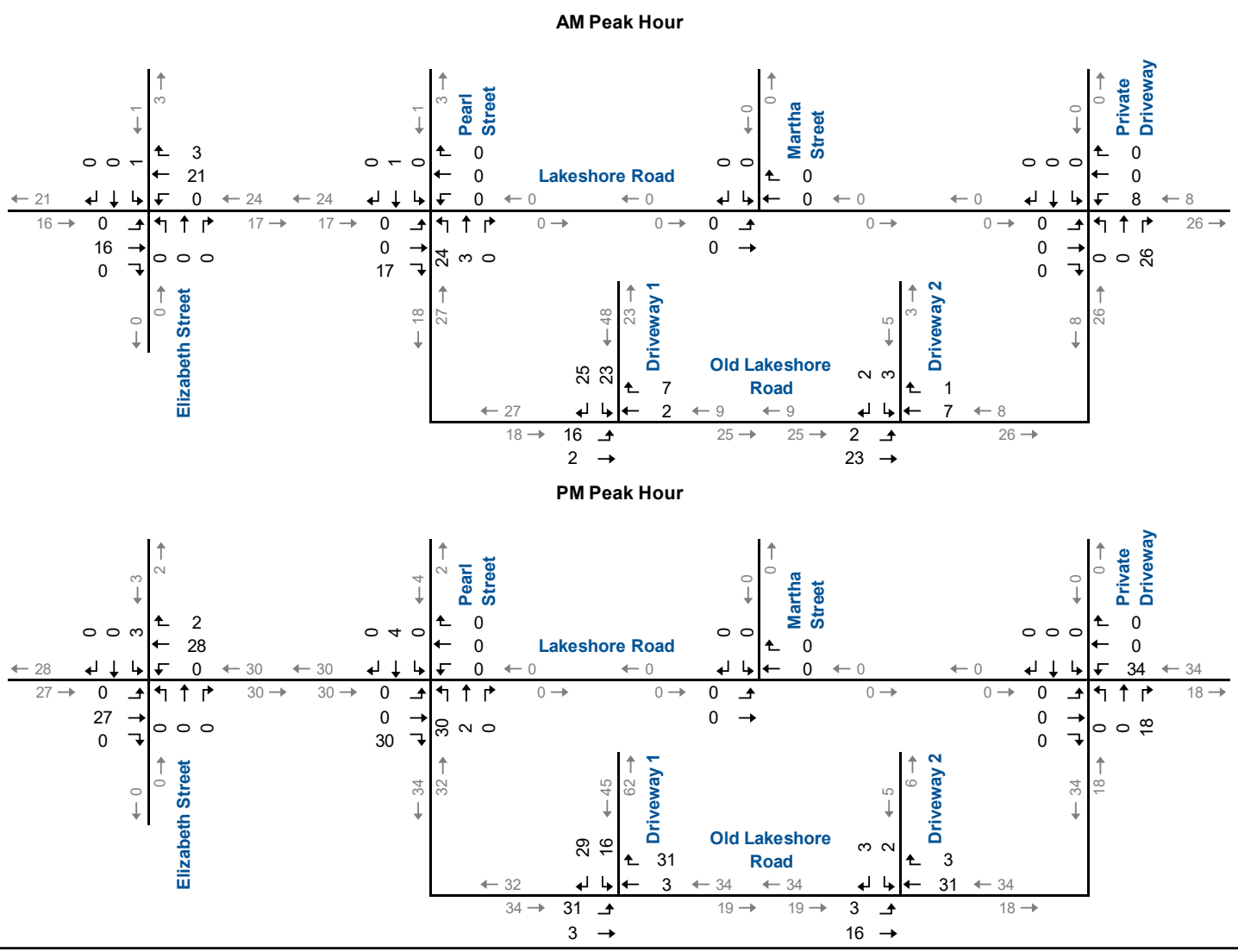
6 City of Burlington. *Zoning By-law 2020*. (Burlington. September, 2024).

Table 3.2 summarizes the estimated trip distribution. The distribution is based off existing travel patterns at the study area intersections. This approach was approved during pre-consultation with Regional and City staff.

Figure 3.2 illustrates the site generated traffic for the AM and PM peak hours, respectively.

TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
East via Lakeshore Road	30%	50%	50%	35%
West via Lakeshore Road	60%	40%	40%	55%
North via Pearl Street	5%	5%	5%	5%
North via Elizabeth Street	5%	5%	5%	5%
Total	**100%**	**100%**	**100%**	**100%**



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Site Generated Traffic

2083 Old Lakeshore Road
220617

Figure 3.2

3.3 Site Access Review

Heavy vehicle and site circulation were assessed using AutoTURN swept path analysis software. Four design vehicles were used in the analysis:

- Transportation Association of Canada (TAC) Medium Single Unit (MSU);
- TAC Heavy Single Unit (HSU);
- TAC Passenger Car (P); and
- Halton Front End Loader.

Appendix D contains the AutoTURN swept path analysis. No conflicts with the proposed on-site geometry are noted. At the Site Plan Stage, a detailed signage and pavement marking plan will be prepared for the site.

4 Future Traffic Conditions

4.1 Forecast Traffic Volumes

A five-year horizon (Year 2029) following the date of year of the study (Year 2024) has been assessed. The likely future traffic volumes near the subject site are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth);
- Traffic generated by nearby approved developments; and
- Traffic generated by the proposed development.

During pre-study consultations, City staff confirmed the application of a generalized background traffic growth rate of 1% per annum. The City identified the following developments to include in the background traffic forecast:

- **374 Martha Street**[7] – consisting of approximately 240 high-rise units and 4,555 sq.ft. of retail space.
- **2069-2079 Lakeshore Road and 383-385 Pearl Street**[8] – consisting of approximately 320 residential units (2 townhouses, and 318 high-rise units) and 5,003 sq.ft. of retail space.
- **2107 Old Lakeshore Road and 2119 Lakeshore Road**[9] – consisting of approximately 150 residential high-rise units and 6,451 sq.ft. of retail space.
- **2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road**[10] – consisting of approximately 310 residential high-rise units and 4,590 sq.ft of retail space.
- **2072 Lakeshore Road** – consisting of approximately 267 residential high-rise units and 4,590 sq.ft of retail space.

7 Paradigm. *140850 374/380 Martha Street, Burlington Traffic Impact Study and Parking Study Opinion Letter*. (Paradigm. June 2016).
8 170177: 2069 Lakeshore Road Transportation Impact Study, Parking Study and TDM Options Report Paradigm, August 2018.
9 Paradigm. *170176 Old Lakeshore Road, Transportation Impact Study, Parking Study and TDM Options Report.* (Paradigm. February 2020).
10 Lea. *19275 2100 Lakeshore Road Burlington, ON Transportation Impact Study.* (Lea. August 2019).

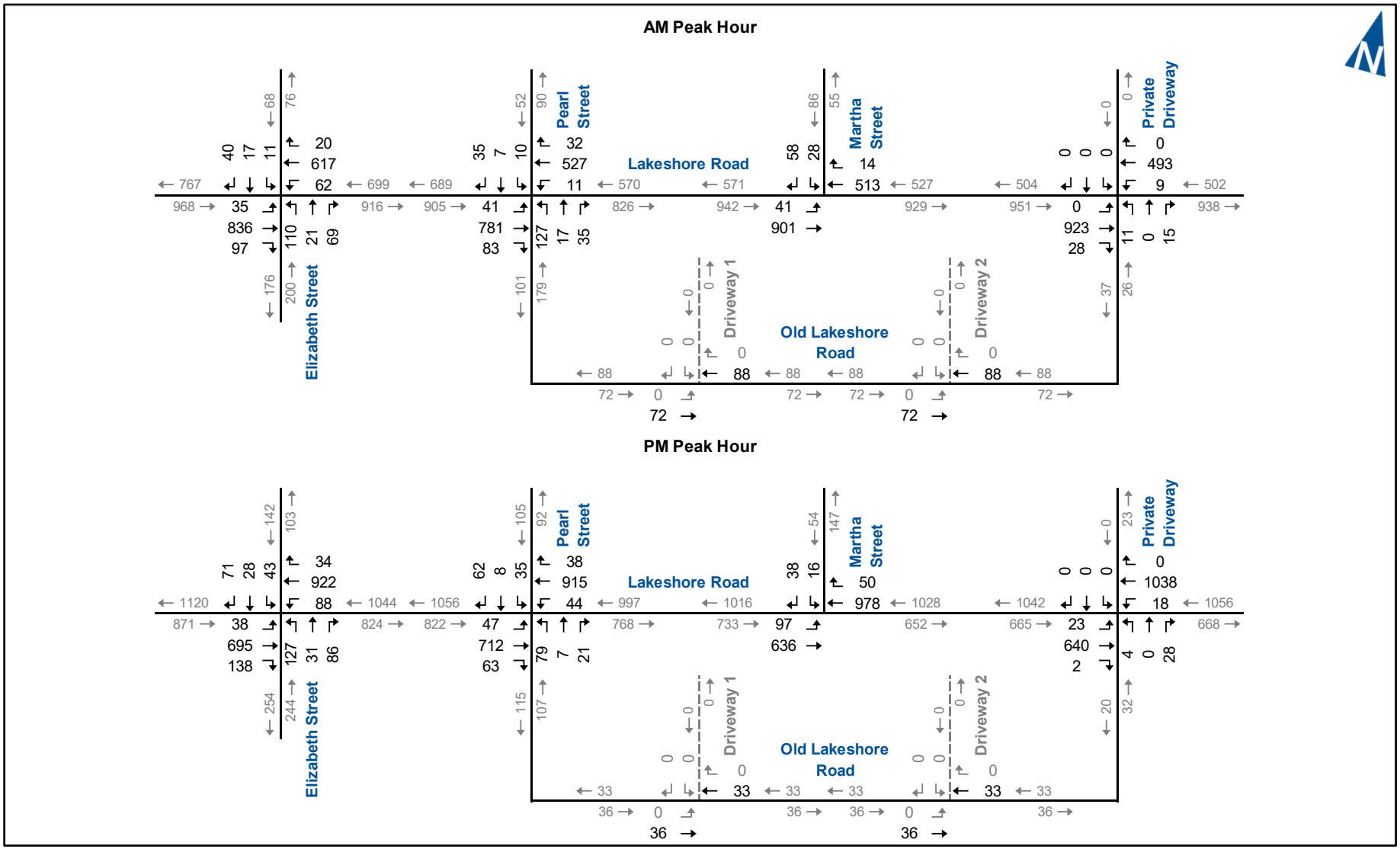
- **2020 Lakeshore Road**[11] – consisting of approximately 557 residential high-rise units, 122 hotel units, 46,802 sq.ft of office space and 47,846 sq.ft of retail space.
- **407 Martha Road** – consisting of approximately 130 high-rise units.

Traffic forecasts for background developments were referenced from the respective traffic studies, where available. For developments without traffic studies, trips generated is estimated using ITE trip generation methodology.

Appendix E contains the forecast traffic volumes for the other area developments.

Figure 4.1 illustrates the forecast background traffic volumes for the AM and PM peak hours, respectively. **Figure 4.2** illustrates the forecast total traffic volumes for the AM and PM peak hours, respectively.

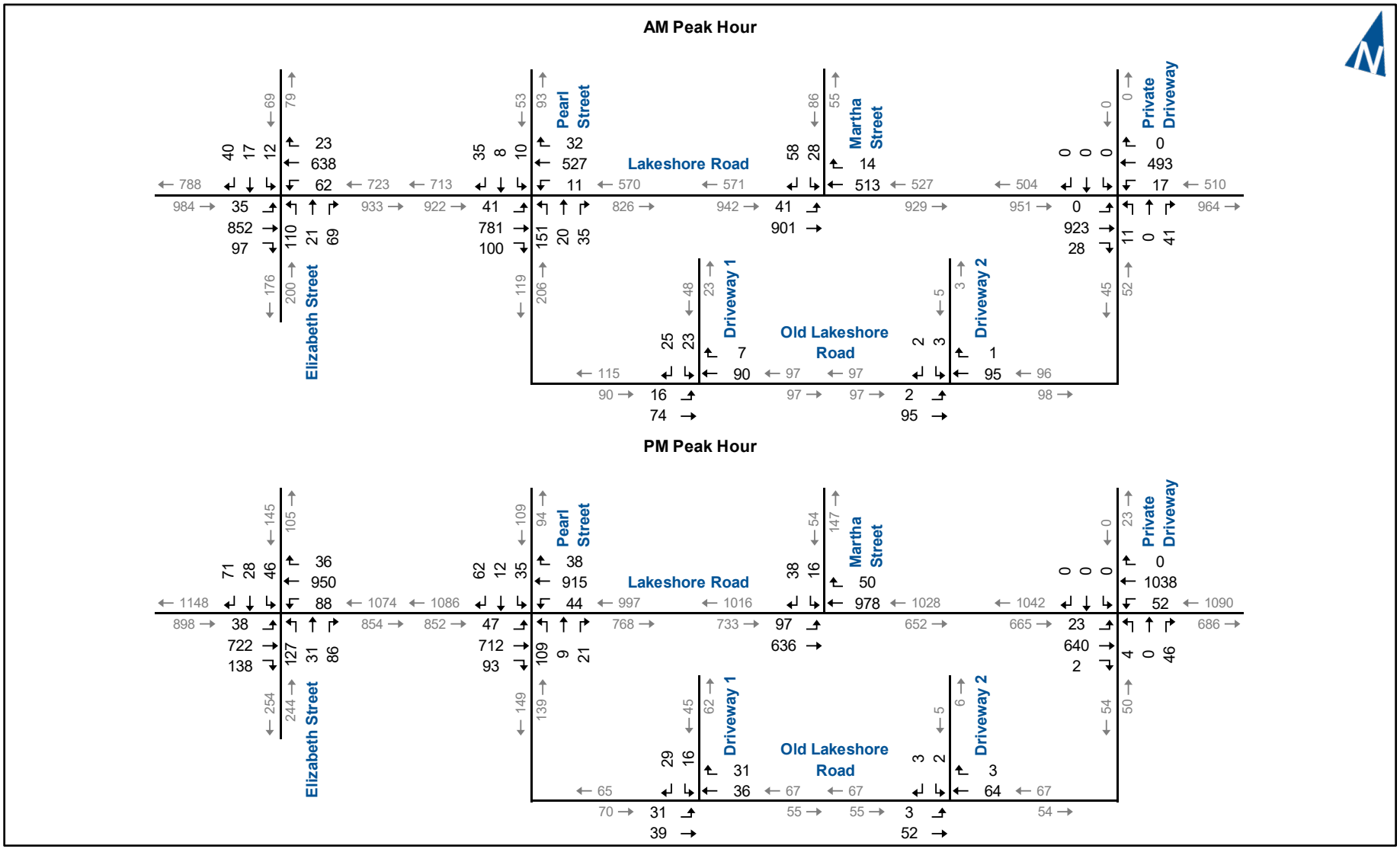
[11] Paradigm. *210065 2020 Old Lakeshore Road, Burlington Transportation, Parking & TDM Study*. (Paradigm. October 2021).



Background Traffic Forecast

2083 Old Lakeshore Road
220617

Figure 4.1



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Total Traffic Forecast

2083 Old Lakeshore Road
220617

Figure 4.2

4.2 Forecast Traffic Operations

4.2.1 Background Traffic Operations

The study area intersection operations analysis for the background traffic scenario followed the same methodology used for the existing traffic conditions with the existing traffic signal timings.

Table 4.1 summarizes the level of service conditions. The critical movements highlighted in the base year traffic operations are forecast to remain critical in the background traffic scenario. The new critical movements are summarized below:

AM Peak Hour

- Pearl Street & Lakeshore Road (Signalized)
  - Southbound Left-Turn: The 95th percentile queue is forecast to exceed the current available storage (5 m) by approximately 2 m. The 95th percentile queue length spill-over is anticipated to fit within the existing taper and deceleration area.

Appendix F contains the supporting detailed Synchro 11 output.



TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	C	C	>	C	B
			Delay	5	7	>	7	7	6	>	6	<	40	>	40	31	31	>	31	11
			V/C	0.08	0.40	>		0.22	0.28	>		<	0.64	>		0.07	0.09	>		0.45
			Q	7	65	>		13	42	>		<	59	>		7	13	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	33	-	>		12	-	>		<	-	>		8	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	B
			Delay	4	6	>	6	4	5	>	5	<	48	>	48	38	38	>	38	11
			V/C	0.08	0.35	>		0.03	0.23	>		<	0.66	>		0.05	0.14	>		0.42
			Q	7	54	>		3	32	>		<	64	>		7	18	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	28	-	>		12	-	>		<	-	>		-2	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	A	A		A		A	>	A					C		>	C	A
			Delay	9	0		0		0	>	0					19		>	19	1
			V/C	0.05	0.59				0.34	>						0.27		>		
			Q	1	0				0	>						8		>		
			Stor.	15	-				-	>						-		>		
			Avail.	14	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	A	A	>	A	B	A	>	A	<	C	>	C	<	A	>	A	A
			Delay	0	0	>	0	11	0	>	0	<	21	>	21	<	0	>	0	0
			V/C	0.00	0.61	>		0.02	0.32	>		<	0.11	>		<	0.00	>		
			Q	0	0	>		0	0	>		<	3	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	10	-	>		15	-	>		<	-	>		<	-	>		
PM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	B
			Delay	7	7	>	7	8	8	>	8	<	53	>	53	36	35	>	35	14
			V/C	0.14	0.36	>		0.24	0.40	>		<	0.77	>		0.21	0.13	>		0.49
			Q	8	55	>		17	68	>		<	84	>		19	20	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	32	-	>		8	-	>		<	-	>		-4	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	A	A	A	>	A	<	D	>	D	D	D	>	D	A
			Delay	4	4	>	4	3	4	>	4	<	45	>	45	42	43	>	42	8
			V/C	0.13	0.30	>		0.10	0.36	>		<	0.51	>		0.19	0.31	>		0.39
			Q	7	38	>		6	50	>		<	39	>		17	28	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	28	-	>		9	-	>		<	-	>		-12	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	B	A		A		A	>	A					C		>	C	A
			Delay	12	0		2		0	>	0					22		>	22	1
			V/C	0.16	0.39				0.63	>						0.22		>		
			Q	4	0				0	>						6		>		
			Stor.	15	-				-	>						-		>		
			Avail.	11	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	B	A	>	A	A	A	>	A	<	B	>	B	<	A	>	A	A
			Delay	11	0	>	0	9	0	>	0	<	15	>	15	<	0	>	0	1
			V/C	0.04	0.40	>		0.02	0.65	>		<	0.09	>		<	0.00	>		
			Q	1	0	>		0	0	>		<	2	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	9	-	>		15	-	>		<	-	>		<	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.2.2 Total Traffic Operations

The study area intersection operations analysis for the background traffic scenario followed the same methodology used for the existing traffic conditions with the existing traffic signal timings.

Table 4.2 summarizes the level of service conditions for the AM and PM peak hours. The critical movements highlighted in the base year and background traffic operations are forecast to remain critical in the total traffic scenario. No additional critical movements are identified in the total traffic scenario.

The driveway approaches to Old Lakeshore Road are forecast to operate within capacity with a v/c ratio of less than 0.05 and delays in the LOS A range. The 95th percentile queue length is forecast to be one vehicle or less.

While it is forecasted that both site driveways to Old Lakeshore Road will function with an acceptable level of service, to reduce the number of outbound vehicles onto Old Lakeshore Road and to facilitate drop-off/pick-up trips it is suggested that Driveway 2 should be limited to an inbound driveway only. It is anticipated that Driveway 1 will continue to function with an acceptable level of service during the AM and PM peak hours.

Appendix G contains the supporting detailed Synchro 11 output.



TABLE 4.2A: TOTAL TRAFFIC OPERATIONS – AM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	C	C	>	**C**	**B**
			Delay	5	7	>	**7**	7	6	>	**6**	<	40	>	**40**	31	31	>	**31**	**11**
			V/C	0.08	0.41	>		0.22	0.29	>		<	0.64	>		0.08	0.09	>		**0.46**
			Q	7	67	>		13	44	>		<	59	>		7	13	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	33	-	>		12	-	>		<	-	>		8	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**B**
			Delay	5	6	>	**6**	5	6	>	**6**	<	50	>	**50**	36	37	>	**37**	**12**
			V/C	0.08	0.37	>		0.03	0.24	>		<	0.72	>		0.05	0.13	>		**0.45**
			Q	7	55	>		3	32	>		<	74	>		7	19	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	28	-	>		12	-	>		<	-	>		-2	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	A	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	9	0		**0**		0	>	**0**					19		>	**19**	**1**
			V/C	0.05	0.59				0.34	>						0.27		>		
			Q	1	0				0	>						8		>		
			Stor.	15	-				-	>						-		>		
			Avail.	14	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	A	A	>	**A**	B	A	>	**A**	<	C	>	**C**	<	A	>	**A**	**A**
			Delay	0	0	>	**0**	11	0	>	**0**	<	23	>	**23**	<	0	>	**0**	**1**
			V/C	0.00	0.61	>		0.03	0.32	>		<	0.22	>		<	0.00	>		
			Q	0	0	>		1	0	>		<	6	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	10	-	>		14	-	>		<	-	>		<	-	>		
	Old Lakeshore Road & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					A		>	**A**	**A**
			Delay	<	1		**1**		0	>	**0**					10		>	**10**	**3**
			V/C	<	0.01				0.06	>						0.06		>		
			Q	<	0				0	>						2		>		
	Old Lakeshore Road & Driveway 2	TWSC	LOS	<	A		**A**		A	>	**A**					A		>	**A**	**A**
			Delay	<	0		**0**		0	>	**0**					9		>	**9**	**0**
			V/C	<	0.00				0.06	>						0.01		>		
			Q	<	0				0	>						0		>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

TABLE 4.2B: TOTAL TRAFFIC OPERATIONS – PM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Elizabeth Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**B**
			Delay	7	7	>	**7**	8	8	>	**8**	<	53	>	**53**	36	35	>	**35**	**14**
			V/C	0.15	0.37	>		0.25	0.41	>		<	0.77	>		0.22	0.13	>		**0.50**
			Q	8	57	>		18	70	>		<	84	>		20	20	>		
			Stor.	40	-	>		25	-	>		<	-	>		15	-	>		
			Avail.	32	-	>		7	-	>		<	-	>		-5	-	>		
	Pearl Street & Lakeshore Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	<	D	>	**D**	D	D	>	**D**	**A**
			Delay	5	5	>	**5**	4	5	>	**5**	<	47	>	**47**	40	41	>	**40**	**10**
			V/C	0.14	0.32	>		0.11	0.38	>		<	0.60	>		0.16	0.27	>		**0.42**
			Q	9	48	>		8	60	>		<	51	>		17	29	>		
			Stor.	35	-	>		15	-	>		<	-	>		5	-	>		
			Avail.	26	-	>		7	-	>		<	-	>		-12	-	>		
	Lakeshore Road & Martha Street	TWSC	LOS	B	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	12	0		**2**		0	>	**0**					22		>	**22**	**1**
			V/C	0.16	0.39				0.63	>						0.22		>		
			Q	4	0				0	>						6		>		
			Stor.	15	-				-	>						-		>		
			Avail.	11	-				-	>						-		>		
	Old Lakeshore Road & Lakeshore Road	TWSC	LOS	B	A	>	**A**	A	A	>	**A**	<	C	>	**C**	<	A	>	**A**	**A**
			Delay	11	0	>	**0**	9	0	>	**0**	<	15	>	**15**	<	0	>	**0**	**1**
			V/C	0.04	0.40	>		0.06	0.65	>		<	0.13	>		<	0.00	>		
			Q	1	0	>		2	0	>		<	4	>		<	0	>		
			Stor.	10	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	9	-	>		13	-	>		<	-	>		<	-	>		
	Old Lakeshore Road & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					A		>	**A**	**A**
			Delay	<	3		**3**		0	>	**0**					9		>	**9**	**4**
			V/C	<	0.02				0.04	>						0.05		>		
			Q	<	0				0	>						1		>		
	Old Lakeshore Road & Driveway 2	TWSC	LOS	<	A		**A**		A	>	**A**					A		>	**A**	**A**
			Delay	<	0		**0**		0	>	**0**					9		>	**9**	**1**
			V/C	<	0.00				0.04	>						0.01		>		
			Q	<	0				0	>						0		>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.3 Multi-Modal Level of Service

Intersection Level of Service (LOS) is a recognized metric for categorizing the delay experienced by drivers at intersections. The term “Level of Service” denotes how well a traffic movement operates under given traffic demands, lane arrangements, and traffic controls. It converts average delay at intersections into a scale from A to F, where A indicates the least delay and F indicates the greatest delay. The metric is extensively used in transportation planning, but it is limited to the experience of drivers.

Multi-modal Level of Service (MMLOS) extends this concept to incorporate the experience of modes beyond car drivers. It converts a variety of factors into a scale from A to F for each mode, A indicates the best experience for users of that mode and F indicates the worst experience. As the output is a set of indicators, it reveals where changes have different (or opposite) effects on each mode.

This study uses MMLOS guidelines created by the Ontario Traffic Council (OTC).[12] These were developed following a review of national and international best practices in MMLOS analysis. **Table 4.3** summarizes the MMLOS adjusted targets as suggested in the OTC MMMLOS guidelines and by City staff. The methodology for adjusting the level of service targets based on policy input aligns with the MMLOS guidelines.

TABLE 4.3: MMLOS ADJUSTED TARGETS

Road	LOS Target				
	Pedestrians	Bikes	Transit	Trucks	Cars
Lakeshore Road	B	C	C	D	D
Martha Street and Pearl Street	A	B	D	D	D

Table 4.4 summarizes the MMLOS analysis for the total year traffic forecast. **Appendix H** contains the detailed MMLOS inputs.

[12] Dillion Consulting. *Multi-Modal Level of Service Guidelines*. (Toronto: Ontario Traffic Council, 2022)

TABLE 4.4: MULTI-MODAL LEVEL OF SERVICE

Intersection	Type	Pedestrians	Bikes	Buses	Trucks	Cars
Elizabeth Street & Lakeshore Road	S	D	E	C	C	B
Pearl St/Old Lakeshore Rd & Lakeshore Rd	S	C	D	D	D	B
Martha Street & Lakeshore Rd	U	E	D	C	B	A
Private Driveway/Old Lakeshore Rd & Lakeshore Rd	U	C	C	C	C	C

S - Signalized U - Unsignalized

4.3.1 Active Transportation Operations

Pedestrian measures and facilities in the study area generally include sidewalks on at least one side of the road. At signalized intersections, marked crosswalks are present and many of the crosswalks throughout the study area are textured crosswalks. At the unsignalized intersection crosswalks are provided on the stop-controlled approach.

Pedestrian MMLOS throughout the study ranges between C and E. Improvements to the Pedestrian MMLOS could include adding enhanced pedestrian measures at the signalized intersections, such as leading pedestrian intervals (LPIs), to provide additional protections for pedestrian traffic.

While the development will provide pedestrian connections from the site to the existing pedestrian infrastructure, the proposed ROW widening will enable the City to develop an enhanced pedestrian realm.

Bike MMLOS in the study ranges between C and E. Pearl Street currently operates with shared use shoulders (sharrows). Enhanced bike facilities can include crossrides, green conflict markings, dedicated intersection features, protected intersection features, bicycle signal heads, leading bike intervals (LBIs) and protected phases.

A review of the City's Cycling Plan[13] has identified Lakeshore Road as a proposed Bicycle Priority Street with short term project priority. These enhancements would help to promote cycling and improve the bike MMLOS. The City is proposing a right of way (ROW) widening along Lakeshore Road in the study area.

The proposed development is not expected to impact the bike MMLOS. The proposed ROW widening will allow the City of Burlington to provide enhanced pedestrian and cycling infrastructure along Lakeshore Road.

4.3.2 Transit Operations

The MMLOS for all intersections within the study area currently achieves the transit MMLOS targets set out by City of Burlington staff.

Transit stops are provided within walking distance of the proposed site location. It is anticipated that new active transportation trips will easily be able to access the existing transit network. A bus stop is located on the north side of the site along Lakeshore Road. Relocation of the bus stop is not anticipated; however, it is expected that BT will continue to

[13] City of Burlington: Cycling Plan. March 2021.

monitor ridership and evaluate the need for stop improvements (for example, shelter or seating).

4.3.3 Truck and Car Operations

The MMLOS for all intersections withing the study area currently achieves the truck and car MMLOS targets set out by City of Burlington staff. The proposed development is not expected to impact the truck and car MMLOS.

5 Proposed Mitigation Measures

5.1 Traffic Control

The unsignalized intersections within the study area were assessed using the Ontario Traffic Manual (OTM Book 12 – Justification 7) signal warrant procedures[14]. Specifically, the total traffic forecasts were assessed. **Appendix I** contains the warrant analysis.

Based upon the warrant assessment, traffic control signals are not warranted at the unsignalized intersections of Lakeshore Road at Martha Street and Old Lakeshore Road under the forecast total traffic conditions.

The site driveway approaches to Old Lakeshore Road does not meet warrant thresholds for the consideration of traffic signal control and should operate under stop control for the Driveway approach.

5.2 Auxiliary Turn Lanes

The MTO *Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads*[15] provides guidance on the assessment and/or need for auxiliary left-turn lanes. The warrant nomograph to determine if a left-turn lane is needed is based on the following criteria:

- Design speed of the road (posted speed + 10 km/h);
- Advancing volume;
- Opposing volume; and
- Percent of advancing vehicles performing a left-turn maneuver.

The movements were analyzed using the nomographs for left-turn lanes on two-lane undivided highways at unsignalized intersections. **Appendix J** contains the MTO left-turn lane nomographs for the site driveway intersections with Old Lakeshore Road.

The warrant analysis indicates that eastbound left-turn lanes are not warranted on Old Lakeshore Road at the site driveways. No changes to the existing lane configuration are recommended on Old Lakeshore Road at the site driveways.

[14] Ministry Transportation Ontario. Ontario Traffic Manual Book 12. Justification 7. (St. Catharines, November 2007).

[15] MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, June 2017 Appendix 9 for Chapter 9 Intersections

6 Parking Review

6.1 Zoning By-Law Requirements

6.1.1 Parking Supply

The subject site is proposing a total of 210 parking spaces (1.07 spaces per unit). These parking spaces are comprised of 196 (1.00 spaces per unit) residential parking spaces and 14 (0.07 spaces per unit) visitor parking spaces.

6.1.2 Vehicle Parking

Zoning By-law 2020 is the current in-force By-law for the City of Burlington. Based on the City Zoning By-law, the subject site is within the “Downtown Parking Exemption Area” which exempts all non-residential properties from providing on-site parking.

The minimum parking rates for the proposed development are as follows:

- Apartment Dwelling Units: 1.25 spaces per unit; and
- Retail: Parking Exempt.

Table 6.1 summarizes Zoning By-Law 2020 minimum parking standard calculations for the development.

TABLE 6.1: EXISTING ZONING REQUIREMENTS

Land Use	Units	Rate	Required Spaces
Residential	196 units	1.25 spaces/unit	245
Retail	418 m²	0 spaces/100 m²	0
Total			**245**
Supply			**210**
Surplus/Deficit			**-35**

As indicated, the development concept is mandated to supply 245 parking spaces (1.25 spaces per unit). The proposed parking supply of 210 spaces (1.07 spaces per unit) results in a deficit of 35 spaces.

6.2 Residential Parking Supply

6.2.1 Institute of Transportation Engineers (ITE)

The ITE Parking Generation 6th Edition is regarded as a reliable source for parking generation. The requirements specified by ITE's Parking Generation for Multi-Family High-Rise dwellings within a Dense Multi-Use Urban area indicates the parking demand for the Site is reflective of a parking rate of 1.03 spaces per unit (resident and visitor supply). Data is only provided for general urban/suburban for two+-bedrooms which suggests a parking rate of 0.68 spaces per unit (resident and visitor supply).

6.2.2 Parking Utilization Surveys

Paradigm has conducted parking surveys at two sites within Burlington Downtown prior to the COVID-19 pandemic. The surveys were conducted at two different residential sites in the City of Burlington over four (4) different days. Surveys were conducted from 16:00 to 22:00 on weekdays (Tuesday-Thursday) between November 2016 by Paradigm Staff. The surveyed sites included:

- Site 1 – 551 Maple Avenue, Strata Condominium. A 19-storey building with 186 units located in the Downtown Intensification Area.
- Site 2 – 360 Pearl Street, 360 on Pearl Condominiums. A 17-storey building with 75 units located in the Downtown Intensification Area.

Parking demands at the two locations were observed at 0.86 to 0.90 spaces per unit (resident and visitor supply). These observed parking rates are consistent with the ITE data and support a reduced parking supply.

In 2021, the City of Burlington undertook further parking surveys in advance of the Major Transit Station Area (MTSA) Area Specific Planning. The City collected parking survey data within the Downtown from April 2021 to May 2021 in order to re-evaluate the appropriateness of parking rates.

City staff surveyed the following five residential buildings that share the characteristics of the Site and is based on a larger sample size than what occurred during the 2016 surveys:

- 442 Maple Avenue – 135 residential units
- 505 Locust Street – 117 residential units

- 360 Pearl Street – 75 residential units
- 2121 Lakeshore Road – 39 residential units
- 1477 Lakeshore Road – 60 residential units

Parking demands at the five locations were observed at 1.07 spaces per unit inclusive of residential and visitor supply. These observed parking rates are slightly higher than the ITE data, however, still supports a reduced parking supply.

Appendix K contains the parking study data.

6.3 Precedent

A recent development at 2093 Lakeshore Road received approval for a parking rate of 1.07 spaces per unit. This precedent is significant for several reasons:

- **Similar Project Type:** the 2093 Lakeshore Road site is a mixed-use development of similar scale and function to the proposed project;
- **Comparable Location:** Both sites are located in downtown Burlington and share similar proximity to public transit, commercial business and places of employment;
- **Traffic and Parking Conditions:** Both sites are expected to experience comparable traffic, and parking demands due to their location and proximity to places of employment.

Given the strong similarities between the proposed development and the adjacent precedent-setting development at 2093 Lakeshore Road, a parking rate of 1.07 spaces per unit is supported.

Transportation staff have noted that based on studies that were conducted by the City, 1.07 spaces per residential unit is a more appropriate rate, which includes visitor parking, having a breakdown of 1.04 occupant spaces per unit and 0.03 visitor spaces per unit.[16]

It is recommended that a minimum of six spaces be allocated to visitors and the visitors parking supply be shared between the residential and retail visitors.

[16] City of Burlington. *Virtual Committee of Adjustment Meeting.* (Burlington. October 23, 2024)

6.4 Summary

Overall, a parking supply rate of 1.07 spaces per residential dwelling unit, which is inclusive of parking to be shared between the mixed-use non-residential uses and visitor parking is appropriate and supportable for the proposed development. A minimum of six parking spaces (0.03 spaces/unit) should be dedicated to visitor parking while the remaining 204 parking spaces should be dedicated to resident parking.

7 Transportation Demand Management (TDM)

7.1 Design

The goal of a Transportation Demand Management (TDM) plan is to reduce the development's overall traffic and parking impacts through the implementation of strategies that are aimed at affecting the demand side of the transportation equation, rather than the supply side. By there very nature, TDM programs attempt to change people's behavior, and to be successful, they must rely on incentives or disincentives to makeshifts in behavior attractive to the commuter.

TDM strategies include financial incentives, time incentives, the provision of new or enhanced commuter services, dissemination of information, and marketing alternative services. TDM strategies include all the incentives and disincentives that increase the likelihood for people to change their existing travel behavior.

Supporting land-use/infrastructure that encourage people to choose travel modes other than driving alone are a number of factors that influence peoples' travel mode choices. These strategies are already accounted for through the developments overall design and include the following.

7.1.1 Housing Density

Designing the plan with increased densities reduces Greenhouse Gas (GHG) emissions associated with traffic in several ways. Density is usually measured in terms of persons, jobs, or dwellings per unit area. Increased densities generally shorten the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities.

7.1.2 Land Use-Density Mix

Having different types of land uses in close proximity can decrease vehicle mode share since trips between land use types are shorter and may be accommodated by non-automotive transportation. The mix of high-density housing and commercial uses provides land use diversity that should reduce the number of automobile trips that residents or employees make.

7.1.3 Pedestrian Facilities

Accessibility to and from a development is essential in helping to ensure that those that can walk, do. Proper pedestrian connections from the surrounding community to the development should be constructed to ensure safety and to enhance the overall pedestrian experience.

Walking is encouraged by the provision of a pedestrian-friendly site layout that features an extensive network of sidewalks and entrances at key points both within the site and connecting to the existing pedestrian network. The majority of the site is provided with direct public access for pedestrians via multiple street level entrances from Lakeshore Road, Elizabeth Street, and the Waterfront Trail. This is intended to provide a comprehensive network of pedestrian connections to allow for an enhanced pedestrian experience for all users of the site.

By taking advantage of the future public sidewalk network to attract and serve pedestrians, combined with multiple pedestrian connections within the site, the development offers walkability as one of the key design features.

7.1.4 Bicycle Facilities

Increasing bicycling to, from and within Burlington is a key strategy to reducing vehicle trips. The number of people bicycling is directly related to the quality of the bicycling network and presence of bicycling facilities. As outlined in **Section 2.3.2**, bicycle facilities are provided along Pearl Street and additional facilities are proposed along Lakeshore Road within the study area.

7.1.5 Transit

The use of transit places less reliance on the use of personal automobiles for trips that can be completed by convenient and desirable transit options. The provision of convenient and desirable transit can be made by providing well-lit transit stops with seating, and weather protective shelters. Additional amenities including bicycle parking, schedule information, real time bus status, and maps can increase the convenience of the transit network.

The subject site is currently served by six (6) BT Routes and one (1) HSR Route that operate primarily on Lakeshore Road connecting between Burlington GO Station, Aldershot GO Station, and the Appleby GO Station. Headways are on the order of 30 minutes during most service hours, with shorter headways provided during peak hour services.

The improvement of these stops, including the installation of bus shelters with seating, would enhance the transit services. These modifications would further increase the attractiveness and viability of the transit network as a convenient option for residents, visitors and employees of the development.

At the development level, direct links connecting residents and visitor to nearby bus stops are planned to be provided as part of the overall design scheme making the development area more navigable towards local bus stops.

7.2 Proposed Strategies

The proposed strategies identified herein should be considered by the development to reduce the number of auto-trips made to/from the development:

7.2.1 Cycling Facilities

A minimum of 98 long-term and 12 short-term bicycle parking spaces are required. With 100 long-term and 12 short-term spaces proposed, the site's bicycle parking supply meets or exceeds the City's Zoning By-Law requirement.

The site's bicycle parking supply appears to be convenient, secure, and readily available. The bicycle parking spaces are provided close to the buildings entrances and avoid conflicts with pedestrians and vehicles.

7.2.2 Transportation Information

The applicant will consider developing marketing/informational materials as part of their initial scope of work. Information on transportation options and/or links to the appropriate website should be conveyed to all prospective residents as a component of a resident welcome packet.

Available information should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

7.2.3 Parking Supply

The role of parking management is also a key element to helping Burlington meet its trip reduction goals. If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. Free and abundant parking encourages people to drive alone rather than car or van pool, be

dropped off or picked up, walk, cycle or take transit. When too much parking is provided, and is provided free of cost to the user, the use of alternative sustainable modes is put at a substantial disadvantage.

As the development promotes the use of other modes of transportation through limited on-site parking that will meet the projected demand, the development plays a significant role in setting an example for residents and visitors to consider non-automotive travel.

7.2.4 Unbundled Parking

Implementing a paid-parking operation is one of the most effective TDM strategies for encouraging alternative travel habits. To further encourage residents of the apartment building to utilize sustainable travel modes, the development is proposing to lease parking spaces separately from the cost to rent a unit. This is more equitable and efficient since occupants are not forced to pay for parking they do not need and allows consumers to adjust their parking supply to reflect their needs.

This is an important factor as residents are notified at the onset of the project that parking is proposed to be provided as an additional cost in lieu of the price to rent a unit. If residents are significantly considering changing their travel behaviour, the cost of renting a parking space could be a contributing factor to this change. The development will consider the use of unbundled parking.

8 Conclusions and Recommendations

8.1 Conclusions

Based on the investigations carried out, the following is concluded:

- **Existing Traffic Operations:** Under base year (2024) traffic conditions the study area intersections generally operate at acceptable levels of service and within capacity during the AM and PM peak hours. The following 95th percentile southbound left-turn queue length at the intersections of Lakeshore Road at Elizabeth and Pearl Street is anticipated to exceed the available storage during the PM peak hour.
- **Site Generated Traffic:** The subject site is estimated to generate approximately 79 AM peak hour trips and 118 PM new peak hour trips.
- **Heavy Vehicle Circulation:** No conflicts with the proposed on-site geometry are noted.
- **Area Development Growth:** The following background developments were included in the background traffic forecast in addition to a 1% per annum growth rate:
  - 374 Martha Street
  - 2069-2079 Lakeshore Road and 383-385 Pearl Street;
  - 2107 Old Lakeshore Road and 2119 Lakeshore Road;
  - 2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road;
  - 2072 Lakeshore Road;
  - 2020 Lakeshore Drive; and
  - 407 Martha Road.
- **Background Traffic Operations:** Under background traffic conditions, the critical movements identified in the base year traffic analysis are forecast to remain critical. An additional critical movement is noted with the addition of background traffic. The following 95th percentile southbound left-turn queue length at the intersection of Lakeshore Road and Pearl Street is anticipated to exceed the available storage during the AM peak hour.

  The existing site driveways are forecast to operate with delays in the LOS A range with a queue of about one vehicle.

- **Total Traffic Operations:** Under total traffic conditions, operations at the study area intersections are similar to the base year and background conditions. The addition of site generated traffic is not anticipated to generate any new critical movements.

  The driveway approaches to Old Lakeshore Road are forecast to operate within capacity with a v/c ratio of less than 0.05 and delays in the LOS A range. The 95th percentile queue length is forecast to be one vehicle or less.

- **MMLOS:** The proposed development is not expected to impact the bike MMLOS.

  The MMLOS for all intersections withing the study area currently achieves the transit MMLOS targets set out by City of Burlington staff.

  The MMLOS for all intersections withing the study area currently achieves the truck and car MMLOS targets set out by City of Burlington staff.

- **Remedial Measures:** Based upon the warrant assessment, traffic control signals are not warranted at the unsignalized intersections of Lakeshore Road at Martha Street and Old Lakeshore Road under the forecast total traffic conditions.

  The Driveway 1 and Driveway 2 approaches to Old Lakeshore Road does not meet warrant thresholds for the consideration of traffic signal control and should operate under stop control on the Driveway approaches.

  The warrant analysis indicates that eastbound left-turn lanes are not warranted on Old Lakeshore Road at the Site Driveway 1 and Site Driveway 2. No changes to the existing lane configuration are recommended on Old Lakeshore Road at Driveway 1 and Driveway 2.

- **Parking:** Based on empirical survey data that has been collected by both Paradigm and the City staff at multi-family residential buildings in Downtown Burlington as well as a review of industry parking data and precedent the proposed parking supply is supportable.

  Overall, a parking supply rate of 1.07 spaces per residential dwelling unit, which is inclusive of parking to be shared between the mixed-use non-residential uses and visitor parking is appropriate and supportable for the proposed development. A minimum of 6 parking spaces (0.03 spaces/unit) should be dedicated to visitor parking while the remaining 204 parking spaces should be dedicated to resident parking.



- **TDM Measures:** With 100 long-term and 12 short-term spaces proposed, the site's bicycle parking supply meets or exceeds the City's Zoning By-Law requirement.

  The applicant will consider developing marketing/informational materials as part of their initial scope of work. Information on transportation options and/or links to the appropriate website should be conveyed to all prospective residents as a component of a resident welcome packet.

  Available information should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

  As the development promotes the use of other modes of transportation through limited on-site parking that will meet the projected demand, the development plays a significant role in setting an example for residents and visitors to consider non-automotive travel.

- This is an important factor as residents are notified at the onset of the project that parking is proposed to be provided as an additional cost in lieu of the price to rent a unit. If residents are significantly considering changing their travel behaviour, the cost of renting a parking space could be a contributing factor to this change. The development will consider the use of unbundled parking.

8.2 Recommendations

Based on the findings of this study, it is recommended that:

- Driveway 2 should be limited to an outbound driveway only.
- The Applicant implement TDM measures as discussed within this report to curb it dependency on vehicular traffic and create a balanced needs approach that encourages alternative modes of transportation rather that focusing solely on vehicle operations.
- A minimum of six spaces be allocated to visitors and the visitors parking supply be shared between the residential and retail visitors.
- It is suggested that the City of Burlington consider enhanced pedestrian and cycling facilities within their complete streets design for Lakeshore Road detailed in **Section 4.3**.

Appendix A

Terms of Reference

Creighton Chartier

From: Adiga, Smeeta <Smeeta.Adiga@burlington.ca>
Sent: November 27, 2024 3:48 PM
To: Lucas, Sandra; Creighton Chartier
Cc: Scott Catton; Amir@rosseaudevelopmentcorp.com
Subject: RE: (220617) 2083 Old Lakeshore Road - TIS - Scope of Work

Hi Creighton,

Thank you for your patience. Please note that the City's comments on the Terms of Reference, dated March 2023 remain applicable. In addition, a Multimodal Level of Service (MMLOS) analysis will be required as a part of the Transportation Impact Study (TIS).

MMOLS Analysis:

1. Given that the location falls within an Enhanced Pedestrian Realm, a Multimodal Level of Service (MMLOS) analysis is necessary. This analysis must assess the benefits of the "Complete Streets" design option on Lakeshore Road.
2. The MMLOS shall include evaluations for the following modes at the study area intersections:
    a) Pedestrian Level of Service (PLOS): This will assess sidewalk width and condition, crossing safety, accessibility, and pedestrian delay.
    b) Bicycle Level of Service (BLOS): This will consider the presence and quality of bike lanes, intersection designs for cyclists, traffic stress levels, connectivity, and access.
    c) Transit Level of Service (TLOS): This will evaluate transit stop accessibility and comfort, transit travel time and delays, service frequency and reliability, as well as transfer points and interconnectivity.

3. MMLOS Analysis Tool:

LOS Target						
Street Name	Street Type	LOS Per Mode Type				
		Pedestrian	Bikes	Transit	Trucks	Cars
Lakeshore Road	Urban Main Street	C	C	D	D	D
	Adjusted Targets	B	C	C	D	D
Martha Street and Pearl Street	Downtown Avenue	B	C	D	D	D
	Adjusted Targets	A	B	D	D	D

The OTC provides an MMLOS analysis tool to assess these targets. Please use this tool to meet the targeted LOS. https://otc.org/research-and-resources/mmlos-guide-jan-2022/

Thanks,

Smeeta Adiga (she/her)
Transportation Planning Technologist
Transportation Services Department

P. 905 335 7600, ext 7691
smeeta.adiga@burlington.ca

426 Brant Street P.O. Box 5013, Burlington, Ontario, L7R 3Z6

City of Burlington | www.burlington.ca

Our working hours may be different. You are not obligated to reply outside of your typical working hours.

From: Creighton Chartier
Sent: November 6, 2024 2:59 PM
To: devapptransportationplanning@burlington.ca
Cc: Scott Catton <scatton@ptsl.com>; Amir@rosseaudevelopmentcorp.com
Subject: (220617) 2083 Old Lakeshore Road - TIS - Scope of Work

Hello,

Paradigm has been retained to prepare a transportation impact study for the proposed development of 2083 Old Lakeshore Road in the City of Burlington. The newest conceptual site plan is attached.

The comments below in red were provided by City staff on the original scope response in March 2023. Does City staff have any additional comments?

The concept plan includes approximately 195 apartment units and 202 m^2 of ground floor retail space in a 27-storey building. The site's parking supply consists of approximately 209 spaces. Vehicle access is proposed by two private driveways to Old Lakeshore Road, the driveways form a pick-up/drop-off loop. Build-out date is TBD.

Proposed Terms of Reference

Study Guidelines:

- Generally follow Halton Region's Transportation Impact Study Guidelines
  Since the location is at the downtown corridor, Multimodal Level of service (MMLOS) analysis is required. The analysis must evaluate the benefits of "complete Streets" design option in Lakeshore Drive. Also, MMLOS analysis must identify the area where the transportation system needs improvement, prioritize investments in transportation infrastructure and inform transportation planning and policy decision.

Study Area Intersections:

- Lakeshore Road and Old Lakeshore Road (unsignalized) (Paradigm April – 2023);
- Lakeshore Road and Martha Street (unsignalized) (Paradigm April – 2023);
- Lakeshore Road and Pearl Street/Old Lakeshore Road (signalized) (Paradigm April – 2023); and
- The site driveways to Old Lakeshore Road.
- Include Elizabeth Street and Lakeshore Road. (Paradigm April – 2023) (this intersection may affect by the traffic generated by the proposed development.)

Analysis Periods:

- Weekday AM and PM peak hours

Existing Data:

Collect new Year 2023 TMC data for the above noted intersections. (Ensure the report included the existing traffic volumes and turning movements for all roadways and intersections with in the study area, including pedestrian, cyclist and heavy vehicle volumes.)

Horizon Year:

- Existing – Year 2024
- Five-years from the date the study – Year 2029

Analysis:

- Synchro 11 with HCM analysis
- Make sure the queuing assessment, including LOS and queuing distance are to be analyzed.
- Synchro analysis file must be submitted along with the report.

Site Circulation:

- AutoTURN Analysis for the following design vehicles:
  - TAC P
  - TAC MSU
  - Halton Front End Loading garbage Truck

Traffic Forecast:

- Background traffic annual growth rate of 1% per annum. -
- Adjacent Development applications
  - 374 Martha Street
  - 2069-2079 Lakeshore Road and 383-385 Pearl Street
  - 2107 Old Lakeshore Road and 2119 Lakeshore Road
  - 2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road
  - 2072 Lakeshore Road (adjacent lands at west end of football – land uses TBD)
  - **Please identify any others to be included**

  Please include
    - 2020 Lakeshore Dr (two mixed use tall buildings of max. of 35 storey)
    - 407 Martha Rd (26 storey condominium building with 240 units and 423 m2 commercial space)

TIS must also assess the effects of the site- generated transit demand on transit services and stops that will experience a ridership increase of 5% or more.

Trip Generation:

- ITE Trip Generation Data 11th Edition - The estimation of traffic volumes shall be based on full build-out condition and/or maximum land use intensity allowed.
- Preliminary trip generation
  - AM Peak Period – 62 total (21 in/41 out)
  - PM Peak Period – 74 total (41 in/33 out)
- No modal split reductions. - Agree

Trip Distribution:

- Existing Traffic Patterns - Agree

Future Road Improvements:

- **None, unless identified**

Remedial Measure:

- OTM Traffic Control signal warrants
- Left-Turn lane warrants

- Additional, Parking studies and strategies may include if the proposed parking does not adhere to the City of Burlington by-law requirements.

- Include Transportation Demand Management (TDM) and mitigation measures. Examine the feasibility of introducing a future bike rental/share hub around the location.

Report:

Report documenting the study methodologies, findings and conclusions.

Regards,

Creighton Chartier
Transportation Consultant
(He/Him)

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Appendix B

Existing Data

Lakeshore Rd @ Elizabeth St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Burlington
Site #: 0000000004
Intersection: Lakeshore Rd & Elizabeth St
TFR File #: 4
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	99
North Entering:	48
North Peds:	6
Peds Cross:	⋈

Heavys	4	1	3	8
Trucks	0	0	0	0
Cars	34	1	5	40
Totals	38	2	8	

Heavys	1
Trucks	2
Cars	48
Totals	51

East Leg Total:	1216
East Entering:	463
East Peds:	6
Peds Cross:	⧖

Elizabeth St

Heavys	Trucks	Cars	Totals
17	4	481	502

Lakeshore Rd

Cars	Trucks	Heavys	Totals
11	1	1	13
423	4	13	440
9	1	0	10
443	6	14	

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Heavys	Trucks	Cars	Totals
0	1	32	33
8	9	714	731
0	0	15	15
8	10	761	

Lakeshore Rd

Cars	Trucks	Heavys	Totals
732	10	11	753

Elizabeth St

Peds Cross:	⧖
West Peds:	7
West Entering:	779
West Leg Total:	1281

Cars	25			
Trucks	1			
Heavys	1			
Totals	27			

Cars	24	5	13	42
Trucks	0	0	1	1
Heavys	0	0	0	0
Totals	24	5	14	

Peds Cross:	⋈
South Peds:	12
South Entering:	43
South Leg Total:	70

Comments

Lakeshore Rd @ Elizabeth St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

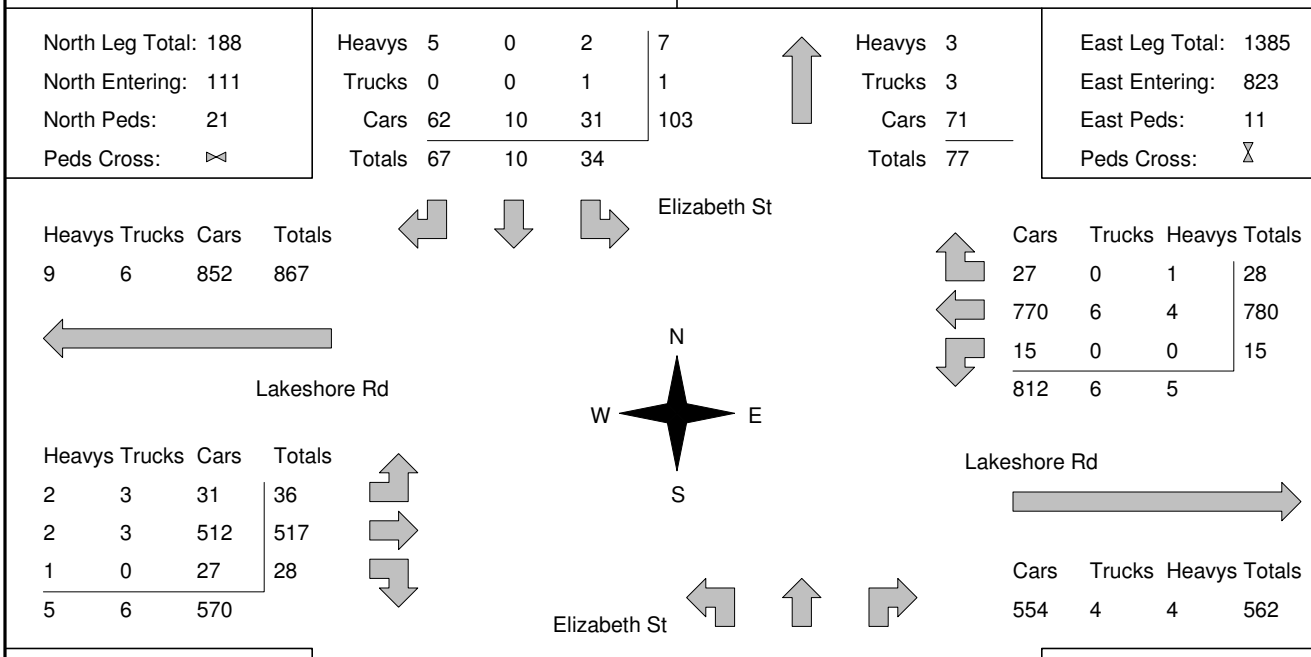
Municipality: Burlington
Site #: 0000000004
Intersection: Lakeshore Rd & Elizabeth St
TFR File #: 4
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Elizabeth St

Total Count Diagram

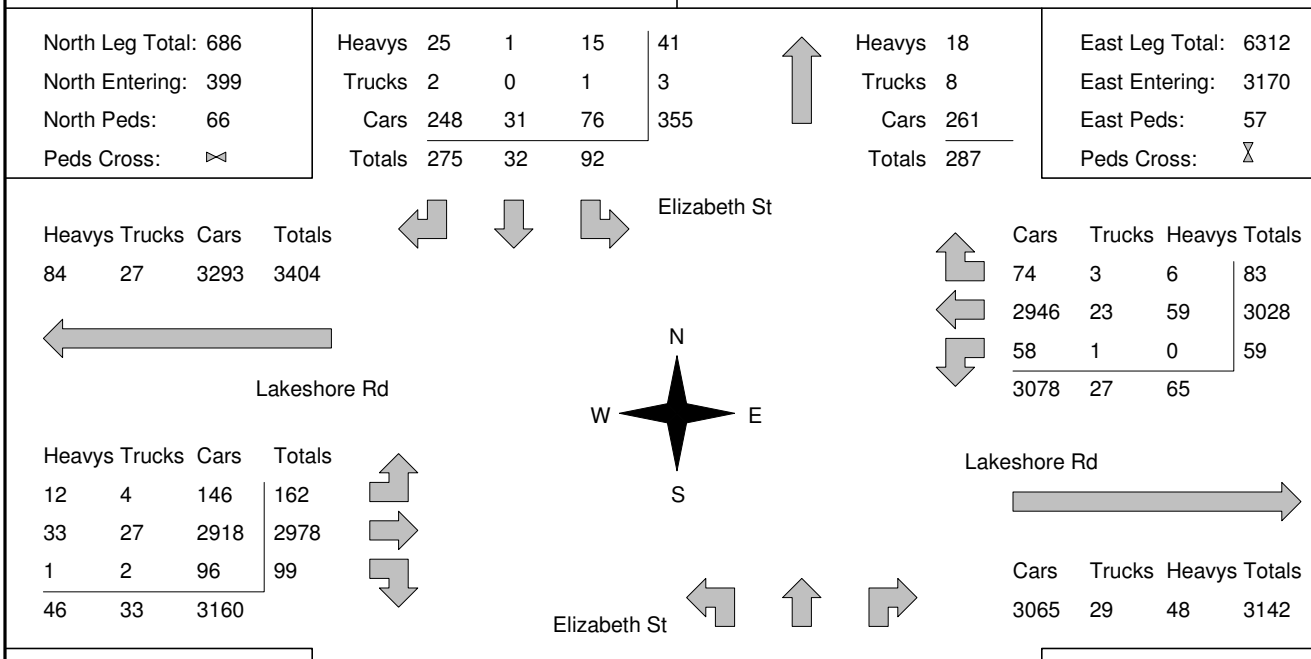
Municipality: Burlington
Site #: 0000000004
Intersection: Lakeshore Rd & Elizabeth St
TFR File #: 4
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Martha St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

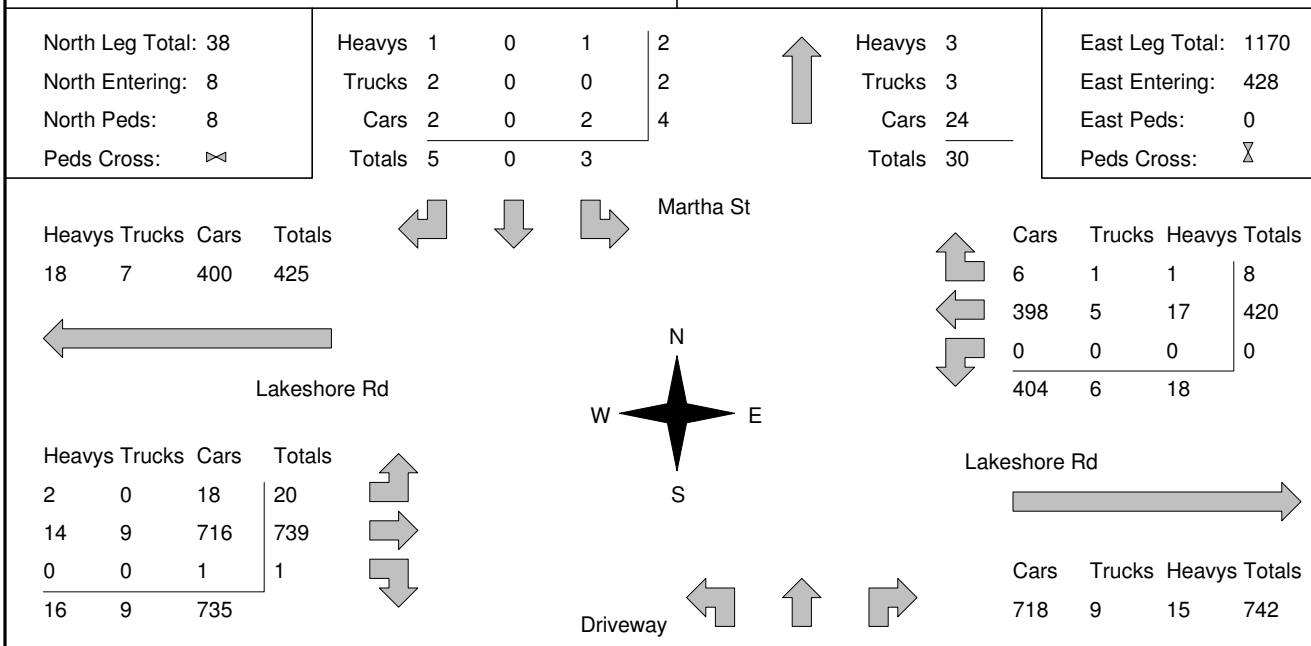
Municipality: Burlington
Site #: 0000000002
Intersection: Lakeshore Rd & Martha St
TFR File #: 2
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Martha St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

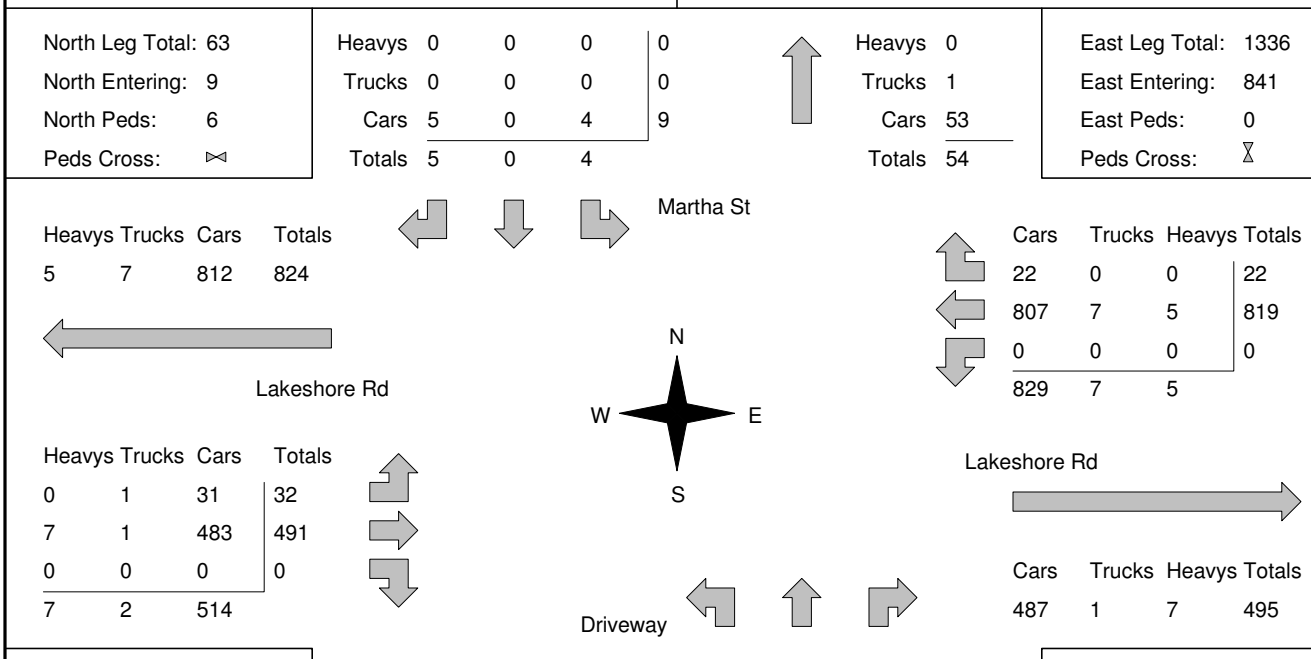
Municipality: Burlington
Site #: 0000000002
Intersection: Lakeshore Rd & Martha St
TFR File #: 2
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Martha St

Total Count Diagram

Municipality: Burlington
Site #: 0000000002
Intersection: Lakeshore Rd & Martha St
TFR File #: 2
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	263
North Entering:	60
North Peds:	42
Peds Cross:	⋈

Heavys	1	0	1	2
Trucks	4	1	0	5
Cars	32	0	21	53
Totals	37	1	22	

Heavys	6
Trucks	7
Cars	190
Totals	203

East Leg Total:	5857
East Entering:	3045
East Peds:	1
Peds Cross:	⧖

Martha St

Heavys	Trucks	Cars	Totals
65	27	2923	3015

Cars	Trucks	Heavys	Totals
63	2	2	67
2891	23	64	2978
0	0	0	0
2954	25	66	

Lakeshore Rd

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Heavys	Trucks	Cars	Totals
4	1	127	132
40	26	2724	2790
0	0	2	2
44	27	2853	

Lakeshore Rd

Cars	Trucks	Heavys	Totals
2745	26	41	2812

Driveway

Peds Cross:	⧖
West Peds:	38
West Entering:	2924
West Leg Total:	5939

Cars	2			
Trucks	1			
Heavys	0			
Totals	3			

Cars	0	0	0	0
Trucks	0	4	0	4
Heavys	0	0	0	0
Totals	0	4	0	

Peds Cross:	⋈
South Peds:	4
South Entering:	4
South Leg Total:	7

Comments

Lakeshore Rd @ Old Lakeshore Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Burlington
Site #: 0000000001
Intersection: Lakeshore Rd & Old Lakeshore Rd
TFR File #: 1
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	0			
North Entering:	0			
North Peds:	8			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	0	
Heavys	0			
Trucks	0			
Cars	0			
Totals	0			
East Leg Total:	1103			
East Entering:	391			
East Peds:	2			
Peds Cross:	⧖			

Driveway

Heavys	Trucks	Cars	Totals
20	5	371	396

Cars	Trucks	Heavys	Totals
0	0	0	0
371	5	10	386
5	0	0	5
376	5	10	

Lakeshore Rd

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Heavys	Trucks	Cars	Totals
0	0	0	0
16	9	683	708
0	0	1	1
16	9	684	

Lakeshore Rd

Cars	Trucks	Heavys	Totals
687	9	16	712

Old Lakeshore Rd

Peds Cross:	⧖			
West Peds:	0			
West Entering:	709			
West Leg Total:	1105			
Cars	6			
Trucks	0			
Heavys	0			
Totals	6			
Cars	0	0	4	4
Trucks	0	0	0	0
Heavys	10	0	0	10
Totals	10	0	4	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	14			
South Leg Total:	20			

Comments

Lakeshore Rd @ Old Lakeshore Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

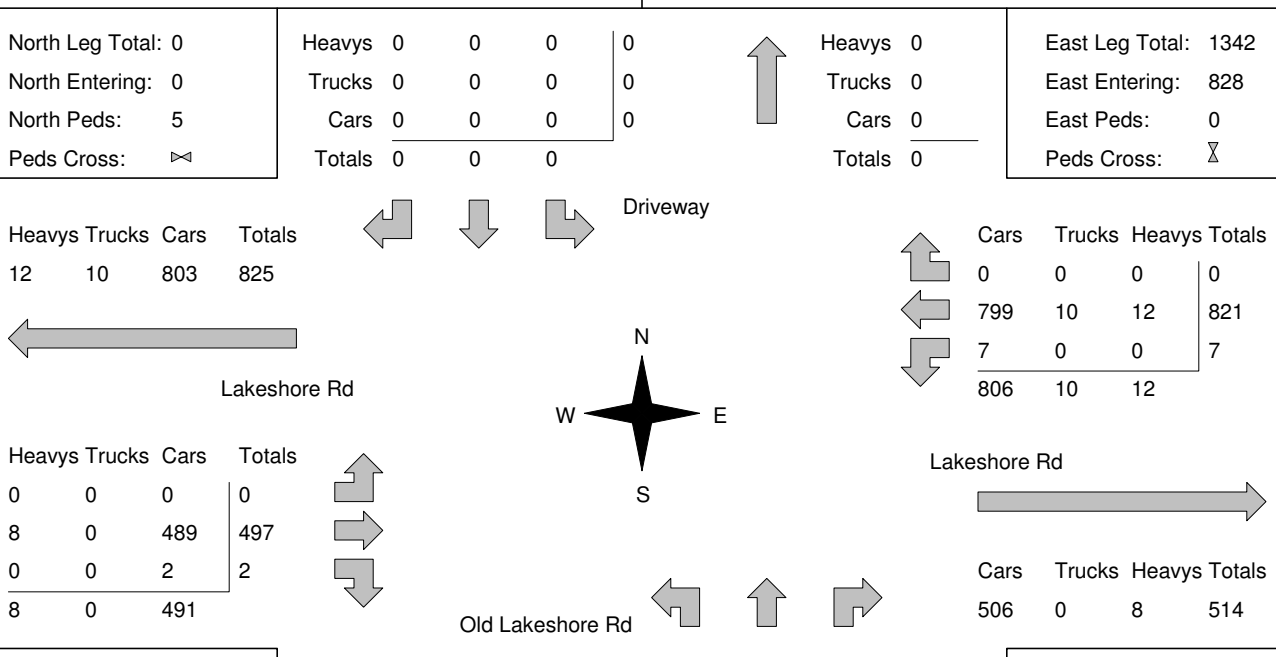
Municipality: Burlington
Site #: 0000000001
Intersection: Lakeshore Rd & Old Lakeshore Rd
TFR File #: 1
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Old Lakeshore Rd

Total Count Diagram

Municipality: Burlington
Site #: 0000000001
Intersection: Lakeshore Rd & Old Lakeshore Rd
TFR File #: 1
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	0
North Entering:	0
North Peds:	40
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	0	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	5895
East Entering:	3079
East Peds:	8
Peds Cross:	⧖

Driveway

Heavys	Trucks	Cars	Totals
66	29	2929	3024

Cars	Trucks	Heavys	Totals
0	0	0	0
2914	29	49	2992
86	0	1	87
3000	29	50	

Lakeshore Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
38	27	2664	2729
0	0	6	6
38	27	2670	

Lakeshore Rd

Cars	Trucks	Heavys	Totals
2749	27	40	2816

Old Lakeshore Rd

Peds Cross:	⧖
West Peds:	0
West Entering:	2735
West Leg Total:	5759

Cars	92			
Trucks	0			
Heavys	1			
Totals	93			

Cars	15	0	85	100
Trucks	0	0	0	0
Heavys	17	0	2	19
Totals	32	0	87	

Peds Cross:	⋈
South Peds:	5
South Entering:	119
South Leg Total:	212

Comments

Lakeshore Rd @ Pearl St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

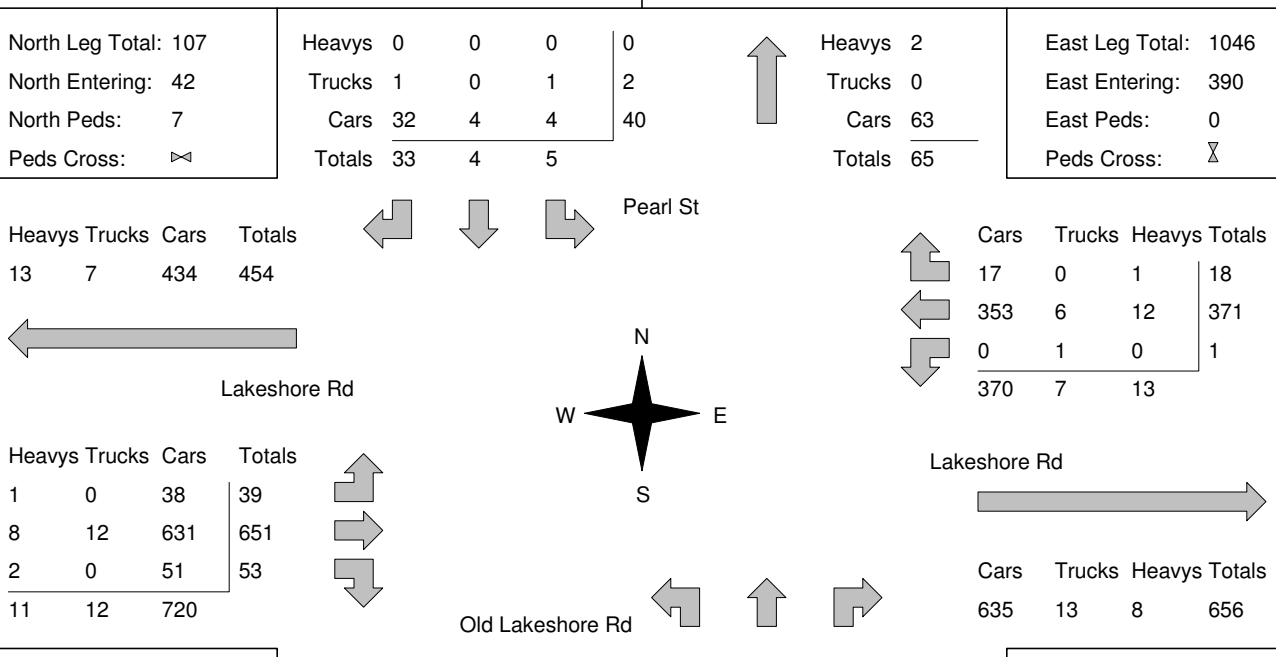
Municipality: Burlington
Site #: 0000000003
Intersection: Lakeshore Rd & Pearl St
TFR File #: 3
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Pearl St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

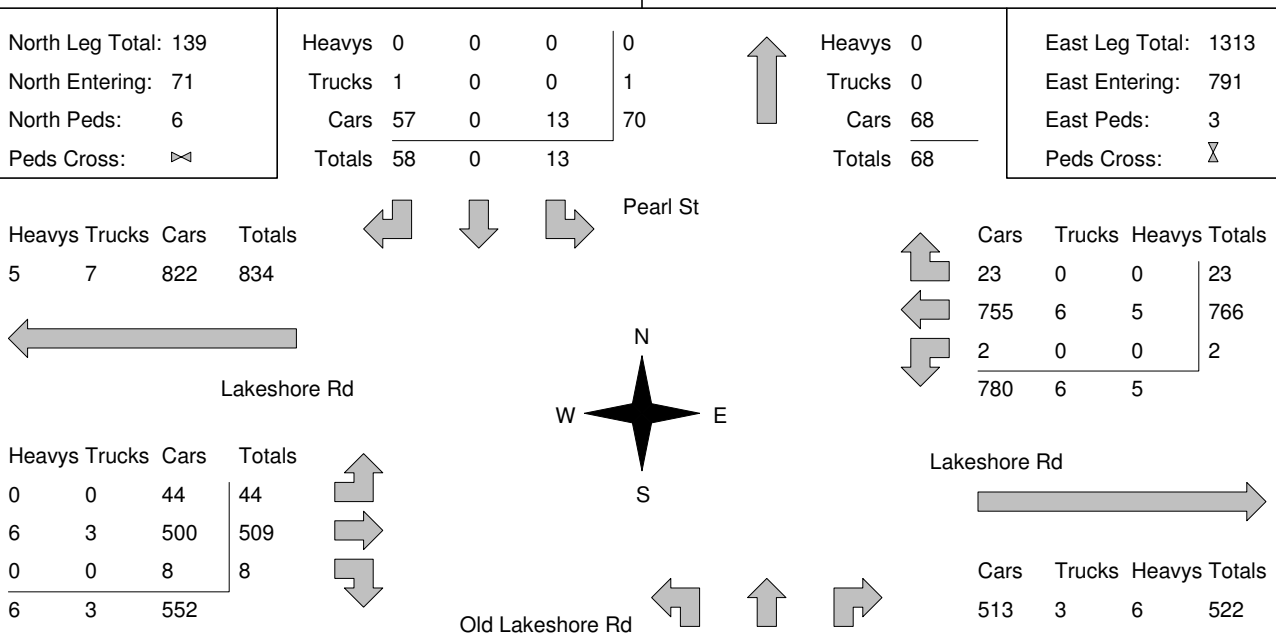
Municipality: Burlington
Site #: 0000000003
Intersection: Lakeshore Rd & Pearl St
TFR File #: 3
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E



Comments

Lakeshore Rd @ Pearl St

Total Count Diagram

Municipality: Burlington
Site #: 0000000003
Intersection: Lakeshore Rd & Pearl St
TFR File #: 3
Count date: 18-Apr-2023

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Lakeshore Rd runs W/E

North Leg Total:	601
North Entering:	296
North Peds:	44
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	3	0	3	6
Cars	236	9	45	290
Totals	239	9	48	

Heavys	2
Trucks	1
Cars	302
Totals	305

East Leg Total:	5836
East Entering:	2953
East Peds:	22
Peds Cross:	⧖

Pearl St

Heavys	Trucks	Cars	Totals
63	30	3101	3194

Cars	Trucks	Heavys	Totals
93	1	1	95
2763	26	62	2851
5	1	1	7
2861	28	64	

Lakeshore Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	194	195
39	30	2764	2833
8	0	85	93
48	30	3043	

Lakeshore Rd

Cars	Trucks	Heavys	Totals
2811	33	39	2883

Old Lakeshore Rd

Peds Cross:	⧖
West Peds:	15
West Entering:	3121
West Leg Total:	6315

Cars	99
Trucks	1
Heavys	9
Totals	109

Cars	102	15	2	119
Trucks	1	0	0	1
Heavys	1	0	0	1
Totals	104	15	2	

Peds Cross:	⋈
South Peds:	16
South Entering:	121
South Leg Total:	230

Comments

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Lakeshore Rd @ Elizabeth St	211	2	ACS/3	172.24.42.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		PT
12	2022	6	29	Increased FDW with new field measurements and walking speed of 0.9m/s	

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	EB - Lakeshore Rd	Ph6	WB - Lakeshore Rd
Ph3		Ph7	
Ph4	NB - Elizabeth St	Ph8	SB - Elizabeth St

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use	X	X		X		X		X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8		8		8
Walk		16		8		16		8
Ped. Clearance		18		21		18		21
Pedestrian Carry Over								
Vehicle Extension		3		3		3		3
MAX 1		35		30		35		30
MAX 2		35		30		35		30
Yellow Change		4		4		4		4
Red Clearance		3		3		3		3
Phase Minimum:	1	42	1	37	1	42	1	37

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN

* - 3 - 2, - 3 - 3

11

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	49	1	1	11	63		36		74		36
2	100	46	1	2	11	53		36		64		36
3	120	56	1	3	11	73		36		84		36
4	90	84	1	4	0	49		41		49		41
10	0	0	1	10		0		0		0		0

TIME BASE: ACTION PLAN, DAY PLAN

* - 5 - 2, - 5 - 3, -5 - 4

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan	
1	1	4	06:30	4	1	
1	1	1	07:00	1	1	Schedule 1 = Day Plan 1
1	1	2	09:00	8	1	Schedule 2 = Day Plan 2
1	1	3	15:30	9	1	Schedule 3 = Day Plan 3
1	1	4	19:00	4	1	
1	1	10	20:30	254	1	Day Plan 1 (Weekday)
2	2	1	07:00	1	1	Day Plan 2 (Saturday)
2	2	10	23:00	254	1	Day Plan 3 (Sunday, Holidays)
3	3	1	8:30	1	1	
3	3	10	22:00	254	1	Action Plan 10 = free (254)

Special Programming:

Phase 1 omitted during Pattern 4

TIME BASE DATA - TIME OF YEAR EVENTS

* - 5 - 5

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Lakeshore Rd @ Pearl St	212	2	ACS/3	172.24.43.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		PT
11	2022	6	29	Increased FDW with new field measurements and walking speed of 0.9m/s	
				Updated max splits	

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	EB - Lakeshore Rd	Ph6	WB - Lakeshore Rd
Ph3		Ph7	
Ph4	NB - Pearl St	Ph8	SB - Pearl St

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use		X		X		X		X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8		8		8
Walk		16		8		16		8
Ped. Clearance		17		17		17		17
Pedestrian Carry Over								
Vehicle Extension		3		3		3		3
MAX 1		35		25		35		25
MAX 2		35		25		35		25
Yellow Change		4		4		4		4
Red Clearance		3		3		3		3
Phase Minimum:	1	41	1	33	1	41	1	33

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	49	1	1		77		33		77		33
2	100	44	1	2		67		33		67		33
3	120	51	1	3		87		33		87		33
4	90	88	1	4		57		33		57		33
10	0	0	1	10		0		0		0		0

TIME BASE: ACTION PLAN, DAY PLAN * - 5 - 2, - 5 - 3, -5 - 4

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan	
1	1	4	06:30	4	1	
1	1	1	07:00	1	1	Schedule 1 = Day Plan 1
1	1	2	09:00	2	1	Schedule 2 = Day Plan 2
1	1	3	15:30	3	1	Schedule 3 = Day Plan 3
1	1	4	19:00	4	1	
1	1	10	20:30	254	1	Day Plan 1 (Weekday)
2	2	1	07:00	1	1	Day Plan 2 (Saturday)
2	2	10	20:30	254	1	Day Plan 3 (Sunday, Holidays)
3	3	1	8:30	1	1	
3	3	10	20:30	254	1	Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS * - 5 - 5

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Appendix C

Base Year Traffic Operations

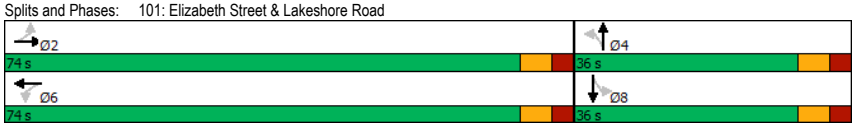


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	738	15	10	444	13	24	5	14	8	2	38
Future Volume (vph)	33	738	15	10	444	13	24	5	14	8	2	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		0.99	1.00			0.99		0.99	0.98	
Frt		0.997			0.996			0.955			0.857	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1694	3527	0	1586	3444	0	0	1715	0	1264	1416	0
Flt Permitted	0.477			0.348				0.804		0.842		
Satd. Flow (perm)	846	3527	0	578	3444	0	0	1411	0	1113	1416	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			5			15			40	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Adj. Flow (vph)	35	777	16	11	467	14	25	5	15	8	2	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	793	0	11	481	0	0	45	0	8	42	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Split (%)	67.3%	67.3%		67.3%	67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	67.0	67.0		67.0	67.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	78.2	78.2		78.2	78.2			11.5		11.5	11.5	
Actuated g/C Ratio	0.87	0.87		0.87	0.87			0.13		0.13	0.13	
v/c Ratio	0.05	0.26		0.02	0.16			0.23		0.06	0.20	
Control Delay	2.3	2.2		2.5	2.0			29.2		35.4	14.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.3	2.2		2.5	2.0			29.2		35.4	14.7	
LOS	A	A		A	A			C		D	B	
Approach Delay		2.2			2.0			29.2			18.0	
Approach LOS		A			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 90			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 3.5		Intersection LOS: A	
Intersection Capacity Utilization 47.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 101: Elizabeth Street & Lakeshore Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	35	793	11	481	45	8	42
v/c Ratio	0.05	0.26	0.02	0.16	0.23	0.06	0.20
Control Delay	2.3	2.2	2.5	2.0	29.2	35.4	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	2.2	2.5	2.0	29.2	35.4	14.7
Queue Length 50th (m)	1.1	15.4	0.3	8.4	5.1	1.3	0.3
Queue Length 95th (m)	3.2	23.6	1.5	13.7	15.0	5.4	9.7
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	735	3065	502	2993	511	395	529
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.26	0.02	0.16	0.09	0.02	0.08

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	738	15	10	444	13	24	5	14	8	2	38
Future Volume (vph)	33	738	15	10	444	13	24	5	14	8	2	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00			0.95		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1687	3527		1578	3443			1709		1258	1418	
Flt Permitted	0.48	1.00		0.35	1.00			0.80		0.84	1.00	
Satd. Flow (perm)	848	3527		577	3443			1412		1114	1418	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	777	16	11	467	14	25	5	15	8	2	40
RTOR Reduction (vph)	0	1	0	0	1	0	0	14	0	0	36	0
Lane Group Flow (vph)	35	792	0	11	480	0	0	31	0	8	6	0
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	73.5	73.5		73.5	73.5			5.2		5.2	5.2	
Effective Green, g (s)	76.5	76.5		76.5	76.5			8.2		8.2	8.2	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.09		0.09	0.09	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	699	2910		476	2841			124		98	125	
v/s Ratio Prot		c0.22			0.14						0.00	
v/s Ratio Perm	0.04			0.02				c0.02		0.01		
v/c Ratio	0.05	0.27		0.02	0.17			0.25		0.08	0.04	
Uniform Delay, d1	1.5	1.8		1.4	1.6			39.4		38.8	38.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.1	0.1			1.1		0.4	0.1	
Delay (s)	1.6	2.1		1.5	1.8			40.5		39.2	38.8	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.0			1.8			40.5			38.9	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	658	54	1	375	18	51	8	0	5	4	33
Future Volume (vph)	39	658	54	1	375	18	51	8	0	5	4	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00			0.99	
Frt		0.989			0.993						0.866	
Flt Protected	0.950			0.950				0.958		0.950		
Satd. Flow (prot)	1694	3456	0	1745	3407	0	0	1789	0	1454	1583	0
Flt Permitted	0.511			0.364				0.727		0.767		
Satd. Flow (perm)	905	3456	0	667	3407	0	0	1356	0	1174	1583	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		16			9							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	7		5	5		7	1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Adj. Flow (vph)	41	685	56	1	391	19	53	8	0	5	4	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	741	0	1	410	0	0	61	0	5	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	90.0	90.0		90.0	90.0			13.4		13.4	13.4	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.12		0.12	0.12	
v/c Ratio	0.05	0.26		0.00	0.14			0.36		0.03	0.19	
Control Delay	2.8	2.7		3.0	2.4			49.0		39.8	43.6	
Queue Delay	0.0	0.3		0.0	0.0			0.0		0.0	0.0	
Total Delay	2.8	3.1		3.0	2.4			49.0		39.8	43.6	
LOS	A	A		A	A			D		D	D	
Approach Delay		3.1			2.4			49.0			43.1	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 107.4			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 6.4		Intersection LOS: A	
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

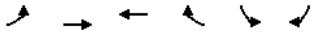


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	41	741	1	410	61	5	38
v/c Ratio	0.05	0.26	0.00	0.14	0.36	0.03	0.19
Control Delay	2.8	2.7	3.0	2.4	49.0	39.8	43.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	3.1	3.0	2.4	49.0	39.8	43.6
Queue Length 50th (m)	1.4	15.8	0.0	7.8	12.1	1.0	7.4
Queue Length 95th (m)	4.3	26.4	0.4	14.0	25.3	4.5	17.4
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	758	2898	558	2856	367	317	428
Starvation Cap Reductn	0	1463	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.52	0.00	0.14	0.17	0.02	0.09

Intersection Summary

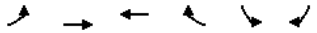
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	658	54	1	375	18	51	8	0	5	4	33
Future Volume (vph)	39	658	54	1	375	18	51	8	0	5	4	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			1.00		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1683	3455		1740	3408			1788		1454	1583	
Flt Permitted	0.51	1.00		0.36	1.00			0.73		0.77	1.00	
Satd. Flow (perm)	906	3455		667	3408			1356		1174	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	41	685	56	1	391	19	53	8	0	5	4	34
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	41	738	0	1	408	0	0	61	0	5	38	0
Confl. Peds. (#/hr)	7		5	5		7	1					1
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	86.1	86.1		86.1	86.1			8.7		8.7	8.7	
Effective Green, g (s)	89.1	89.1		89.1	89.1			11.7		11.7	11.7	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.11		0.11	0.11	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	741	2829		546	2790			145		126	170	
v/s Ratio Prot		c0.21			0.12						0.02	
v/s Ratio Perm	0.05			0.00				c0.04		0.00		
v/c Ratio	0.06	0.26		0.00	0.15			0.42		0.04	0.22	
Uniform Delay, d1	1.9	2.3		1.8	2.0			45.4		43.5	44.4	
Progression Factor	1.00	1.00		1.00	1.00			1.01		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.0	0.1			2.0		0.1	0.7	
Delay (s)	2.0	2.5		1.8	2.1			47.6		43.6	45.1	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.5			2.1			47.6			44.9	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	746	424	8	3	5
Future Volume (vph)	20	746	424	8	3	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.910	
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1586	1845	1798	0	1533	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1586	1845	1798	0	1533	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	8			8		10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	3%	5%	25%	33%	0%
Adj. Flow (vph)	22	829	471	9	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	829	480	0	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	746	424	8	3	5
Future Volume (Veh/h)	20	746	424	8	3	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	829	471	9	3	6
Pedestrians		10			8	
Lane Width (m)		3.5			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.91	
vC, conflicting volume	488				1356	494
vC1, stage 1 conf vol					484	
vC2, stage 2 conf vol					873	
vCu, unblocked vol	488				1343	494
tC, single (s)	4.2				6.7	6.2
tC, 2 stage (s)					5.7	
tF (s)	2.3				3.8	3.3
p0 queue free %	98				99	99
cM capacity (veh/h)	1028				307	571

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	22	829	480	9
Volume Left	22	0	0	3
Volume Right	0	0	9	6
cSH	1028	1700	1700	444
Volume to Capacity	0.02	0.49	0.28	0.02
Queue Length 95th (m)	0.5	0.0	0.0	0.5
Control Delay (s)	8.6	0.0	0.0	13.3
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	13.3
Approach LOS				B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		52.1%	ICU Level of Service	A
Analysis Period (min)		15		

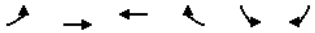
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	715	1	5	390	0	10	0	4	0	0	0
Future Volume (vph)	0	715	1	5	390	0	10	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.964				
Flt Protected				0.950				0.965				
Satd. Flow (prot)	1900	1845	0	1745	1827	0	0	1767	0	0	1900	0
Flt Permitted				0.950				0.965				
Satd. Flow (perm)	1900	1845	0	1745	1827	0	0	1767	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	8					8			2	2		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	786	1	5	429	0	11	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	787	0	5	429	0	0	15	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	715	1	5	390	0	10	0	4	0	0	0
Future Volume (Veh/h)	0	715	1	5	390	0	10	0	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	786	1	5	429	0	11	0	4	0	0	0
Pedestrians					2						8	
Lane Width (m)					3.5						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						1	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	437			787			1226	1234	788	1239	1234	437
vC1, stage 1 conf vol							786	786		447	447	
vC2, stage 2 conf vol							439	447		792	787	
vCu, unblocked vol	437			718			1199	1208	720	1214	1208	437
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	99	100	100	100
cM capacity (veh/h)	1126			814			341	349	393	331	346	620

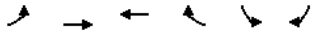
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	787	5	429	15	0
Volume Left	0	0	5	0	11	0
Volume Right	0	1	0	0	4	0
cSH	1700	1700	814	1700	353	1700
Volume to Capacity	0.00	0.46	0.01	0.25	0.04	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.0	1.1	0.0
Control Delay (s)	0.0	0.0	9.5	0.0	15.6	0.0
Lane LOS			A		C	A
Approach Delay (s)	0.0		0.1		15.6	0.0
Approach LOS					C	A

Intersection Summary					
Average Delay	0.2				
Intersection Capacity Utilization	48.3%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	59	59	0	0	0
Future Volume (vph)	0	59	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	64	64	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	64	64	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

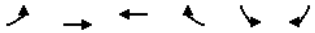
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	59	59	0	0	0
Future Volume (Veh/h)	0	59	59	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	64	64	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	64				128	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				128	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1538				866	1000

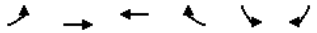
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	64	64	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1538	1700	1700
Volume to Capacity	0.00	0.04	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	59	59	0	0	0
Future Volume (vph)	0	59	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	64	64	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	64	64	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	59	59	0	0	0
Future Volume (Veh/h)	0	59	59	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	64	64	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	64				128	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				128	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1538				866	1000

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	64	64	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1538	1700	1700
Volume to Capacity	0.00	0.04	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

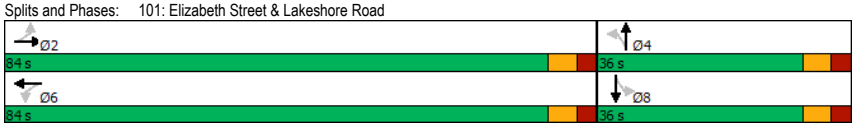
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	522	28	15	788	28	20	13	11	34	10	68
Future Volume (vph)	36	522	28	15	788	28	20	13	11	34	10	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	1.00			0.99		0.99	0.98	
Frt		0.992			0.995			0.968			0.869	
Flt Protected	0.950			0.950				0.978		0.950		
Satd. Flow (prot)	1531	3533	0	1745	3546	0	0	1788	0	1601	1521	0
Flt Permitted	0.324			0.436				0.790		0.807		
Satd. Flow (perm)	517	3533	0	793	3546	0	0	1436	0	1343	1521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			6			11			71	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Adj. Flow (vph)	38	544	29	16	821	29	21	14	11	35	10	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	573	0	16	850	0	0	46	0	35	81	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	84.0	84.0		84.0	84.0		36.0	36.0		36.0	36.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	77.0	77.0		77.0	77.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	84.1	84.1		84.1	84.1			12.0		12.0	12.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.12		0.12	0.12	
v/c Ratio	0.09	0.19		0.02	0.29			0.25		0.22	0.33	
Control Delay	2.9	2.3		2.4	2.6			36.0		43.2	16.0	
Queue Delay	0.0	0.0		0.0	0.4			0.0		0.0	0.0	
Total Delay	2.9	2.3		2.4	3.0			36.0		43.2	16.0	
LOS	A	A		A	A			D		D	B	
Approach Delay		2.3			3.0			36.0			24.2	
Approach LOS		A			A			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 100.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 101: Elizabeth Street & Lakeshore Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	38	573	16	850	46	35	81
v/c Ratio	0.09	0.19	0.02	0.29	0.25	0.22	0.33
Control Delay	2.9	2.3	2.4	2.6	36.0	43.2	16.0
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	2.9	2.3	2.4	3.0	36.0	43.2	16.0
Queue Length 50th (m)	1.2	10.3	0.5	17.0	6.6	6.6	1.8
Queue Length 95th (m)	3.9	17.3	2.0	27.4	17.5	16.3	15.6
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	433	2965	665	2975	465	428	533
Starvation Cap Reductn	0	0	0	1455	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.19	0.02	0.56	0.10	0.08	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	522	28	15	788	28	20	13	11	34	10	68
Future Volume (vph)	36	522	28	15	788	28	20	13	11	34	10	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99			0.97		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1516	3535		1730	3546			1779		1584	1523	
Flt Permitted	0.32	1.00		0.44	1.00			0.79		0.81	1.00	
Satd. Flow (perm)	517	3535		795	3546			1438		1345	1523	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	38	544	29	16	821	29	21	14	11	35	10	71
RTOR Reduction (vph)	0	2	0	0	1	0	0	10	0	0	64	0
Lane Group Flow (vph)	38	571	0	16	849	0	0	36	0	35	17	0
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	80.4	80.4		80.4	80.4			7.4		7.4	7.4	
Effective Green, g (s)	83.4	83.4		83.4	83.4			10.4		10.4	10.4	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10		0.10	0.10	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	423	2896		651	2905			146		137	155	
v/s Ratio Prot		0.16			c0.24						0.01	
v/s Ratio Perm	0.07			0.02				0.03		c0.03		
v/c Ratio	0.09	0.20		0.02	0.29			0.25		0.26	0.11	
Uniform Delay, d1	1.8	2.0		1.7	2.2			42.1		42.1	41.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.1	0.3			0.9		1.0	0.3	
Delay (s)	2.2	2.1		1.8	2.4			43.0		43.1	41.8	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.1			2.4			43.0			42.2	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	101.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	514	8	2	774	23	10	1	0	13	0	59
Future Volume (vph)	44	514	8	2	774	23	10	1	0	13	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Frt		0.998			0.996						0.850	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1745	3532	0	1745	3558	0	0	1816	0	1745	1562	0
Flt Permitted	0.328			0.447				0.738		0.750		
Satd. Flow (perm)	601	3532	0	818	3558	0	0	1401	0	1372	1562	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		3			6							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	46	541	8	2	815	24	11	1	0	14	0	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	549	0	2	839	0	0	12	0	14	62	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	90.9	90.9		90.9	90.9			13.1		13.1	13.1	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.12		0.12	0.12	
v/c Ratio	0.09	0.18		0.00	0.28			0.07		0.08	0.33	
Control Delay	3.0	2.5		2.5	2.8			42.4		41.7	47.7	
Queue Delay	0.0	0.3		0.0	0.0			0.0		0.0	0.0	
Total Delay	3.0	2.7		2.5	2.8			42.4		41.7	47.7	
LOS	A	A		A	A			D		D	D	
Approach Delay		2.7			2.8			42.4			46.6	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 108			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 51.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

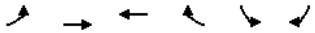


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	46	549	2	839	12	14	62
v/c Ratio	0.09	0.18	0.00	0.28	0.07	0.08	0.33
Control Delay	3.0	2.5	2.5	2.8	42.4	41.7	47.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	2.7	2.5	2.8	42.4	41.7	47.7
Queue Length 50th (m)	1.6	11.0	0.1	18.6	2.4	2.8	12.9
Queue Length 95th (m)	4.9	18.4	0.6	29.7	8.0	8.8	25.2
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	506	2973	688	2996	377	369	420
Starvation Cap Reductn	0	1670	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.42	0.00	0.28	0.03	0.04	0.15

Intersection Summary

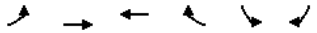
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	514	8	2	774	23	10	1	0	13	0	59
Future Volume (vph)	44	514	8	2	774	23	10	1	0	13	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1740	3531		1738	3557			1815		1738	1562	
Flt Permitted	0.33	1.00		0.45	1.00			0.74		0.75	1.00	
Satd. Flow (perm)	600	3531		817	3557			1400		1372	1562	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	541	8	2	815	24	11	1	0	14	0	62
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	548	0	2	838	0	0	12	0	14	62	0
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	87.0	87.0		87.0	87.0			8.4		8.4	8.4	
Effective Green, g (s)	90.0	90.0		90.0	90.0			11.4		11.4	11.4	
Actuated g/C Ratio	0.82	0.82		0.82	0.82			0.10		0.10	0.10	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	493	2904		672	2926			145		142	162	
v/s Ratio Prot		0.16			c0.24						c0.04	
v/s Ratio Perm	0.08			0.00				0.01		0.01		
v/c Ratio	0.09	0.19		0.00	0.29			0.08		0.10	0.38	
Uniform Delay, d1	1.9	2.0		1.7	2.3			44.3		44.3	45.7	
Progression Factor	1.00	1.00		1.00	1.00			1.03		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.2			0.2		0.3	1.5	
Delay (s)	2.2	2.2		1.7	2.5			45.7		44.7	47.2	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.2			2.5			45.7			46.8	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	32	496	827	22	4	5
Future Volume (vph)	32	496	827	22	4	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1694	1863	1874	0	1719	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1694	1863	1874	0	1719	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	6			6		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	2%	1%	0%	0%	0%
Adj. Flow (vph)	33	517	861	23	4	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	517	884	0	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	496	827	22	4	5
Future Volume (Veh/h)	32	496	827	22	4	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	517	861	23	4	5
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.94	
vC, conflicting volume	890				1462	878
vC1, stage 1 conf vol					878	
vC2, stage 2 conf vol					583	
vCu, unblocked vol	890				1459	878
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				99	99
cM capacity (veh/h)	753				339	348

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	517	884	9
Volume Left	33	0	0	4
Volume Right	0	0	23	5
cSH	753	1700	1700	344
Volume to Capacity	0.04	0.30	0.52	0.03
Queue Length 95th (m)	1.1	0.0	0.0	0.6
Control Delay (s)	10.0	0.0	0.0	15.7
Lane LOS	A			C
Approach Delay (s)	0.6		0.0	15.7
Approach LOS				C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

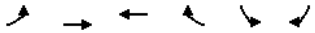
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	502	2	7	829	0	4	0	17	0	0	0
Future Volume (vph)	0	502	2	7	829	0	4	0	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.890				
Flt Protected				0.950				0.991				
Satd. Flow (prot)	1900	1861	0	1745	1845	0	0	1676	0	0	1900	0
Flt Permitted				0.950				0.991				
Satd. Flow (perm)	1900	1861	0	1745	1845	0	0	1676	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	5		1	1		5						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	534	2	7	882	0	4	0	18	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	536	0	7	882	0	0	22	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	502	2	7	829	0	4	0	17	0	0	0
Future Volume (Veh/h)	0	502	2	7	829	0	4	0	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	534	2	7	882	0	4	0	18	0	0	0
Pedestrians								1			5	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	887			537			1432	1437	536	1453	1438	887
vC1, stage 1 conf vol							536	536		901	901	
vC2, stage 2 conf vol							896	901		552	537	
vCu, unblocked vol	887			487			1428	1434	486	1451	1435	887
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	97	100	100	100
cM capacity (veh/h)	769			1032			293	309	556	285	308	345

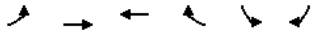
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	536	7	882	22	0
Volume Left	0	0	7	0	4	0
Volume Right	0	2	0	0	18	0
cSH	1700	1700	1032	1700	478	1700
Volume to Capacity	0.00	0.32	0.01	0.52	0.05	0.00
Queue Length 95th (m)	0.0	0.0	0.2	0.0	1.2	0.0
Control Delay (s)	0.0	0.0	8.5	0.0	12.9	0.0
Lane LOS			A		B	A
Approach Delay (s)	0.0		0.1		12.9	0.0
Approach LOS					B	A

Intersection Summary					
Average Delay	0.2				
Intersection Capacity Utilization	53.6%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	11	0	0	0
Future Volume (vph)	0	10	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	12	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	11	12	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

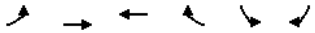
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	11	0	0	0
Future Volume (Veh/h)	0	10	11	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	12	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	12				23	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	12				23	12
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1607				993	1069

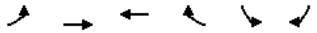
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	11	12	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	11	0	0	0
Future Volume (vph)	0	10	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	12	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	11	12	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	11	0	0	0
Future Volume (Veh/h)	0	10	11	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	12	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	12				23	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	12				23	12
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1607				993	1069

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	11	12	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

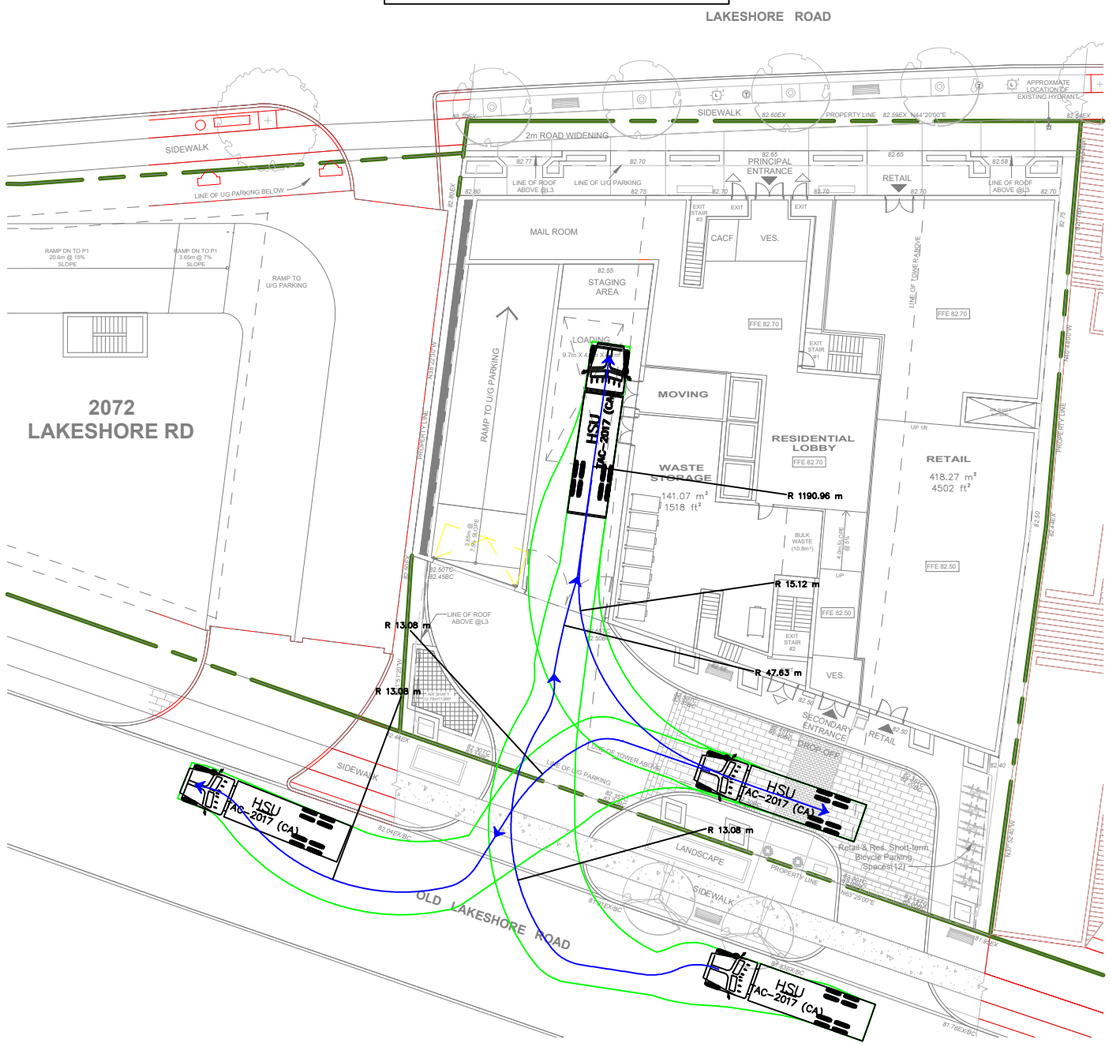
Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		6.7%	ICU Level of Service	A
Analysis Period (min)		15		

Appendix D

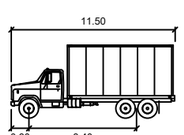
AutoTURN Analysis

THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

AT GRADE



DESIGN VEHICLE:



HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

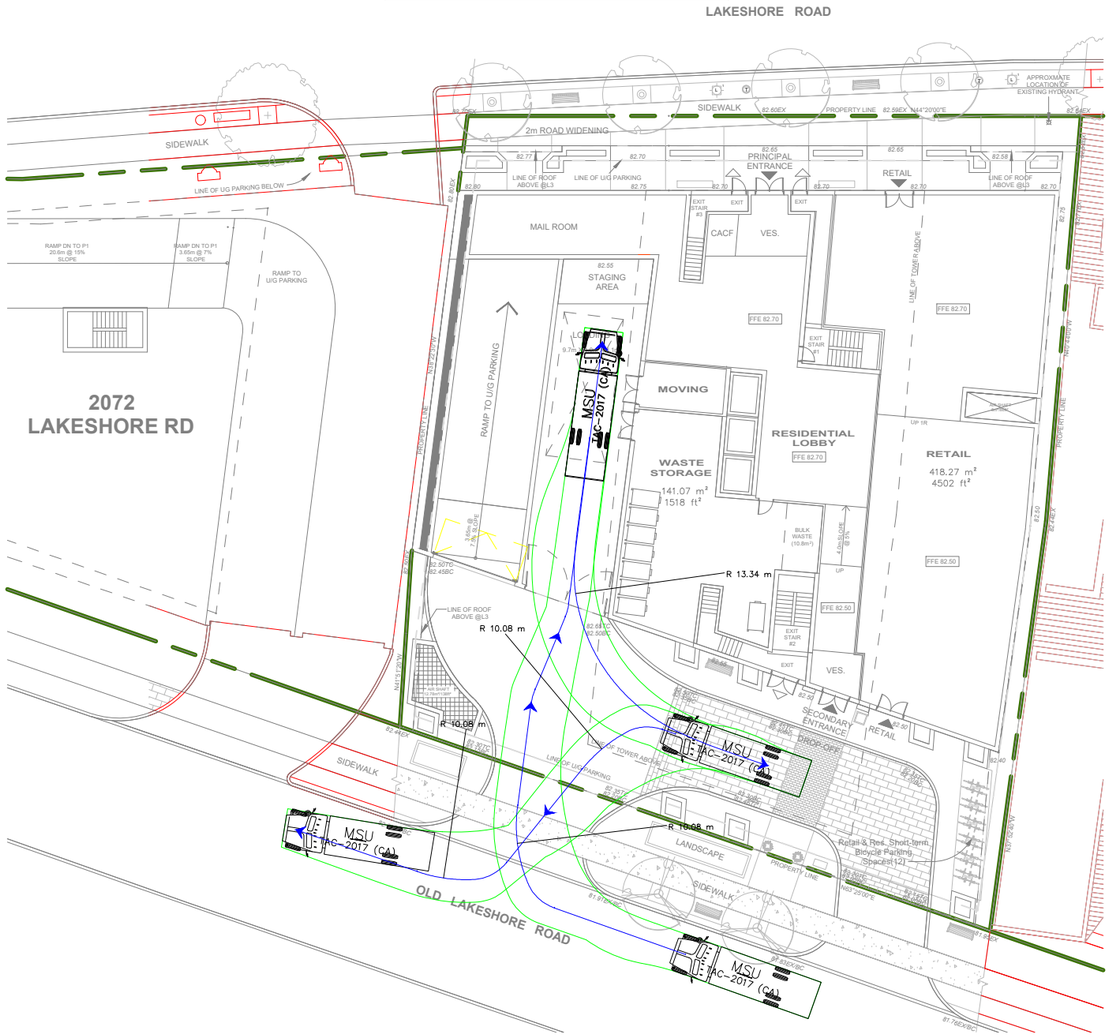
NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.:
DESIGN: LC	DRAWN: LC	CHECK: SC	01

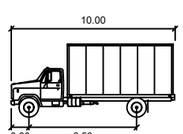
AT GRADE



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NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



MSU

	meters
Width	2.60
Track	2.60
Lock to Lock Time	6.0
Steering Angle	40.2

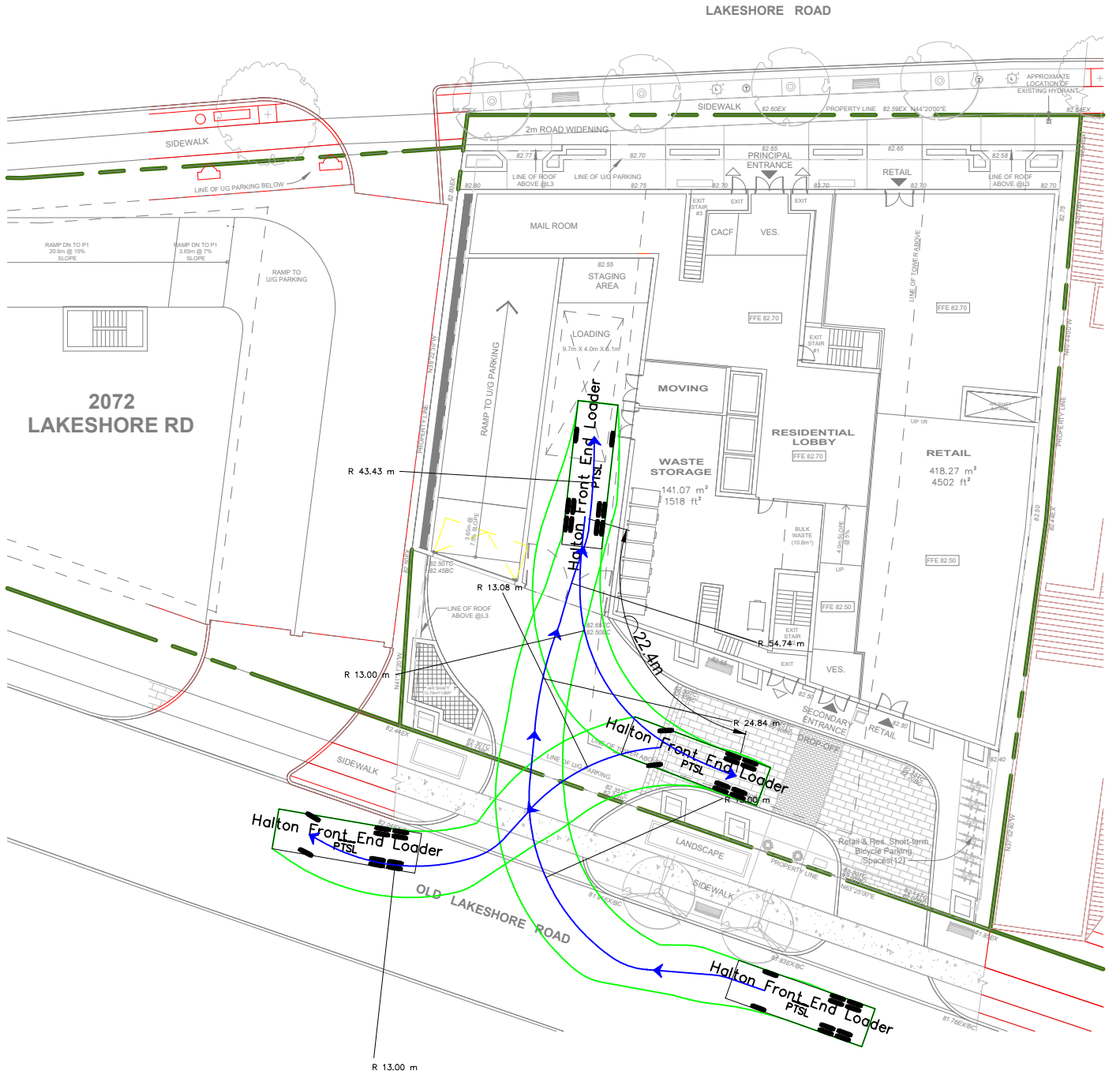
AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.: 02
DESIGN: LC	DRAWN: LC	CHECK: SC	

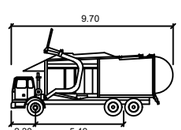
THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

AT GRADE



NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



Halton Front End Loader

meters

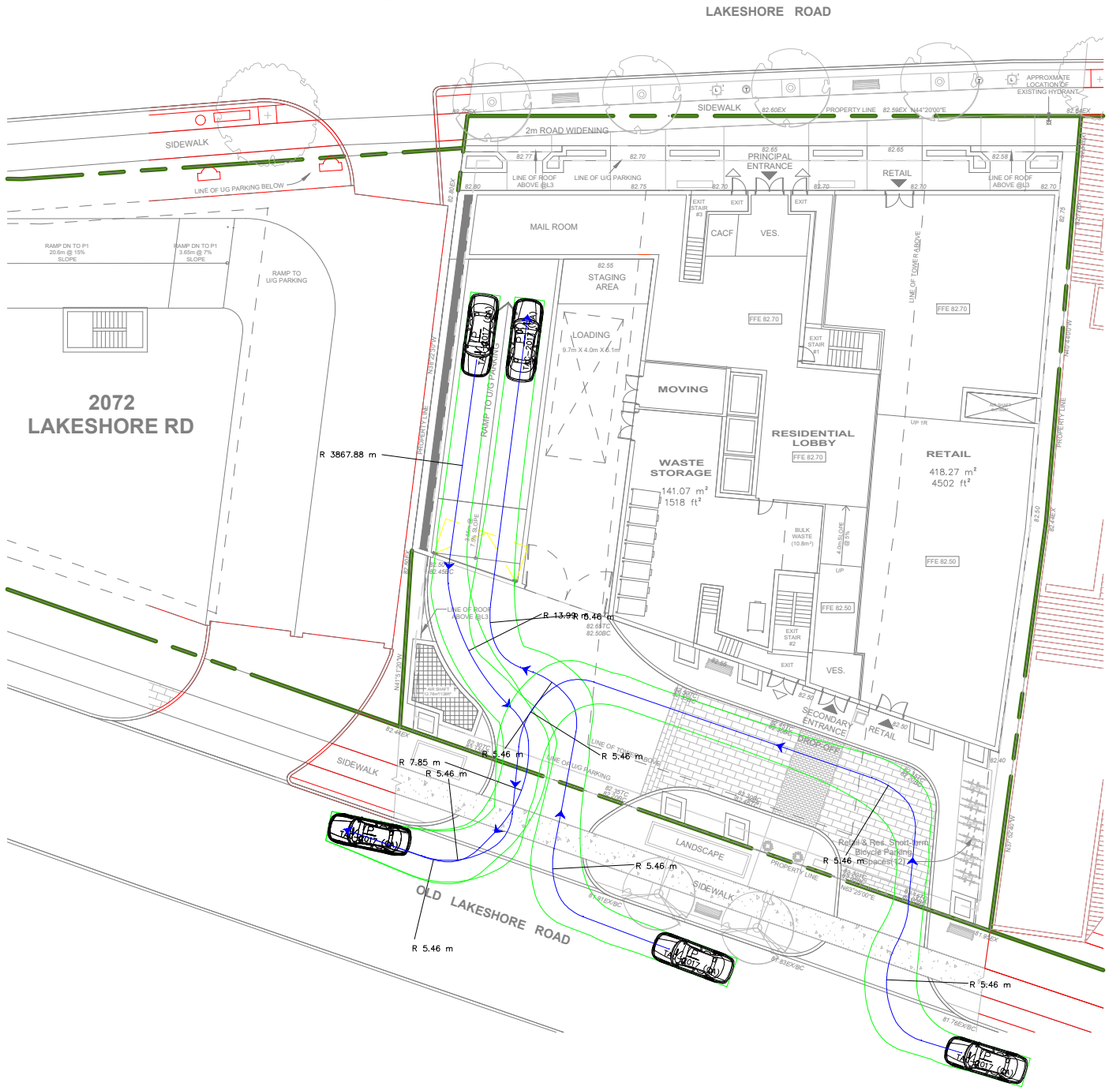
Width	: 2.70
Track	: 2.70
Lock to Lock Time	: 6.0
Steering Angle	: 28.0

AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.: 03
DESIGN: LC	DRAWN: LC	CHECK: SC	

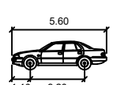
AT GRADE



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NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

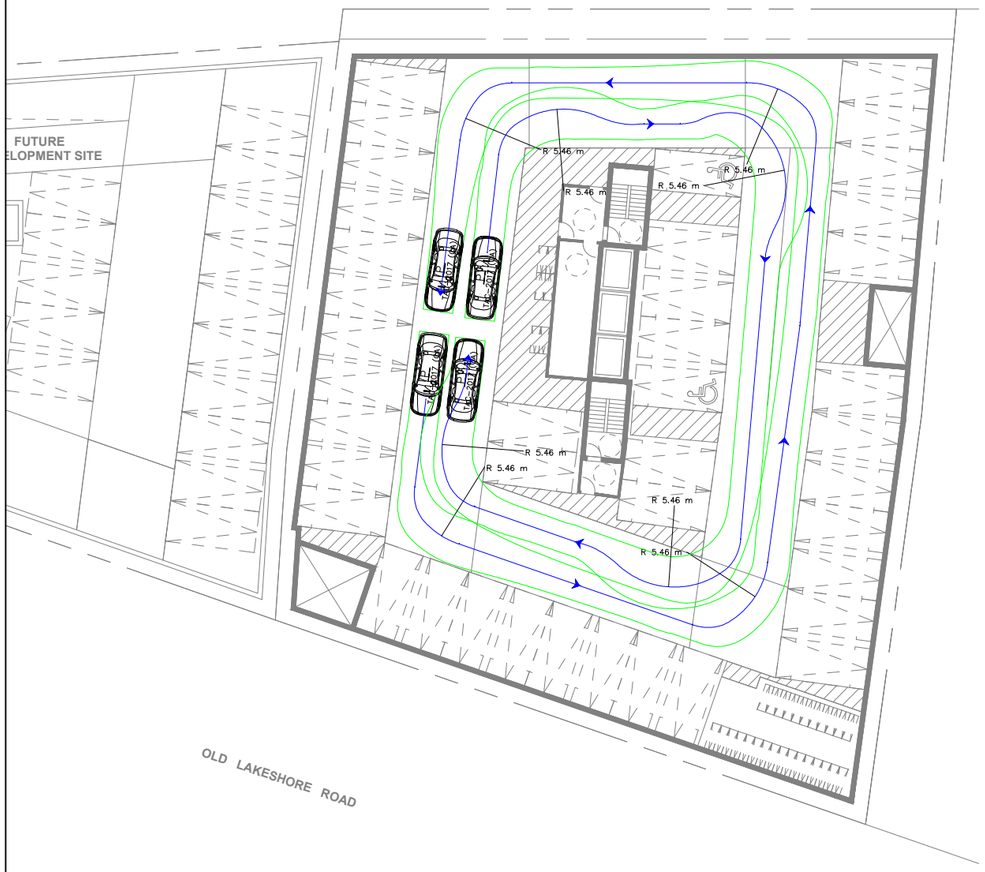
AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.: 04
DESIGN: LC	DRAWN: LC	CHECK: SC	

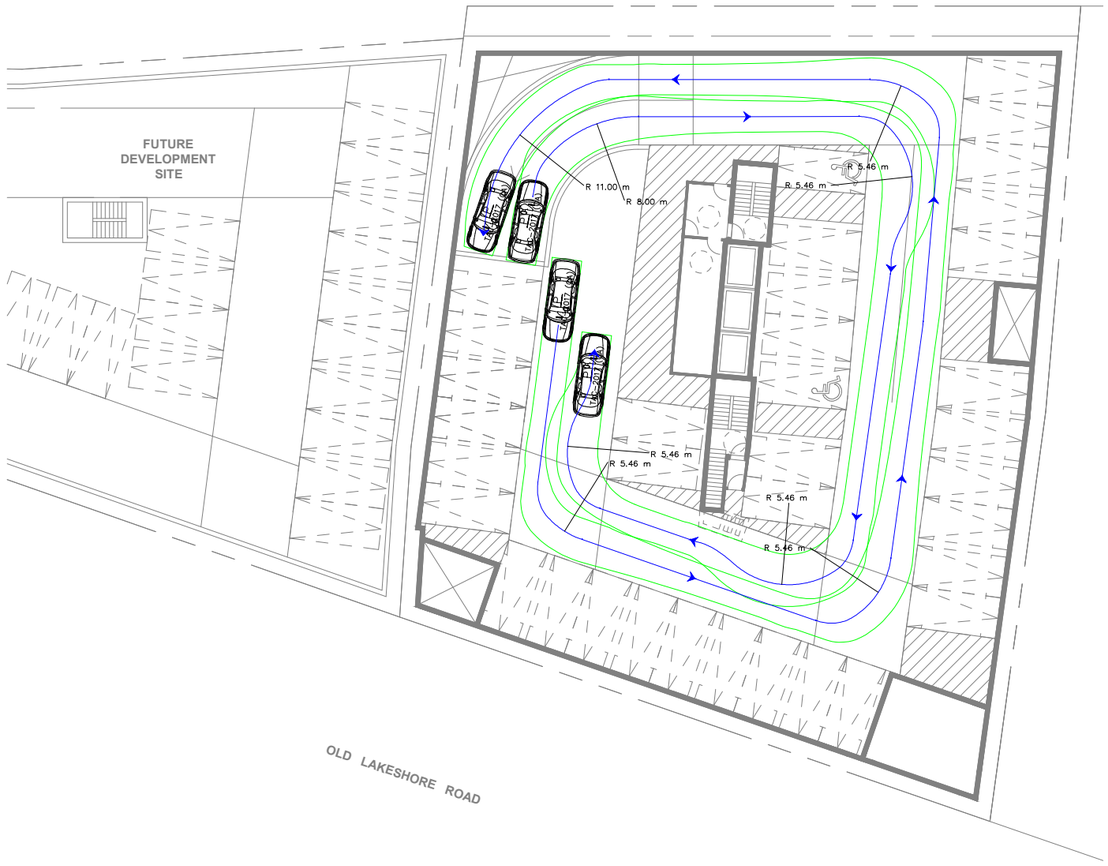
P2-P3

LAKESHORE ROAD



P1

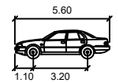
LAKESHORE ROAD



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

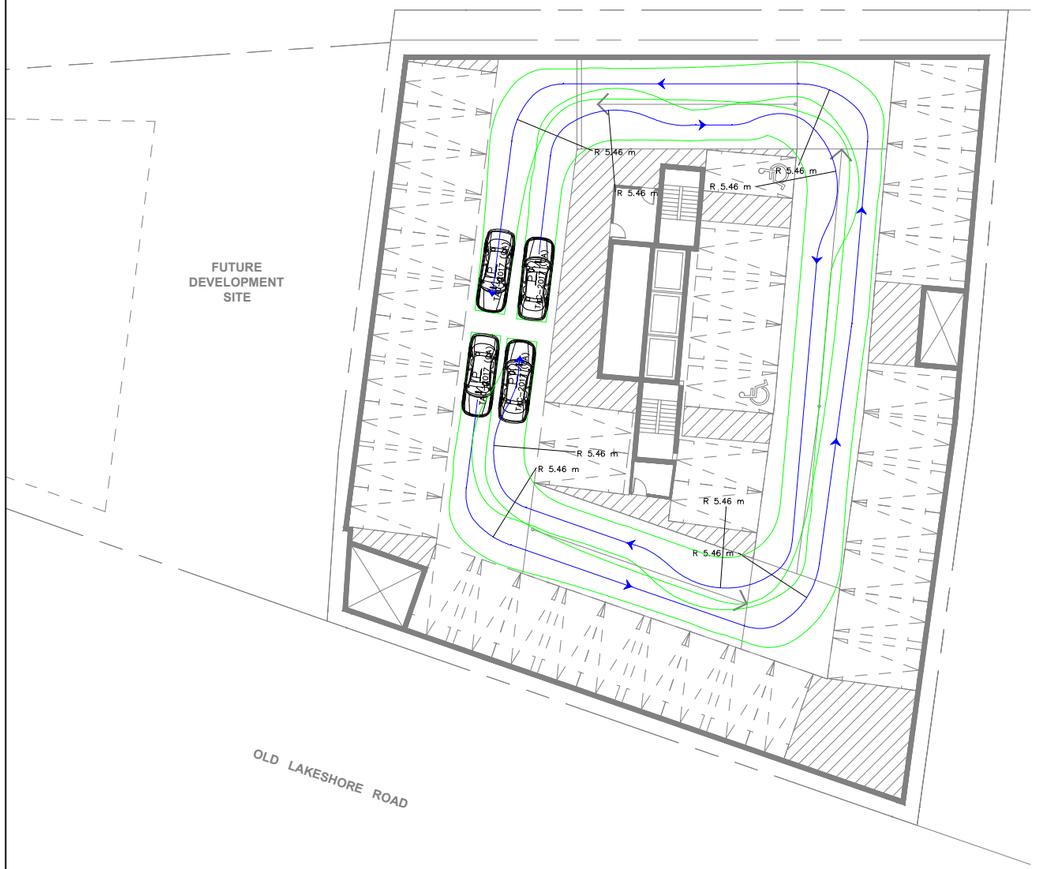
paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.: 05
DESIGN: LC	DRAWN: LC	CHECK: SC	

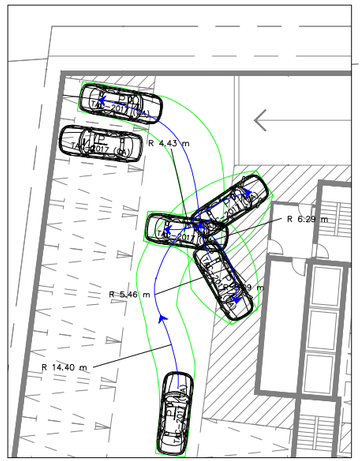
THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

P5

LAKESHORE ROAD

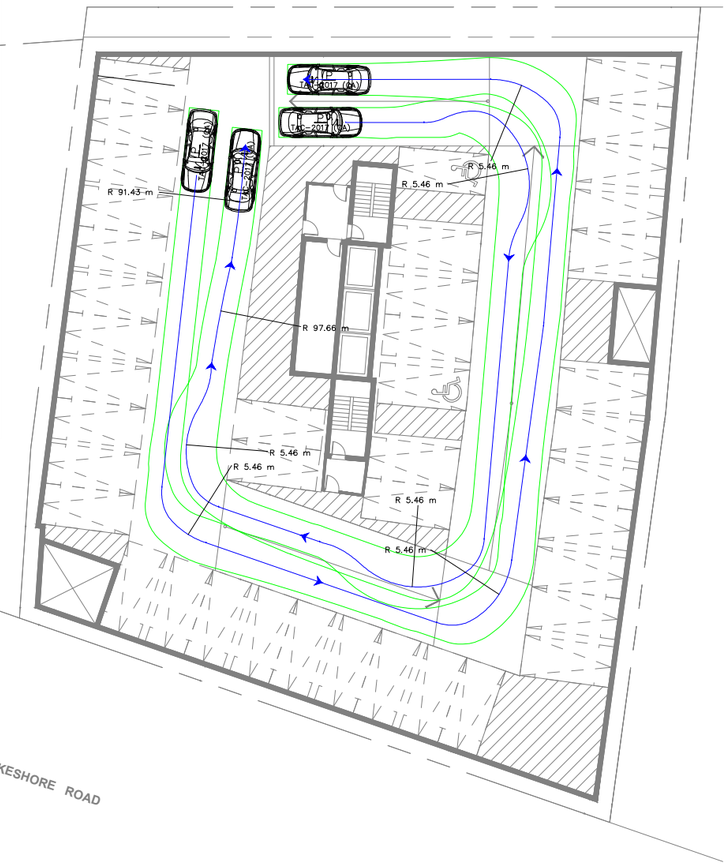


PARKING MANEUVER



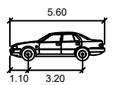
P4

LAKESHORE ROAD



NO.	DATE	INITIAL	REVISION DETAIL
02	2024-12-23	SC	UPDATED SITE PLAN
01	2024-12-16	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

AUTOTURN ASSESSMENT
2083 OLD LAKESHORE ROAD
CITY OF BURLINGTON

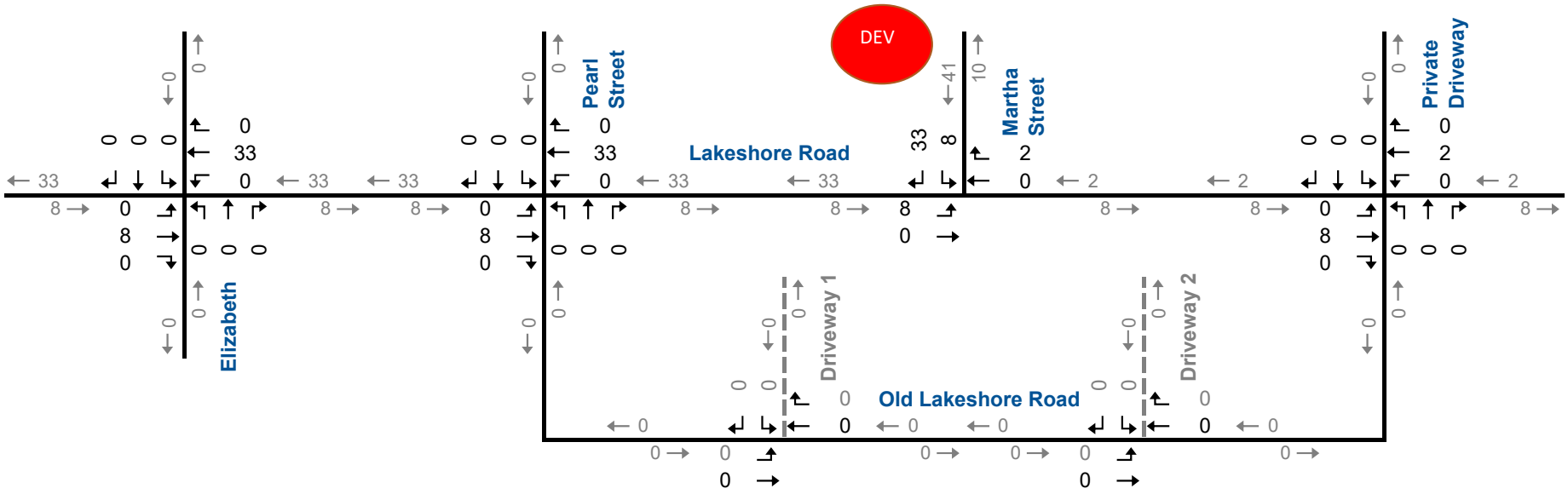
paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220617	DATE: NOV 2024	SCALE: 1:400	DRAWING NO.: 06
DESIGN: LC	DRAWN: LC	CHECK: SC	

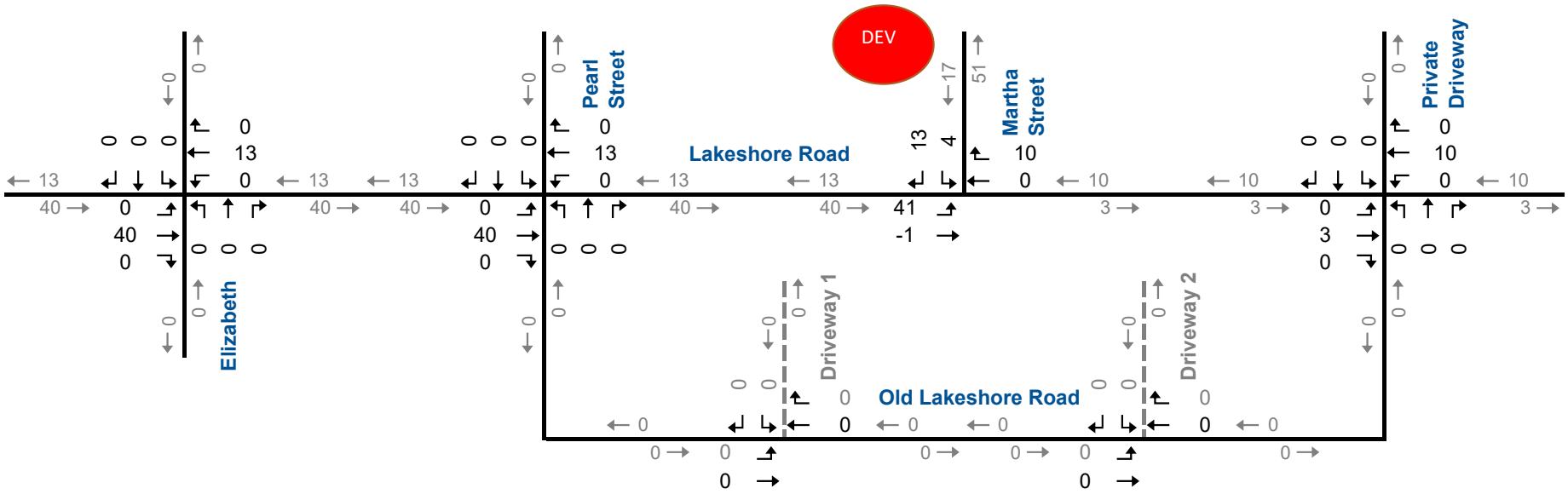
Appendix E

Background Development Traffic Projections

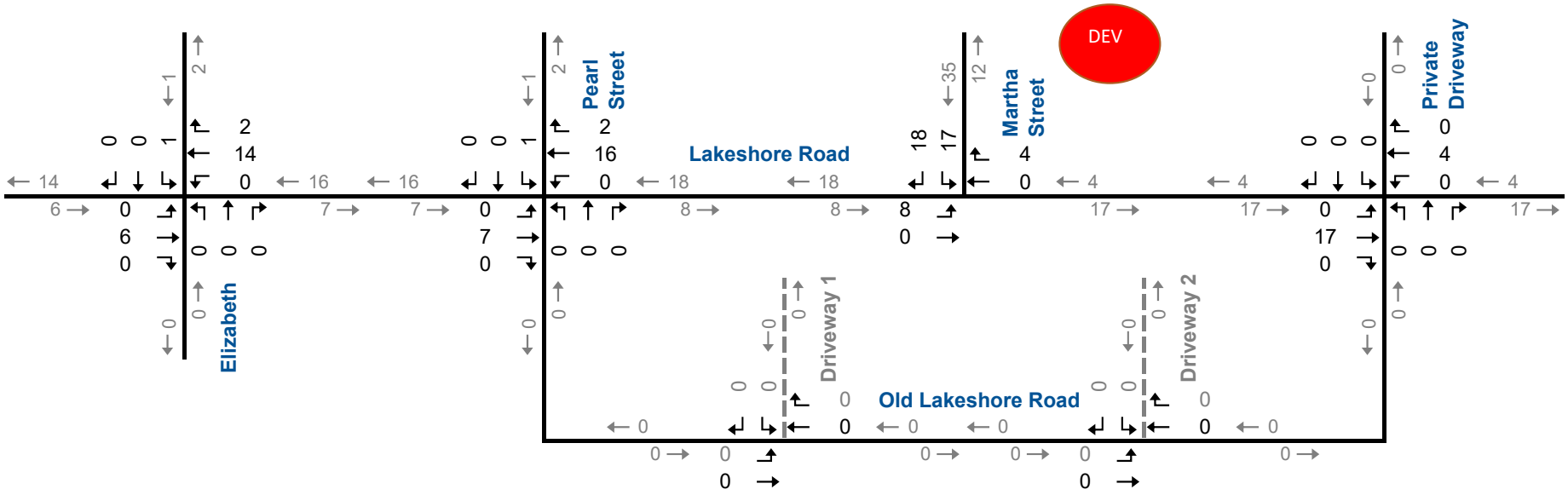
AM Peak Hour- 374 Marth Street



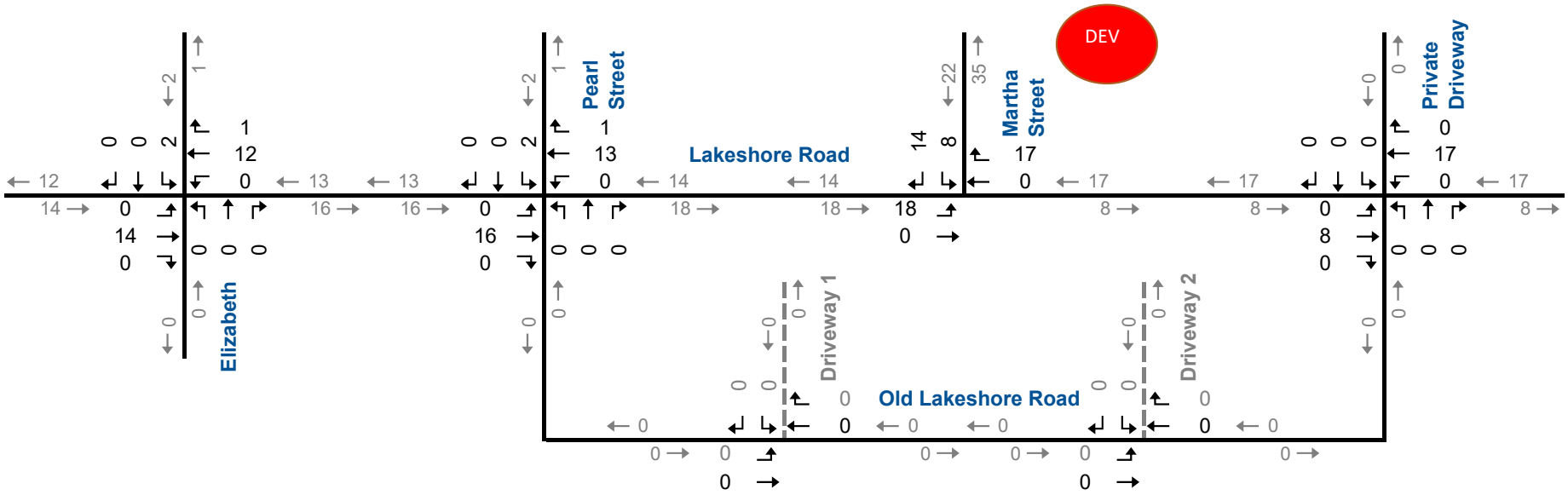
PM Peak Hour - 374 Marth Street



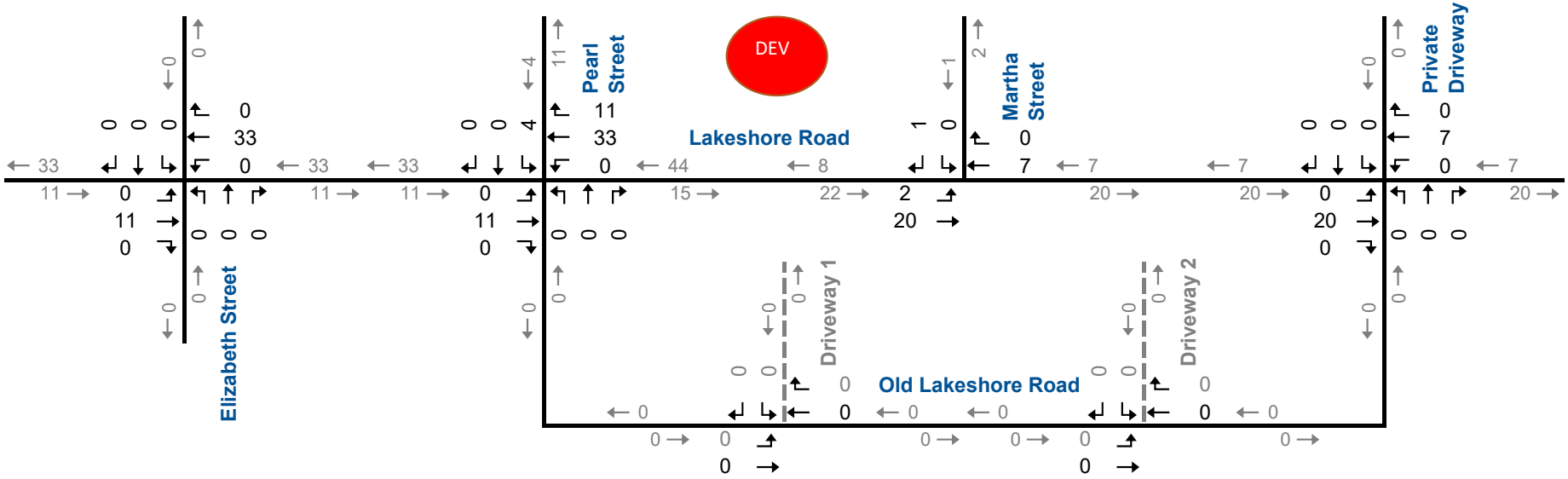
AM Peak Hour - 407 Martha Street



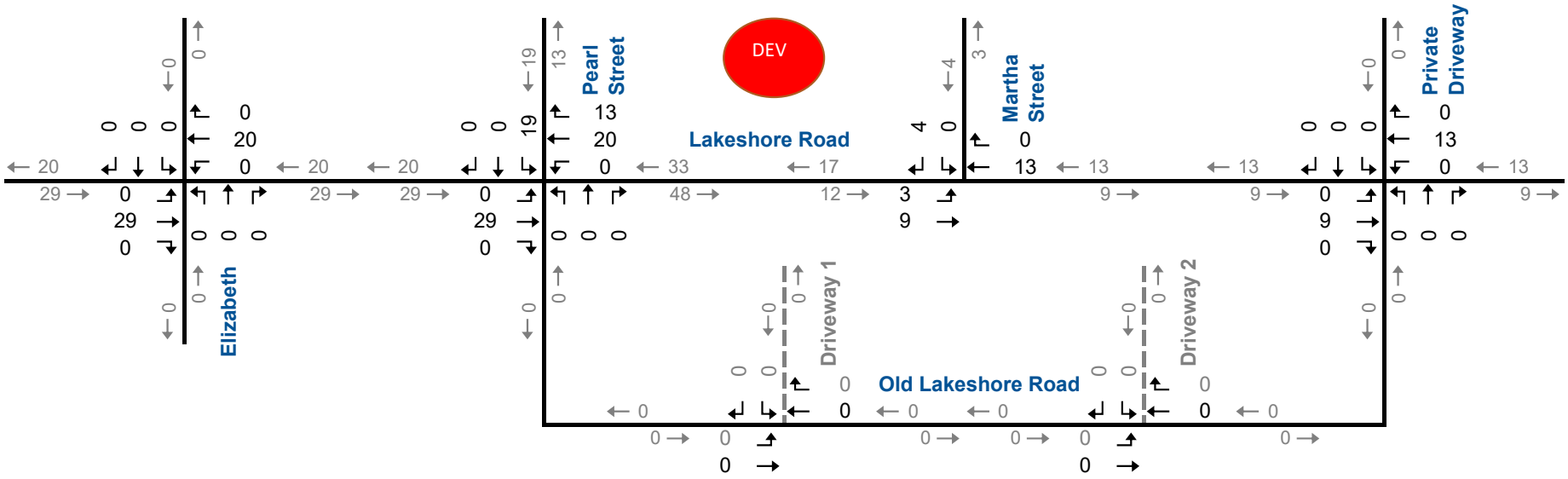
PM Peak Hour - 407 Martha Street



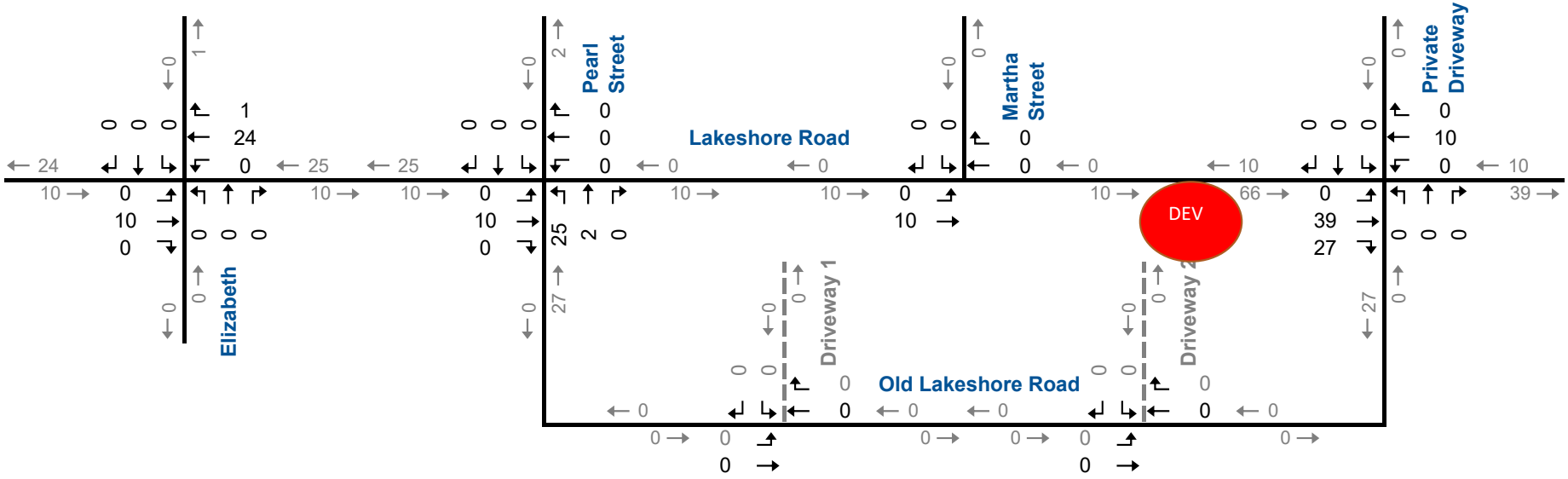
AM Peak Hour - 2069-2079 Lakeshore Road and 383-385 Pearl Street



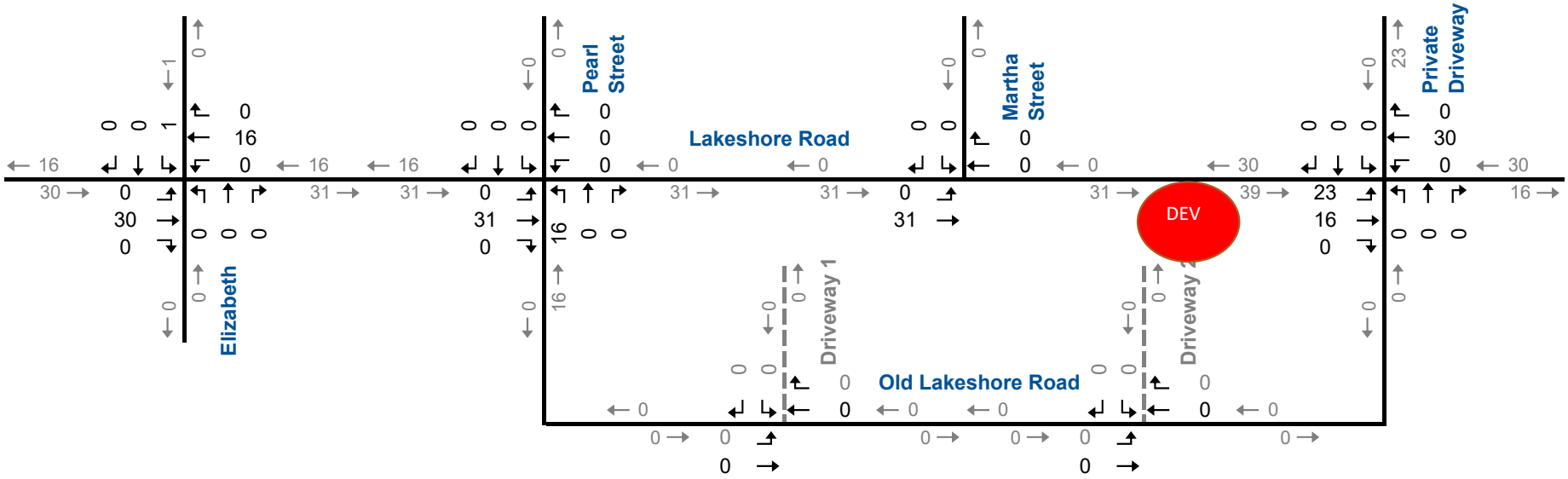
PM Peak Hour - 2069-2079 Lakeshore Road and 383-385 Pearl Street



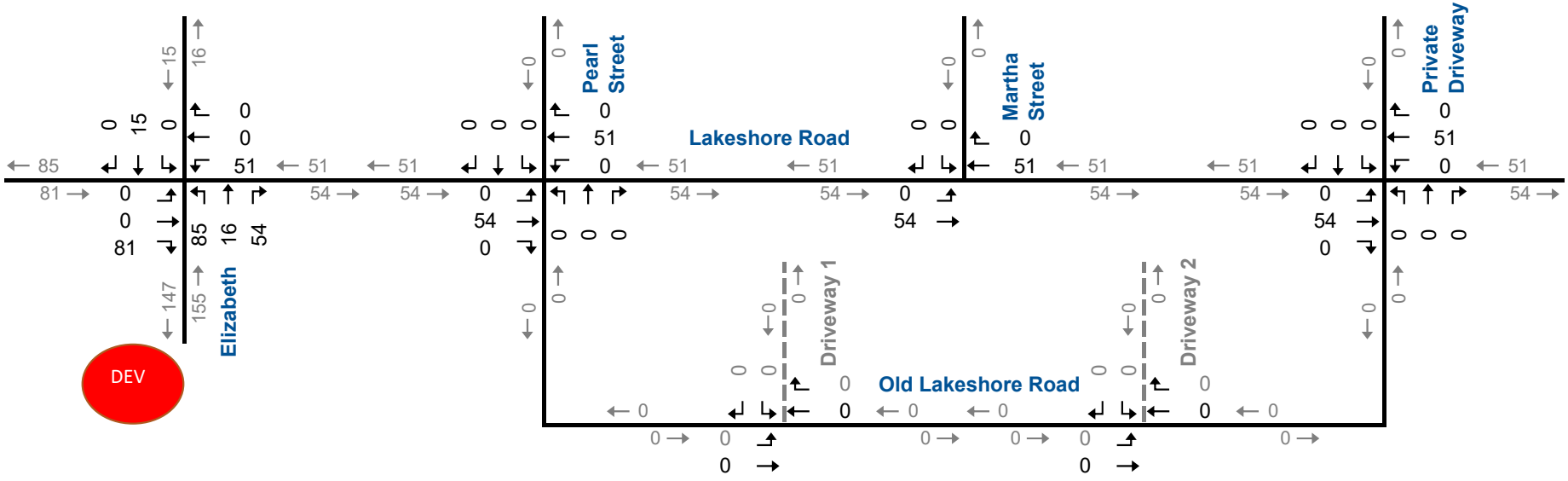
AM Peak Hour - 2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road



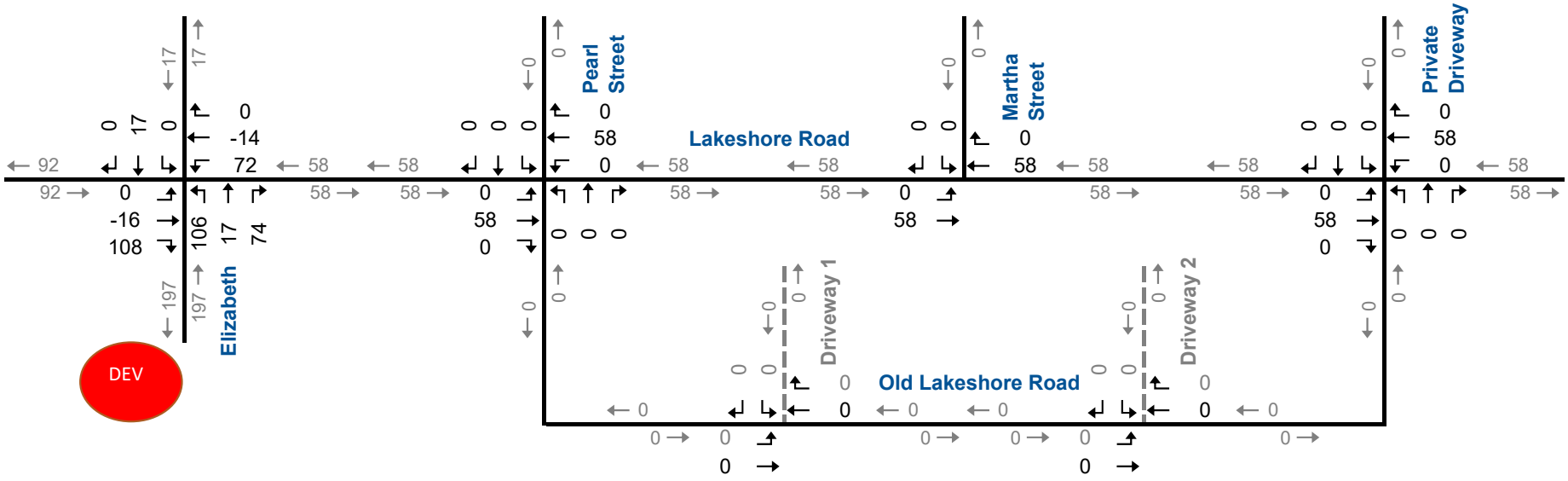
PM Peak Hour - 2093, 2097, 2101 Old Lakeshore Road, 2096, 2100 Lakeshore Road



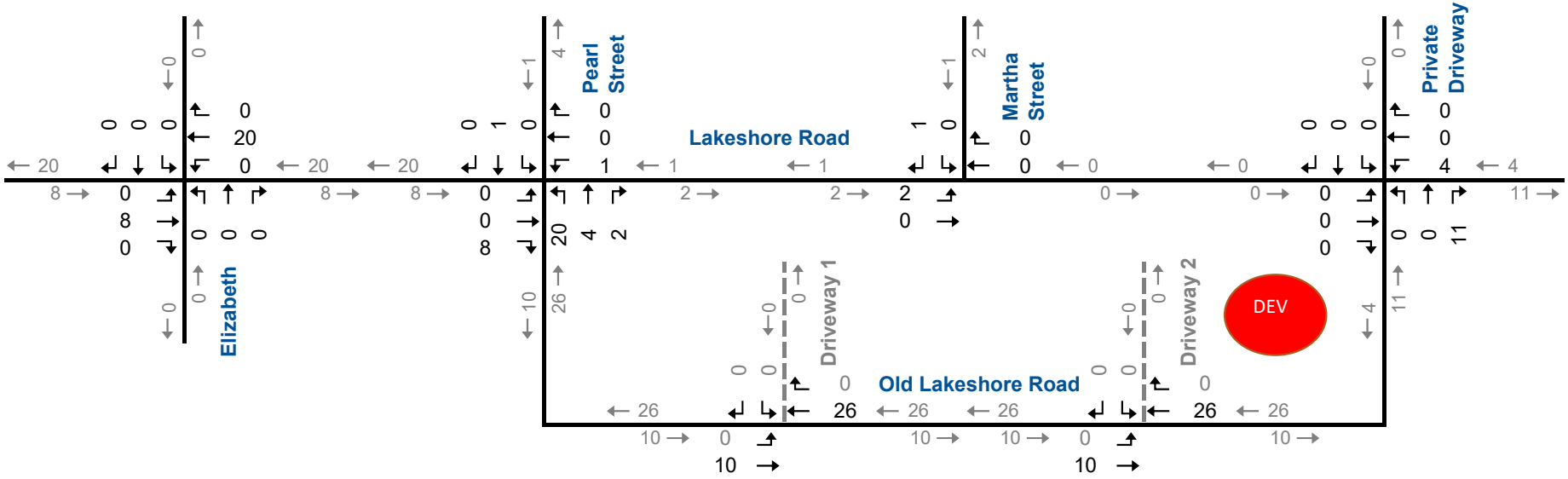
AM Peak Hour - 2020 Lakeshore Road



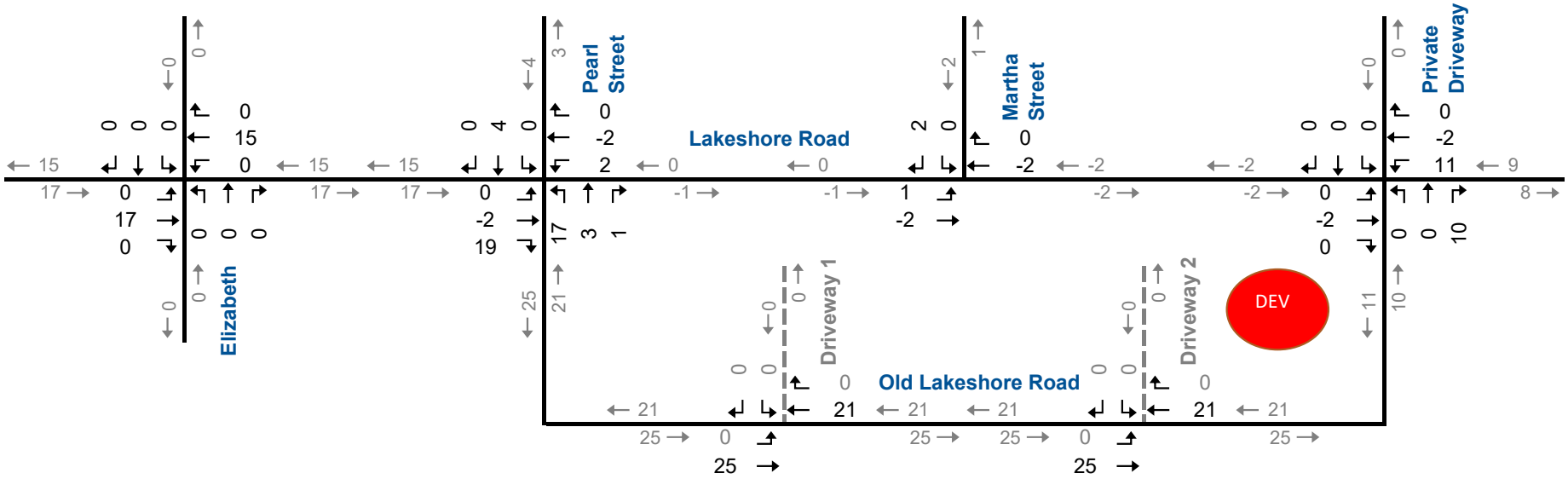
PM Peak Hour - 2020 Lakeshore Road



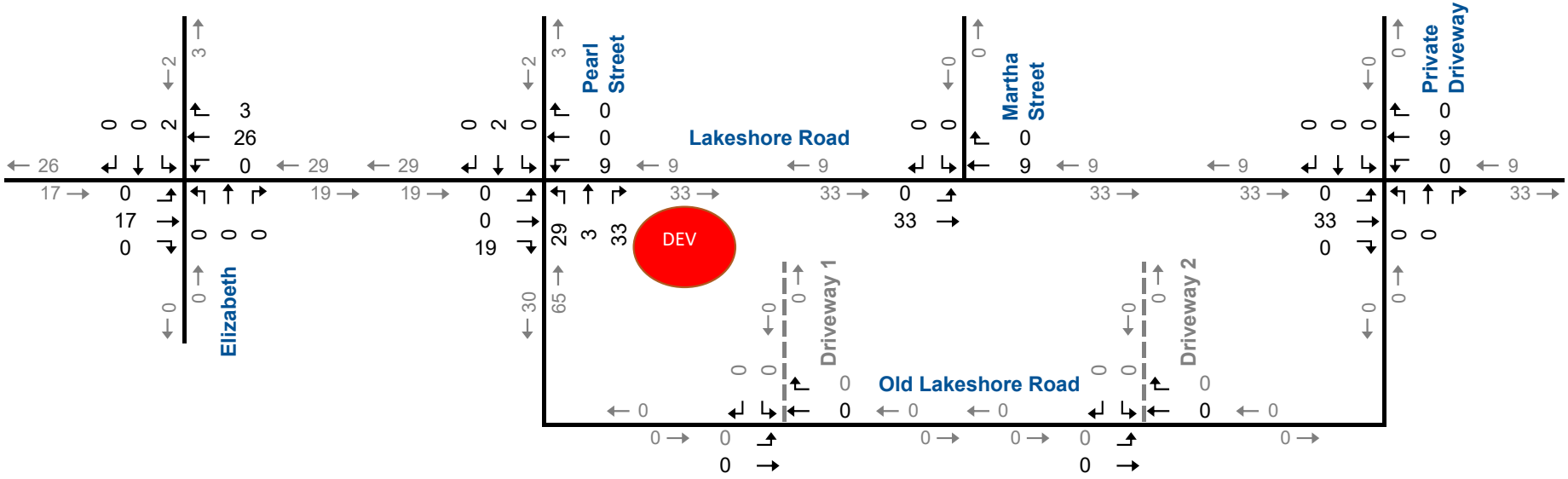
AM Peak Hour - 2107 Old Lakeshore Road and 2119 Lakeshore Road



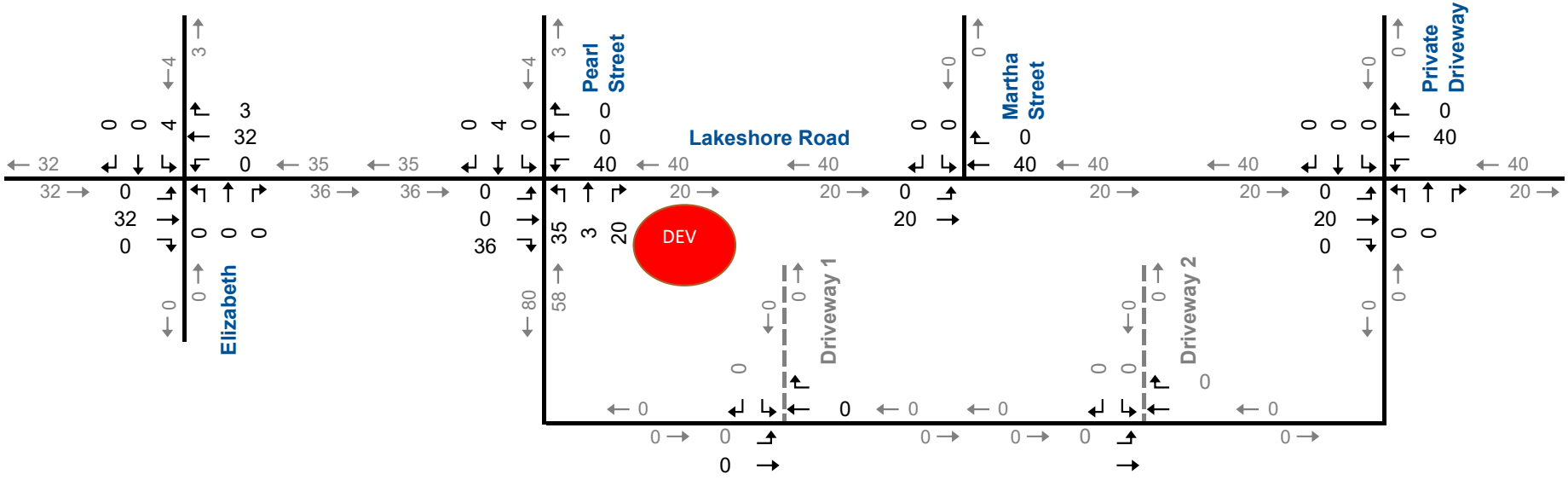
PM Peak Hour - 2107 Old Lakeshore Road and 2119 Lakeshore Road



AM Peak Hour - 2072 Lakeshore Road



PM Peak Hour - 2072 Lakeshore Road



Appendix F

Background Traffic Operations

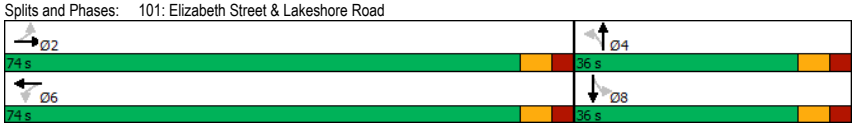


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	836	97	62	617	20	110	21	69	11	17	40
Future Volume (vph)	35	836	97	62	617	20	110	21	69	11	17	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99		1.00	0.99	
Frt		0.984			0.995			0.953			0.895	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1694	3476	0	1586	3439	0	0	1709	0	1264	1367	0
Flt Permitted	0.379			0.259				0.796		0.592		
Satd. Flow (perm)	673	3476	0	431	3439	0	0	1393	0	785	1367	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			6			24			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Adj. Flow (vph)	37	880	102	65	649	21	116	22	73	12	18	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	982	0	65	670	0	0	211	0	12	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Split (%)	67.3%	67.3%		67.3%	67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	67.0	67.0		67.0	67.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	70.3	70.3		70.3	70.3			21.7		21.7	21.7	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.22		0.22	0.22	
v/c Ratio	0.08	0.40		0.22	0.28			0.66		0.07	0.18	
Control Delay	6.7	7.3		8.9	6.5			41.4		30.7	14.9	
Queue Delay	0.0	0.0		0.0	0.4			0.0		0.0	0.0	
Total Delay	6.7	7.3		8.9	6.9			41.4		30.7	14.9	
LOS	A	A		A	A			D		C	B	
Approach Delay		7.3			7.1			41.4			17.5	
Approach LOS		A			A			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 100			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

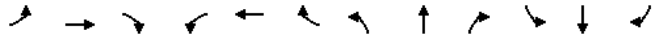
Splits and Phases: 101: Elizabeth Street & Lakeshore Road





Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	37	982	65	670	211	12	60
v/c Ratio	0.08	0.40	0.22	0.28	0.66	0.07	0.18
Control Delay	6.7	7.3	8.9	6.5	41.4	30.7	14.9
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	6.7	7.3	8.9	6.9	41.4	30.7	14.9
Queue Length 50th (m)	2.1	36.7	4.0	22.7	34.9	2.0	2.9
Queue Length 95th (m)	7.2	65.3	13.3	41.6	59.2	6.9	13.2
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	472	2448	302	2417	463	252	467
Starvation Cap Reductn	0	0	0	1186	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.40	0.22	0.54	0.46	0.05	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	836	97	62	617	20	110	21	69	11	17	40
Future Volume (vph)	35	836	97	62	617	20	110	21	69	11	17	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00			0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1688	3478		1580	3440			1704		1260	1367	
Flt Permitted	0.38	1.00		0.26	1.00			0.80		0.59	1.00	
Satd. Flow (perm)	673	3478		430	3440			1394		785	1367	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	880	102	65	649	21	116	22	73	12	18	42
RTOR Reduction (vph)	0	7	0	0	2	0	0	19	0	0	33	0
Lane Group Flow (vph)	37	975	0	65	668	0	0	192	0	12	27	0
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	67.2	67.2		67.2	67.2			18.7		18.7	18.7	
Effective Green, g (s)	70.2	70.2		70.2	70.2			21.7		21.7	21.7	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	472	2444		302	2417			302		170	296	
v/s Ratio Prot		c0.28			0.19						0.02	
v/s Ratio Perm	0.05			0.15				c0.14		0.02		
v/c Ratio	0.08	0.40		0.22	0.28			0.64		0.07	0.09	
Uniform Delay, d1	4.7	6.1		5.2	5.5			35.5		31.1	31.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		1.6	0.3			4.4		0.2	0.1	
Delay (s)	5.0	6.6		6.8	5.8			39.9		31.3	31.4	
Level of Service	A	A		A	A			D		C	C	
Approach Delay (s)		6.6			5.9			39.9			31.3	
Approach LOS		A			A			D			C	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	781	83	11	527	32	127	17	35	10	7	35
Future Volume (vph)	41	781	83	11	527	32	127	17	35	10	7	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00			0.99	
Frt		0.986			0.991			0.974			0.874	
Flt Protected	0.950			0.950				0.966		0.950		
Satd. Flow (prot)	1694	3443	0	1745	3399	0	0	1763	0	1454	1602	0
Flt Permitted	0.421			0.291				0.762		0.676		
Satd. Flow (perm)	747	3443	0	533	3399	0	0	1389	0	1035	1602	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		22			12			9				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	7		5	5		7	1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Adj. Flow (vph)	43	814	86	11	549	33	132	18	36	10	7	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	900	0	11	582	0	0	186	0	10	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	83.9	83.9		83.9	83.9			22.2		22.2	22.2	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.19		0.19	0.19	
v/c Ratio	0.08	0.35		0.03	0.23			0.67		0.05	0.14	
Control Delay	5.7	6.2		5.6	5.5			51.8		36.4	37.8	
Queue Delay	0.0	0.8		0.0	0.0			0.0		0.0	0.0	
Total Delay	5.7	7.0		5.6	5.5			51.8		36.4	37.8	
LOS	A	A		A	A			D		D	D	
Approach Delay		7.0			5.5			51.8			37.6	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 114.2			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

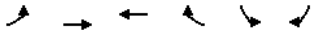


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	43	900	11	582	186	10	43
v/c Ratio	0.08	0.35	0.03	0.23	0.67	0.05	0.14
Control Delay	5.7	6.2	5.6	5.5	51.8	36.4	37.8
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	7.0	5.6	5.5	51.8	36.4	37.8
Queue Length 50th (m)	2.5	34.0	0.6	19.6	38.5	1.9	8.4
Queue Length 95th (m)	7.2	53.6	2.8	32.4	63.7	6.7	18.4
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	549	2536	391	2501	360	263	407
Starvation Cap Reductn	0	1239	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.69	0.03	0.23	0.52	0.04	0.11

Intersection Summary

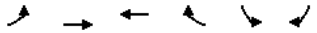
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	781	83	11	527	32	127	17	35	10	7	35
Future Volume (vph)	41	781	83	11	527	32	127	17	35	10	7	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.97		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1685	3442		1741	3401			1760		1454	1603	
Flt Permitted	0.42	1.00		0.29	1.00			0.76		0.68	1.00	
Satd. Flow (perm)	747	3442		533	3401			1389		1034	1603	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	43	814	86	11	549	33	132	18	36	10	7	36
RTOR Reduction (vph)	0	6	0	0	3	0	0	7	0	0	0	0
Lane Group Flow (vph)	43	894	0	11	579	0	0	179	0	10	43	0
Confl. Peds. (#/hr)	7		5	5		7	1					1
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	80.9	80.9		80.9	80.9			19.2		19.2	19.2	
Effective Green, g (s)	83.9	83.9		83.9	83.9			22.2		22.2	22.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.19		0.19	0.19	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	549	2530		391	2500			270		201	311	
v/s Ratio Prot		c0.26			0.17						0.03	
v/s Ratio Perm	0.06			0.02				c0.13		0.01		
v/c Ratio	0.08	0.35		0.03	0.23			0.66		0.05	0.14	
Uniform Delay, d1	4.2	5.4		4.1	4.8			42.5		37.4	38.0	
Progression Factor	1.00	1.00		1.00	1.00			0.98		1.00	1.00	
Incremental Delay, d2	0.3	0.4		0.1	0.2			6.0		0.1	0.2	
Delay (s)	4.5	5.8		4.2	5.0			47.8		37.5	38.2	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		5.7			5.0			47.8			38.1	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	41	901	513	14	28	58
Future Volume (vph)	41	901	513	14	28	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.909	
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1586	1845	1793	0	1534	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1586	1845	1793	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	8			8		10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	3%	5%	25%	33%	0%
Adj. Flow (vph)	46	1001	570	16	31	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	1001	586	0	95	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	901	513	14	28	58
Future Volume (Veh/h)	41	901	513	14	28	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	46	1001	570	16	31	64
Pedestrians		10			8	
Lane Width (m)		3.5			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.86	
vC, conflicting volume	594				1679	596
vC1, stage 1 conf vol					586	
vC2, stage 2 conf vol					1093	
vCu, unblocked vol	594				1708	596
tC, single (s)	4.2				6.7	6.2
tC, 2 stage (s)					5.7	
tF (s)	2.3				3.8	3.3
p0 queue free %	95				86	87
cM capacity (veh/h)	938				222	500

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	46	1001	586	95
Volume Left	46	0	0	31
Volume Right	0	0	16	64
cSH	938	1700	1700	355
Volume to Capacity	0.05	0.59	0.34	0.27
Queue Length 95th (m)	1.2	0.0	0.0	8.5
Control Delay (s)	9.0	0.0	0.0	18.8
Lane LOS	A			C
Approach Delay (s)	0.4		0.0	18.8
Approach LOS				C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

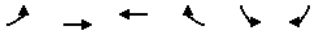
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	923	28	9	493	0	11	0	15	0	0	0
Future Volume (vph)	0	923	28	9	493	0	11	0	15	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996						0.923				
Flt Protected				0.950				0.979				
Satd. Flow (prot)	1900	1839	0	1745	1827	0	0	1717	0	0	1900	0
Flt Permitted				0.950				0.979				
Satd. Flow (perm)	1900	1839	0	1745	1827	0	0	1717	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	8					8			2	2		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	1014	31	10	542	0	12	0	16	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1045	0	10	542	0	0	28	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	923	28	9	493	0	11	0	15	0	0	0
Future Volume (Veh/h)	0	923	28	9	493	0	11	0	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	1014	31	10	542	0	12	0	16	0	0	0
Pedestrians					2						8	
Lane Width (m)					3.5						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						1	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	550			1045			1592	1600	1032	1602	1615	550
vC1, stage 1 conf vol							1030	1030		570	570	
vC2, stage 2 conf vol							562	570		1032	1045	
vCu, unblocked vol	550			947			1611	1621	931	1624	1640	550
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			95	100	94	100	100	100
cM capacity (veh/h)	1023			603			236	253	268	216	242	535

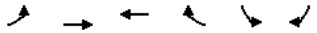
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	1045	10	542	28	0
Volume Left	0	0	10	0	12	0
Volume Right	0	31	0	0	16	0
cSH	1700	1700	603	1700	254	1700
Volume to Capacity	0.00	0.61	0.02	0.32	0.11	0.00
Queue Length 95th (m)	0.0	0.0	0.4	0.0	2.9	0.0
Control Delay (s)	0.0	0.0	11.1	0.0	21.0	0.0
Lane LOS			B		C	A
Approach Delay (s)	0.0		0.2		21.0	0.0
Approach LOS					C	A

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	60.9%	ICU Level of Service		B	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	72	88	0	0	0
Future Volume (vph)	0	72	88	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	78	96	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	78	96	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

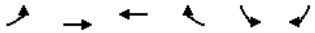
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	8.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	72	88	0	0	0
Future Volume (Veh/h)	0	72	88	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	78	96	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	96				174	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96				174	96
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1498				816	960

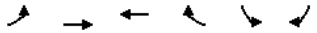
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	78	96	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1498	1700	1700
Volume to Capacity	0.00	0.06	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	72	88	0	0	0
Future Volume (vph)	0	72	88	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	78	96	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	78	96	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	8.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	72	88	0	0	0
Future Volume (Veh/h)	0	72	88	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	78	96	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	96				174	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96				174	96
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1498				816	960

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	78	96	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1498	1700	1700
Volume to Capacity	0.00	0.06	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

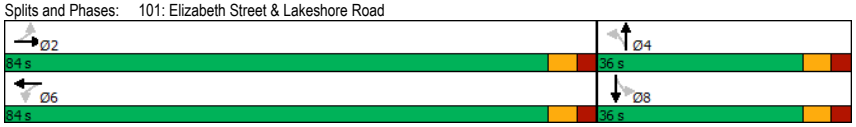
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	695	138	88	922	34	127	31	86	43	28	71
Future Volume (vph)	38	695	138	88	922	34	127	31	86	43	28	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00			0.99		0.99	0.98	
Frt		0.975			0.995			0.952			0.892	
Flt Protected	0.950			0.950				0.975		0.950		
Satd. Flow (prot)	1531	3443	0	1745	3546	0	0	1748	0	1601	1584	0
Flt Permitted	0.251			0.295				0.743		0.559		
Satd. Flow (perm)	401	3443	0	539	3546	0	0	1324	0	935	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			6			22			74	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Adj. Flow (vph)	40	724	144	92	960	35	132	32	90	45	29	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	868	0	92	995	0	0	254	0	45	103	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	84.0	84.0		84.0	84.0		36.0	36.0		36.0	36.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	77.0	77.0		77.0	77.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	80.2	80.2		80.2	80.2			26.6		26.6	26.6	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.23		0.23	0.23	
v/c Ratio	0.14	0.36		0.24	0.40			0.78		0.21	0.24	
Control Delay	8.5	7.6		9.4	8.3			55.1		37.4	13.9	
Queue Delay	0.0	0.0		0.0	1.2			0.0		0.0	0.0	
Total Delay	8.5	7.6		9.4	9.5			55.1		37.4	13.9	
LOS	A	A		A	A			E		D	B	
Approach Delay		7.6			9.5			55.1			21.1	
Approach LOS		A			A			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 114.8			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 101: Elizabeth Street & Lakeshore Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	868	92	995	254	45	103
v/c Ratio	0.14	0.36	0.24	0.40	0.78	0.21	0.24
Control Delay	8.5	7.6	9.4	8.3	55.1	37.4	13.9
Queue Delay	0.0	0.0	0.0	1.2	0.0	0.0	0.0
Total Delay	8.5	7.6	9.4	9.5	55.1	37.4	13.9
Queue Length 50th (m)	3.0	39.1	7.6	49.0	52.0	8.6	5.4
Queue Length 95th (m)	8.4	54.9	17.2	67.5	83.6	19.3	19.7
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	280	2416	376	2477	385	261	495
Starvation Cap Reductn	0	0	0	1171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.36	0.24	0.76	0.66	0.17	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	695	138	88	922	34	127	31	86	43	28	71
Future Volume (vph)	38	695	138	88	922	34	127	31	86	43	28	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			0.99		0.99	1.00	
Frt	1.00	0.98		1.00	0.99			0.95		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1519	3444		1735	3545			1738		1590	1585	
Flt Permitted	0.25	1.00		0.30	1.00			0.74		0.56	1.00	
Satd. Flow (perm)	402	3444		539	3545			1324		935	1585	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	40	724	144	92	960	35	132	32	90	45	29	74
RTOR Reduction (vph)	0	12	0	0	2	0	0	17	0	0	57	0
Lane Group Flow (vph)	40	856	0	92	993	0	0	237	0	45	46	0
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	77.2	77.2		77.2	77.2			23.6		23.6	23.6	
Effective Green, g (s)	80.2	80.2		80.2	80.2			26.6		26.6	26.6	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.23		0.23	0.23	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	280	2406		376	2476			306		216	367	
v/s Ratio Prot		0.25			c0.28						0.03	
v/s Ratio Perm	0.10			0.17				c0.18		0.05		
v/c Ratio	0.14	0.36		0.24	0.40			0.77		0.21	0.13	
Uniform Delay, d1	5.8	6.9		6.3	7.2			41.3		35.6	34.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.4		1.5	0.5			11.6		0.5	0.2	
Delay (s)	6.9	7.4		7.8	7.7			52.9		36.1	35.1	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		7.3			7.7			52.9			35.4	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	114.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	712	63	44	915	38	79	7	21	35	8	62
Future Volume (vph)	47	712	63	44	915	38	79	7	21	35	8	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Frt		0.988			0.994			0.973			0.866	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1745	3494	0	1745	3550	0	0	1776	0	1745	1597	0
Flt Permitted	0.265			0.329				0.735		0.711		
Satd. Flow (perm)	486	3494	0	603	3550	0	0	1353	0	1302	1597	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		18			8			10				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	49	749	66	46	963	40	83	7	22	37	8	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	815	0	46	1003	0	0	112	0	37	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	85.9	85.9		85.9	85.9			16.6		16.6	16.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.15		0.15	0.15	
v/c Ratio	0.13	0.30		0.10	0.36			0.53		0.19	0.31	
Control Delay	4.8	4.1		4.3	4.6			47.8		41.4	43.7	
Queue Delay	0.0	0.6		0.0	0.0			0.0		0.0	0.0	
Total Delay	4.8	4.7		4.3	4.6			47.8		41.4	43.7	
LOS	A	A		A	A			D		D	D	
Approach Delay		4.7			4.5			47.8			42.9	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 110.5			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 57.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

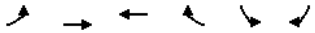


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	49	815	46	1003	112	37	73
v/c Ratio	0.13	0.30	0.10	0.36	0.53	0.19	0.31
Control Delay	4.8	4.1	4.3	4.6	47.8	41.4	43.7
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.7	4.3	4.6	47.8	41.4	43.7
Queue Length 50th (m)	2.2	22.1	2.0	29.6	20.8	7.2	14.5
Queue Length 95th (m)	7.2	38.1	6.5	50.0	39.1	17.0	28.3
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	377	2721	468	2762	362	341	419
Starvation Cap Reductn	0	1393	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.61	0.10	0.36	0.31	0.11	0.17

Intersection Summary

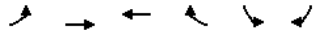
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	712	63	44	915	38	79	7	21	35	8	62
Future Volume (vph)	47	712	63	44	915	38	79	7	21	35	8	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99			0.97		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1741	3494		1740	3550			1776		1740	1598	
Flt Permitted	0.27	1.00		0.33	1.00			0.73		0.71	1.00	
Satd. Flow (perm)	486	3494		604	3550			1354		1302	1598	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	749	66	46	963	40	83	7	22	37	8	65
RTOR Reduction (vph)	0	4	0	0	2	0	0	8	0	0	0	0
Lane Group Flow (vph)	49	811	0	46	1001	0	0	104	0	37	73	0
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	83.0	83.0		83.0	83.0			13.6		13.6	13.6	
Effective Green, g (s)	86.0	86.0		86.0	86.0			16.6		16.6	16.6	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.15		0.15	0.15	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	377	2716		469	2760			203		195	239	
v/s Ratio Prot		0.23			c0.28						0.05	
v/s Ratio Perm	0.10			0.08				c0.08		0.03		
v/c Ratio	0.13	0.30		0.10	0.36			0.51		0.19	0.31	
Uniform Delay, d1	3.0	3.6		3.0	3.8			43.3		41.1	41.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3		0.4	0.4			2.0		0.5	0.7	
Delay (s)	3.8	3.8		3.4	4.2			45.4		41.6	42.6	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		3.8			4.1			45.4			42.3	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	636	978	50	16	38
Future Volume (vph)	97	636	978	50	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.905	
Flt Protected	0.950				0.985	
Satd. Flow (prot)	1694	1863	1869	0	1694	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1694	1863	1869	0	1694	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	6			6		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	2%	1%	0%	0%	0%
Adj. Flow (vph)	101	663	1019	52	17	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	663	1071	0	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	97	636	978	50	16	38
Future Volume (Veh/h)	97	636	978	50	16	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	101	662	1019	52	17	40
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.90	
vC, conflicting volume	1077				1915	1051
vC1, stage 1 conf vol					1051	
vC2, stage 2 conf vol					864	
vCu, unblocked vol	1077				1959	1051
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				93	86
cM capacity (veh/h)	640				238	277

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	101	662	1071	57
Volume Left	101	0	0	17
Volume Right	0	0	52	40
cSH	640	1700	1700	264
Volume to Capacity	0.16	0.39	0.63	0.22
Queue Length 95th (m)	4.5	0.0	0.0	6.4
Control Delay (s)	11.7	0.0	0.0	22.4
Lane LOS	B			C
Approach Delay (s)	1.5		0.0	22.4
Approach LOS				C

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		73.2%	ICU Level of Service	D
Analysis Period (min)		15		

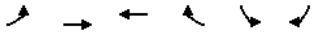
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	640	2	18	1038	0	4	0	28	0	0	0
Future Volume (vph)	23	640	2	18	1038	0	4	0	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.881				
Flt Protected	0.950			0.950				0.994				
Satd. Flow (prot)	1805	1863	0	1745	1845	0	0	1664	0	0	1900	0
Flt Permitted	0.950			0.950				0.994				
Satd. Flow (perm)	1805	1863	0	1745	1845	0	0	1664	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	5		1	1		5						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	681	2	19	1104	0	4	0	30	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	683	0	19	1104	0	0	34	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	640	2	18	1038	0	4	0	28	0	0	0
Future Volume (Veh/h)	23	640	2	18	1038	0	4	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	24	681	2	19	1104	0	4	0	30	0	0	0
Pedestrians								1			5	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	1109			684			1873	1878	683	1906	1879	1109
vC1, stage 1 conf vol							731	731		1147	1147	
vC2, stage 2 conf vol							1142	1147		759	732	
vCu, unblocked vol	1109			593			1915	1920	592	1951	1921	1109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			98	100	93	100	100	100
cM capacity (veh/h)	634			893			189	210	458	192	221	256

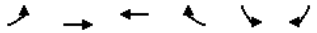
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	24	683	19	1104	34	0
Volume Left	24	0	19	0	4	0
Volume Right	0	2	0	0	30	0
cSH	634	1700	893	1700	392	1700
Volume to Capacity	0.04	0.40	0.02	0.65	0.09	0.00
Queue Length 95th (m)	0.9	0.0	0.5	0.0	2.3	0.0
Control Delay (s)	10.9	0.0	9.1	0.0	15.0	0.0
Lane LOS	B		A		C	A
Approach Delay (s)	0.4		0.2		15.0	0.0
Approach LOS					C	A

Intersection Summary					
Average Delay		0.5			
Intersection Capacity Utilization		64.6%	ICU Level of Service		C
Analysis Period (min)		15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	0	0	0
Future Volume (vph)	0	36	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	39	36	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	39	36	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

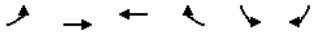
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	36	33	0	0	0
Future Volume (Veh/h)	0	36	33	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	39	36	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	36				75	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36				75	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1575				928	1037

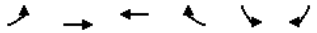
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	36	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1575	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	36	33	0	0	0
Future Volume (vph)	0	36	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	39	36	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	39	36	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	36	33	0	0	0
Future Volume (Veh/h)	0	36	33	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	39	36	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	36				75	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36				75	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1575				928	1037

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	36	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1575	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

Total Traffic Operations

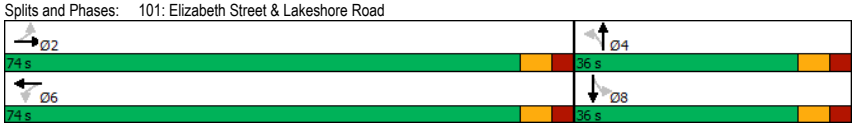


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	852	97	62	638	23	110	21	69	12	17	40
Future Volume (vph)	35	852	97	62	638	23	110	21	69	12	17	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99		1.00	0.99	
Frt		0.985			0.995			0.953			0.895	
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1694	3479	0	1586	3438	0	0	1709	0	1264	1367	0
Flt Permitted	0.367			0.253				0.796		0.592		
Satd. Flow (perm)	652	3479	0	421	3438	0	0	1393	0	785	1367	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			6			24			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Adj. Flow (vph)	37	897	102	65	672	24	116	22	73	13	18	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	999	0	65	696	0	0	211	0	13	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	74.0	74.0		74.0	74.0		36.0	36.0		36.0	36.0	
Total Split (%)	67.3%	67.3%		67.3%	67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	67.0	67.0		67.0	67.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	70.3	70.3		70.3	70.3			21.7		21.7	21.7	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.22		0.22	0.22	
v/c Ratio	0.08	0.41		0.22	0.29			0.66		0.08	0.18	
Control Delay	6.7	7.3		9.1	6.5			41.4		30.8	14.9	
Queue Delay	0.0	0.0		0.0	0.5			0.0		0.0	0.0	
Total Delay	6.7	7.3		9.1	7.0			41.4		30.8	14.9	
LOS	A	A		A	A			D		C	B	
Approach Delay		7.3			7.2			41.4			17.7	
Approach LOS		A			A			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 100			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 101: Elizabeth Street & Lakeshore Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	37	999	65	696	211	13	60
v/c Ratio	0.08	0.41	0.22	0.29	0.66	0.08	0.18
Control Delay	6.7	7.3	9.1	6.5	41.4	30.8	14.9
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	6.7	7.3	9.1	7.0	41.4	30.8	14.9
Queue Length 50th (m)	2.1	37.6	4.1	23.8	34.9	2.1	2.9
Queue Length 95th (m)	7.2	66.8	13.4	43.6	59.2	7.1	13.2
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	458	2450	295	2417	463	252	467
Starvation Cap Reductn	0	0	0	1173	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.41	0.22	0.56	0.46	0.05	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	852	97	62	638	23	110	21	69	12	17	40
Future Volume (vph)	35	852	97	62	638	23	110	21	69	12	17	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99			0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1689	3479		1580	3437			1704		1260	1367	
Flt Permitted	0.37	1.00		0.25	1.00			0.80		0.59	1.00	
Satd. Flow (perm)	653	3479		421	3437			1394		785	1367	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	897	102	65	672	24	116	22	73	13	18	42
RTOR Reduction (vph)	0	7	0	0	2	0	0	19	0	0	33	0
Lane Group Flow (vph)	37	992	0	65	694	0	0	192	0	13	27	0
Confl. Peds. (#/hr)	6		12	12		6	7		6	6		7
Heavy Vehicles (%)	3%	2%	0%	10%	4%	15%	0%	0%	7%	38%	50%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	67.2	67.2		67.2	67.2			18.7		18.7	18.7	
Effective Green, g (s)	70.2	70.2		70.2	70.2			21.7		21.7	21.7	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	458	2444		295	2415			302		170	296	
v/s Ratio Prot		c0.29			0.20						0.02	
v/s Ratio Perm	0.06			0.15				c0.14		0.02		
v/c Ratio	0.08	0.41		0.22	0.29			0.64		0.08	0.09	
Uniform Delay, d1	4.7	6.2		5.2	5.5			35.5		31.1	31.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		1.7	0.3			4.4		0.2	0.1	
Delay (s)	5.0	6.7		6.9	5.8			39.9		31.3	31.4	
Level of Service	A	A		A	A			D		C	C	
Approach Delay (s)		6.6			5.9			39.9			31.4	
Approach LOS		A			A			D			C	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	781	100	11	527	32	151	20	35	10	8	35
Future Volume (vph)	41	781	100	11	527	32	151	20	35	10	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00			0.99	
Frt		0.983			0.991			0.977			0.877	
Flt Protected	0.950			0.950				0.965		0.950		
Satd. Flow (prot)	1694	3430	0	1745	3399	0	0	1765	0	1454	1609	0
Flt Permitted	0.419			0.282				0.755		0.682		
Satd. Flow (perm)	743	3430	0	517	3399	0	0	1380	0	1044	1609	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		27			12			8				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	7		5	5		7	1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Adj. Flow (vph)	43	814	104	11	549	33	157	21	36	10	8	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	918	0	11	582	0	0	214	0	10	44	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	83.2	83.2		83.2	83.2			24.1		24.1	24.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72			0.21		0.21	0.21	
v/c Ratio	0.08	0.37		0.03	0.24			0.73		0.05	0.13	
Control Delay	6.1	6.8		6.0	6.0			55.0		35.9	37.2	
Queue Delay	0.0	0.9		0.0	0.0			0.0		0.0	0.0	
Total Delay	6.1	7.8		6.0	6.0			55.0		35.9	37.2	
LOS	A	A		A	A			D		D	D	
Approach Delay		7.7			6.0			55.0			37.0	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 115.3			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

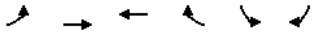


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	43	918	11	582	214	10	44
v/c Ratio	0.08	0.37	0.03	0.24	0.73	0.05	0.13
Control Delay	6.1	6.8	6.0	6.0	55.0	35.9	37.2
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	7.8	6.0	6.0	55.0	35.9	37.2
Queue Length 50th (m)	2.8	38.9	0.7	22.0	46.0	1.9	8.5
Queue Length 95th (m)	7.2	54.8	2.8	32.4	73.7	6.7	18.9
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	535	2481	372	2454	353	263	405
Starvation Cap Reductn	0	1199	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.72	0.03	0.24	0.61	0.04	0.11

Intersection Summary

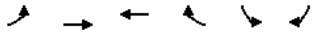
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	781	100	11	527	32	151	20	35	10	8	35
Future Volume (vph)	41	781	100	11	527	32	151	20	35	10	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99			0.98		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1685	3430		1741	3401			1764		1454	1609	
Flt Permitted	0.42	1.00		0.28	1.00			0.76		0.68	1.00	
Satd. Flow (perm)	744	3430		516	3401			1381		1044	1609	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	43	814	104	11	549	33	157	21	36	10	8	36
RTOR Reduction (vph)	0	8	0	0	3	0	0	6	0	0	0	0
Lane Group Flow (vph)	43	910	0	11	579	0	0	208	0	10	44	0
Confl. Peds. (#/hr)	7		5	5		7	1					1
Heavy Vehicles (%)	3%	3%	4%	0%	5%	6%	2%	0%	0%	20%	0%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	80.1	80.1		80.1	80.1			21.1		21.1	21.1	
Effective Green, g (s)	83.1	83.1		83.1	83.1			24.1		24.1	24.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72			0.21		0.21	0.21	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	536	2474		372	2453			288		218	336	
v/s Ratio Prot		c0.27			0.17						0.03	
v/s Ratio Perm	0.06			0.02				c0.15		0.01		
v/c Ratio	0.08	0.37		0.03	0.24			0.72		0.05	0.13	
Uniform Delay, d1	4.7	6.1		4.6	5.4			42.4		36.4	37.0	
Progression Factor	1.00	1.00		1.00	1.00			0.99		1.00	1.00	
Incremental Delay, d2	0.3	0.4		0.1	0.2			8.6		0.1	0.2	
Delay (s)	5.0	6.5		4.7	5.6			50.4		36.5	37.2	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		6.4			5.6			50.4			37.1	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	41	901	513	14	28	58
Future Volume (vph)	41	901	513	14	28	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.909	
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1586	1845	1793	0	1534	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1586	1845	1793	0	1534	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	8			8		10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	3%	5%	25%	33%	0%
Adj. Flow (vph)	46	1001	570	16	31	64
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	1001	586	0	95	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	901	513	14	28	58
Future Volume (Veh/h)	41	901	513	14	28	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	46	1001	570	16	31	64
Pedestrians		10			8	
Lane Width (m)		3.5			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.85	
vC, conflicting volume	594				1679	596
vC1, stage 1 conf vol					586	
vC2, stage 2 conf vol					1093	
vCu, unblocked vol	594				1710	596
tC, single (s)	4.2				6.7	6.2
tC, 2 stage (s)					5.7	
tF (s)	2.3				3.8	3.3
p0 queue free %	95				86	87
cM capacity (veh/h)	938				222	500

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	46	1001	586	95
Volume Left	46	0	0	31
Volume Right	0	0	16	64
cSH	938	1700	1700	355
Volume to Capacity	0.05	0.59	0.34	0.27
Queue Length 95th (m)	1.2	0.0	0.0	8.5
Control Delay (s)	9.0	0.0	0.0	18.8
Lane LOS	A			C
Approach Delay (s)	0.4		0.0	18.8
Approach LOS				C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

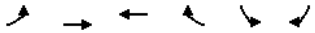
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	923	28	17	493	0	11	0	41	0	0	0
Future Volume (vph)	0	923	28	17	493	0	11	0	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996						0.893				
Flt Protected				0.950				0.990				
Satd. Flow (prot)	1900	1839	0	1745	1827	0	0	1680	0	0	1900	0
Flt Permitted				0.950				0.990				
Satd. Flow (perm)	1900	1839	0	1745	1827	0	0	1680	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	8					8			2	2		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	1014	31	19	542	0	12	0	45	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1045	0	19	542	0	0	57	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	923	28	17	493	0	11	0	41	0	0	0
Future Volume (Veh/h)	0	923	28	17	493	0	11	0	41	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	1014	31	19	542	0	12	0	45	0	0	0
Pedestrians					2						8	
Lane Width (m)					3.5						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						1	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	550			1045			1610	1618	1032	1649	1633	550
vC1, stage 1 conf vol							1030	1030		588	588	
vC2, stage 2 conf vol							580	588		1061	1045	
vCu, unblocked vol	550			942			1634	1644	926	1683	1663	550
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			95	100	83	100	100	100
cM capacity (veh/h)	1023			600			234	249	268	176	233	535

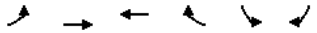
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	0	1045	19	542	57	0
Volume Left	0	0	19	0	12	0
Volume Right	0	31	0	0	45	0
cSH	1700	1700	600	1700	260	1700
Volume to Capacity	0.00	0.61	0.03	0.32	0.22	0.00
Queue Length 95th (m)	0.0	0.0	0.8	0.0	6.5	0.0
Control Delay (s)	0.0	0.0	11.2	0.0	22.7	0.0
Lane LOS			B		C	A
Approach Delay (s)	0.0		0.4		22.7	0.0
Approach LOS					C	A

Intersection Summary					
Average Delay	0.9				
Intersection Capacity Utilization	60.9%	ICU Level of Service		B	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	74	90	7	23	25
Future Volume (vph)	16	74	90	7	23	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.990		0.930	
Flt Protected		0.991			0.977	
Satd. Flow (prot)	0	1846	1844	0	1693	0
Flt Permitted		0.991			0.977	
Satd. Flow (perm)	0	1846	1844	0	1693	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	80	98	8	25	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	97	106	0	52	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

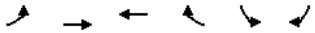
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	74	90	7	23	25
Future Volume (Veh/h)	16	74	90	7	23	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	80	98	8	25	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	106				216	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106				216	102
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	97
cM capacity (veh/h)	1485				763	953

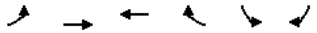
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	97	106	52
Volume Left	17	0	25
Volume Right	0	8	27
cSH	1485	1700	851
Volume to Capacity	0.01	0.06	0.06
Queue Length 95th (m)	0.3	0.0	1.6
Control Delay (s)	1.4	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	1.4	0.0	9.5
Approach LOS			A

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		21.4%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	95	95	1	3	2
Future Volume (vph)	2	95	95	1	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.946	
Flt Protected		0.999			0.971	
Satd. Flow (prot)	0	1861	1861	0	1711	0
Flt Permitted		0.999			0.971	
Satd. Flow (perm)	0	1861	1861	0	1711	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	103	103	1	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	105	104	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	95	95	1	3	2
Future Volume (Veh/h)	2	95	95	1	3	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	103	103	1	3	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	104				210	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	104				210	104
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1488				777	951

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	105	104	5
Volume Left	2	0	3
Volume Right	0	1	2
cSH	1488	1700	838
Volume to Capacity	0.00	0.06	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.2	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.3
Approach LOS			A

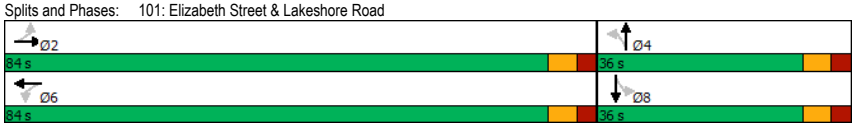
Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		16.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	722	138	88	950	36	127	31	86	46	28	71
Future Volume (vph)	38	722	138	88	950	36	127	31	86	46	28	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		10.0	25.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00			0.99		0.99	0.98	
Frt		0.976			0.994			0.952			0.892	
Flt Protected	0.950			0.950				0.975		0.950		
Satd. Flow (prot)	1531	3448	0	1745	3542	0	0	1748	0	1601	1584	0
Flt Permitted	0.241			0.285				0.743		0.559		
Satd. Flow (perm)	385	3448	0	521	3542	0	0	1324	0	935	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			7			22			74	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		87.0			121.1			67.5			85.4	
Travel Time (s)		6.3			8.7			4.9			6.1	
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Adj. Flow (vph)	40	752	144	92	990	38	132	32	90	48	29	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	896	0	92	1028	0	0	254	0	48	103	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		36.0	36.0		36.0	36.0	
Total Split (s)	84.0	84.0		84.0	84.0		36.0	36.0		36.0	36.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	77.0	77.0		77.0	77.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	80.2	80.2		80.2	80.2			26.6		26.6	26.6	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.23		0.23	0.23	
v/c Ratio	0.15	0.37		0.25	0.42			0.78		0.22	0.24	
Control Delay	8.7	7.7		9.6	8.5			55.1		37.8	13.9	
Queue Delay	0.0	0.0		0.0	1.3			0.0		0.0	0.0	
Total Delay	8.7	7.7		9.6	9.7			55.1		37.8	13.9	
LOS	A	A		A	A			E		D	B	
Approach Delay		7.8			9.7			55.1			21.5	
Approach LOS		A			A			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 114.8			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 101: Elizabeth Street & Lakeshore Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	896	92	1028	254	48	103
v/c Ratio	0.15	0.37	0.25	0.42	0.78	0.22	0.24
Control Delay	8.7	7.7	9.6	8.5	55.1	37.8	13.9
Queue Delay	0.0	0.0	0.0	1.3	0.0	0.0	0.0
Total Delay	8.7	7.7	9.6	9.7	55.1	37.8	13.9
Queue Length 50th (m)	3.0	40.8	7.6	51.3	52.0	9.2	5.4
Queue Length 95th (m)	8.5	57.3	17.5	70.3	83.6	20.2	19.7
Internal Link Dist (m)		63.0		97.1	43.5		61.4
Turn Bay Length (m)	40.0		25.0			15.0	
Base Capacity (vph)	268	2419	363	2475	385	261	495
Starvation Cap Reductn	0	0	0	1153	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.37	0.25	0.78	0.66	0.18	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	722	138	88	950	36	127	31	86	46	28	71
Future Volume (vph)	38	722	138	88	950	36	127	31	86	46	28	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			0.99		0.99	1.00	
Frt	1.00	0.98		1.00	0.99			0.95		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1520	3448		1735	3543			1738		1590	1585	
Flt Permitted	0.24	1.00		0.28	1.00			0.74		0.56	1.00	
Satd. Flow (perm)	385	3448		520	3543			1324		935	1585	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	40	752	144	92	990	38	132	32	90	48	29	74
RTOR Reduction (vph)	0	12	0	0	2	0	0	17	0	0	57	0
Lane Group Flow (vph)	40	884	0	92	1026	0	0	237	0	48	46	0
Confl. Peds. (#/hr)	21		13	13		21	11		11	11		11
Heavy Vehicles (%)	14%	1%	4%	0%	1%	4%	0%	0%	0%	9%	0%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	77.2	77.2		77.2	77.2			23.6		23.6	23.6	
Effective Green, g (s)	80.2	80.2		80.2	80.2			26.6		26.6	26.6	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.23		0.23	0.23	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	268	2408		363	2475			306		216	367	
v/s Ratio Prot		0.26			c0.29						0.03	
v/s Ratio Perm	0.10			0.18				c0.18		0.05		
v/c Ratio	0.15	0.37		0.25	0.41			0.77		0.22	0.13	
Uniform Delay, d1	5.8	7.0		6.3	7.3			41.3		35.7	34.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.4		1.7	0.5			11.6		0.5	0.2	
Delay (s)	7.0	7.4		8.0	7.9			52.9		36.2	35.1	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		7.4			7.9			52.9			35.4	
Approach LOS		A			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	114.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	712	93	44	915	38	109	9	21	35	12	62
Future Volume (vph)	47	712	93	44	915	38	109	9	21	35	12	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	35.0		0.0	15.0		0.0	0.0		0.0	5.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Frt		0.983			0.994			0.980			0.875	
Flt Protected	0.950			0.950				0.962		0.950		
Satd. Flow (prot)	1745	3475	0	1745	3550	0	0	1787	0	1745	1617	0
Flt Permitted	0.260			0.313				0.712		0.719		
Satd. Flow (perm)	476	3475	0	573	3550	0	0	1321	0	1317	1617	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		27			8			7				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.1			45.8			72.9			96.4	
Travel Time (s)		8.7			3.3			5.2			6.9	
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	49	749	98	46	963	40	115	9	22	37	13	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	847	0	46	1003	0	0	146	0	37	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	40.0	40.0		40.0	40.0		32.0	32.0		32.0	32.0	
Total Split (s)	87.0	87.0		87.0	87.0		33.0	33.0		33.0	33.0	
Total Split (%)	72.5%	72.5%		72.5%	72.5%		27.5%	27.5%		27.5%	27.5%	
Maximum Green (s)	80.0	80.0		80.0	80.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0			-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	16.0	16.0		16.0	16.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	84.8	84.8		84.8	84.8			20.0		20.0	20.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.18		0.18	0.18	
v/c Ratio	0.14	0.32		0.11	0.38			0.61		0.16	0.27	
Control Delay	6.1	5.3		5.6	5.8			51.1		39.1	41.3	
Queue Delay	0.0	0.7		0.0	0.0			0.0		0.0	0.0	
Total Delay	6.1	6.0		5.6	5.8			51.1		39.1	41.3	
LOS	A	A		A	A			D		D	D	
Approach Delay		6.0			5.8			51.1			40.6	
Approach LOS		A			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 112.8			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Pearl Street & Lakeshore Road

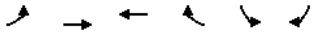


Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	49	847	46	1003	146	37	78
v/c Ratio	0.14	0.32	0.11	0.38	0.61	0.16	0.27
Control Delay	6.1	5.3	5.6	5.8	51.1	39.1	41.3
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.0	5.6	5.8	51.1	39.1	41.3
Queue Length 50th (m)	2.7	27.4	2.4	35.3	29.4	7.2	15.5
Queue Length 95th (m)	8.6	47.7	7.7	60.2	51.0	16.8	29.4
Internal Link Dist (m)		97.1		21.8	48.9		72.4
Turn Bay Length (m)	35.0		15.0			5.0	
Base Capacity (vph)	357	2618	430	2670	344	338	416
Starvation Cap Reductn	0	1312	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.65	0.11	0.38	0.42	0.11	0.19

Intersection Summary

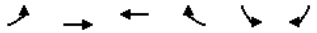
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	712	93	44	915	38	109	9	21	35	12	62
Future Volume (vph)	47	712	93	44	915	38	109	9	21	35	12	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99			0.98		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1741	3474		1741	3550			1785		1740	1617	
Flt Permitted	0.26	1.00		0.31	1.00			0.71		0.72	1.00	
Satd. Flow (perm)	477	3474		573	3550			1321		1317	1617	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	749	98	46	963	40	115	9	22	37	13	65
RTOR Reduction (vph)	0	7	0	0	2	0	0	6	0	0	0	0
Lane Group Flow (vph)	49	840	0	46	1001	0	0	140	0	37	78	0
Confl. Peds. (#/hr)	6		5	5		6	1		3	3		1
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	81.8	81.8		81.8	81.8			17.0		17.0	17.0	
Effective Green, g (s)	84.8	84.8		84.8	84.8			20.0		20.0	20.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.18		0.18	0.18	
Clearance Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	358	2611		430	2668			234		233	286	
v/s Ratio Prot		0.24			c0.28						0.05	
v/s Ratio Perm	0.10			0.08				c0.11		0.03		
v/c Ratio	0.14	0.32		0.11	0.38			0.60		0.16	0.27	
Uniform Delay, d1	3.9	4.6		3.8	4.8			42.7		39.3	40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.3		0.5	0.4			4.1		0.3	0.5	
Delay (s)	4.7	4.9		4.3	5.2			46.8		39.6	40.6	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		4.9			5.2			46.8			40.3	
Approach LOS		A			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	112.8	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	97	636	978	50	16	38
Future Volume (vph)	97	636	978	50	16	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.905	
Flt Protected	0.950				0.985	
Satd. Flow (prot)	1694	1863	1869	0	1694	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1694	1863	1869	0	1694	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		72.1	139.6		56.1	
Travel Time (s)		5.2	10.1		4.0	
Confl. Peds. (#/hr)	6			6		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	2%	1%	0%	0%	0%
Adj. Flow (vph)	101	663	1019	52	17	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	663	1071	0	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	97	636	978	50	16	38
Future Volume (Veh/h)	97	636	978	50	16	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	101	662	1019	52	17	40
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)		118				
pX, platoon unblocked					0.89	
vC, conflicting volume	1077				1915	1051
vC1, stage 1 conf vol					1051	
vC2, stage 2 conf vol					864	
vCu, unblocked vol	1077				1964	1051
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				93	86
cM capacity (veh/h)	640				238	277

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	101	662	1071	57
Volume Left	101	0	0	17
Volume Right	0	0	52	40
cSH	640	1700	1700	264
Volume to Capacity	0.16	0.39	0.63	0.22
Queue Length 95th (m)	4.5	0.0	0.0	6.4
Control Delay (s)	11.7	0.0	0.0	22.4
Lane LOS	B			C
Approach Delay (s)	1.5		0.0	22.4
Approach LOS				C

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization		73.2%	ICU Level of Service	D
Analysis Period (min)		15		

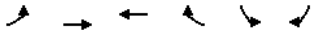
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	640	2	52	1038	0	4	0	46	0	0	0
Future Volume (vph)	23	640	2	52	1038	0	4	0	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	10.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.875				
Flt Protected	0.950			0.950				0.996				
Satd. Flow (prot)	1805	1863	0	1745	1845	0	0	1656	0	0	1900	0
Flt Permitted	0.950			0.950				0.996				
Satd. Flow (perm)	1805	1863	0	1745	1845	0	0	1656	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			71.0			66.9			42.4	
Travel Time (s)		10.1			5.1			4.8			3.1	
Confl. Peds. (#/hr)	5		1	1		5						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	681	2	55	1104	0	4	0	49	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	683	0	55	1104	0	0	53	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	640	2	52	1038	0	4	0	46	0	0	0
Future Volume (Veh/h)	23	640	2	52	1038	0	4	0	46	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	24	681	2	55	1104	0	4	0	49	0	0	0
Pedestrians								1			5	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (m)		258										
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	1109			684			1945	1950	683	1997	1951	1109
vC1, stage 1 conf vol							731	731		1219	1219	
vC2, stage 2 conf vol							1214	1219		778	732	
vCu, unblocked vol	1109			580			2002	2008	578	2061	2009	1109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			94			98	100	89	100	100	100
cM capacity (veh/h)	634			890			166	188	460	163	196	256

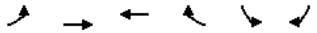
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	24	683	55	1104	53	0
Volume Left	24	0	55	0	4	0
Volume Right	0	2	0	0	49	0
cSH	634	1700	890	1700	406	1700
Volume to Capacity	0.04	0.40	0.06	0.65	0.13	0.00
Queue Length 95th (m)	0.9	0.0	1.6	0.0	3.6	0.0
Control Delay (s)	10.9	0.0	9.3	0.0	15.2	0.0
Lane LOS	B		A		C	A
Approach Delay (s)	0.4		0.4		15.2	0.0
Approach LOS					C	A

Intersection Summary					
Average Delay		0.8			
Intersection Capacity Utilization		64.6%	ICU Level of Service		C
Analysis Period (min)		15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	39	36	31	16	29
Future Volume (vph)	31	39	36	31	16	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.937		0.912	
Flt Protected		0.978			0.983	
Satd. Flow (prot)	0	1822	1745	0	1670	0
Flt Permitted		0.978			0.983	
Satd. Flow (perm)	0	1822	1745	0	1670	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		31.0	20.9		36.4	
Travel Time (s)		2.2	1.5		2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	42	39	34	17	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	76	73	0	49	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

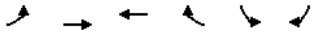
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	39	36	31	16	29
Future Volume (Veh/h)	31	39	36	31	16	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	42	39	34	17	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		104				
pX, platoon unblocked						
vC, conflicting volume	73				166	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73				166	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	97
cM capacity (veh/h)	1527				806	1011

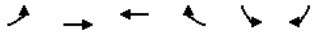
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	73	49
Volume Left	34	0	17
Volume Right	0	34	32
cSH	1527	1700	929
Volume to Capacity	0.02	0.04	0.05
Queue Length 95th (m)	0.5	0.0	1.3
Control Delay (s)	3.4	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	3.4	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	52	64	3	2	3
Future Volume (vph)	3	52	64	3	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.919	
Flt Protected		0.998			0.980	
Satd. Flow (prot)	0	1859	1852	0	1678	0
Flt Permitted		0.998			0.980	
Satd. Flow (perm)	0	1859	1852	0	1678	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		20.9	108.1		33.1	
Travel Time (s)		1.5	7.8		2.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	57	70	3	2	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	60	73	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	52	64	3	2	3
Future Volume (Veh/h)	3	52	64	3	2	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	57	70	3	2	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		125				
pX, platoon unblocked						
vC, conflicting volume	73				134	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73				134	72
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1527				857	991

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	60	73	5
Volume Left	3	0	2
Volume Right	0	3	3
cSH	1527	1700	933
Volume to Capacity	0.00	0.04	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.4	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	8.9
Approach LOS			A

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		15.2%	ICU Level of Service	A
Analysis Period (min)		15		

Appendix H

Detailed MMLOS inputs

File Information

Project number	220617
Project manager	SC
Evaluation done by	CC
Date Prepared	10-Dec-2024

Site Information

Municipality:	City of Burlington
North leg name:	Elizabeth Street
South leg name:	Elizabeth Street
West leg name:	Lakeshore Road
East leg name:	Lakeshore Road

Intersection name	**Elizabeth Street & Lakeshore Road**

MODE	MEASURE	GRADE	LOS
PEDS	Enhanced Pedestrian Measures (measures per approach)	C	**D**
	Average Effective Turning Radius (m)	C	
	Signal Cycle Length (s)	E	
	Number of Uncontrolled Conflicts (conflicts per approach)	E	
BIKES	Enhanced Bicycle Measures (measures per approach)	F	**E**
	Average Effective Turning Radius (m)	C	
	Signal Cycle Length (s)	E	
	Number of Uncontrolled Conflicts (conflicts per approach)	F	
BUSES	Transit Priority Measures (measures per approach)	F	**C**
	Transit Movement Delay (s)	A	
	Pedestrian Level of Service	D	
TRUCKS	Average Effective Turning Radius (m)	E	**C**
	Car Level of Service	B	
CARS	Percentage of Turning Movements with Dedicated Lanes	C	**B**
	Intersection Delay (s)	B	

File Information

Project number	220617
Project manager	SC
Evaluation done by	CC
Date Prepared	10-Dec-2024

Site Information

Municipality:	City of Burlington
North leg name:	Martha Street
South leg name:	
West leg name:	Lakeshore Rd
East leg name:	Lakeshore Rd

Intersection name	**Martha Street & Lakeshore Rd**

MODE	MEASURE	GRADE	LOS
PEDS	Average Crossing Distance (m)	F	**E**
	Marked Controlled Crossings (%)	E	
	Average Effective Turning Radius (m)	E	
BIKES	Presence of Bicycle Facilities (% of legs)	F	**D**
	Average Effective Turning Radius (m)	E	
	Requirement to Stop (% of cyclists)	C	
BUSES	Transit Movement Delay (s)	A	**C**
	Pedestrian Level of Service	E	
TRUCKS	Average Effective Turning Radius (m)	D	**B**
	Car Level of Service	A	
CARS	Intersection Delay (s)	A	**A**

File Information

Project number	220617
Project manager	SC
Evaluation done by	CC
Date Prepared	10-Dec-2024

Site Information

Municipality:	City of Burlington
North leg name:	Private Driveway
South leg name:	Old Lakeshore Rd
West leg name:	Lakeshore Rd
East leg name:	Lakeshore Rd

Intersection name	**Private Driveway/Old Lakeshore Rd & Lakeshore**

MODE	MEASURE	GRADE	LOS
PEDS	Average Crossing Distance (m)	D	**C**
	Marked Controlled Crossings (%)	E	
	Average Effective Turning Radius (m)	A	
BIKES	Presence of Bicycle Facilities (% of legs)	F	**C**
	Average Effective Turning Radius (m)	A	
	Requirement to Stop (% of cyclists)	C	
BUSES	Transit Movement Delay (s)	A	**B**
	Pedestrian Level of Service	C	
TRUCKS	Average Effective Turning Radius (m)	F	**C**
	Car Level of Service	A	
CARS	Intersection Delay (s)	A	**A**

File Information

Project number	220617
Project manager	SC
Evaluation done by	CC
Date Prepared	10-Dec-2024

Site Information

Municipality:	City of Burlington
North leg name:	Pearl St
South leg name:	Old Lakeshore Rd
West leg name:	Lakeshore Rd
East leg name:	Lakeshore Rd

Intersection name	**Pearl St/Old Lakeshore Rd & Lakeshore Rd**

MODE	MEASURE	GRADE	LOS
PEDS	Enhanced Pedestrian Measures (measures per approach)	C	**C**
	Average Effective Turning Radius (m)	B	
	Signal Cycle Length (s)	E	
	Number of Uncontrolled Conflicts (conflicts per approach)	E	
BIKES	Enhanced Bicycle Measures (measures per approach)	F	**D**
	Average Effective Turning Radius (m)	B	
	Signal Cycle Length (s)	E	
	Number of Uncontrolled Conflicts (conflicts per approach)	F	
BUSES	Transit Priority Measures (measures per approach)	F	**D**
	Transit Movement Delay (s)	D	
	Pedestrian Level of Service	C	
TRUCKS	Average Effective Turning Radius (m)	F	**D**
	Car Level of Service	B	
CARS	Percentage of Turning Movements with Dedicated Lanes	B	**B**
	Intersection Delay (s)	B	

Appendix I

OTM Signal Warrants

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)

Horizon Year: Total Traffic
Region/City/Township: City of Burlington

Major Street: Lakeshore Road
North/South: N
Minor Street: Martha Street

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	**No**	Justification for new intersections with forecast traffic
120% Satisfied	**No**	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Lakeshore Road						Martha Street						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	41	901			513	14				28		58	10
PM Peak Hour	97	636			978	50				16		38	0
Average Hourly Volume	**35**	**384**	**0**	**0**	**373**	**16**	**0**	**0**	**0**	**11**	**0**	**24**	**3**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	843
1B - Mino	35
2A - Majo	808
2B - Cros	14

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	843
					% Fulfilled	**117.0%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	35
					% Fulfilled	**13.7%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	808
					% Fulfilled	**112.2%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	14
					% Fulfilled	**18.0%**

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)

Horizon Year: Total Traffic
Region/City/Township: City of Burlington

Major Street: Lakeshore Road
Minor Street: Old Lakeshore Road
North/South: N

Number of Approach Lanes: 1
Tee Intersection? N
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	**No**	Justification for new intersections with forecast traffic
120% Satisfied	**No**	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Lakeshore Road						Old Lakeshore Road						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	0	923	28	17	493	0	11	0	41	0	0	0	2
PM Peak Hour	23	640	2	52	1038	0	4	0	46	0	0	0	0
Average Hourly Volume	**6**	**391**	**8**	**17**	**383**	**0**	**4**	**0**	**22**	**0**	**0**	**0**	**1**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	830
1B - Mino	26
2A - Majo	804
2B - Cros	4

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	830
					% Fulfilled	**115.2%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	26
					% Fulfilled	**15.0%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	804
					% Fulfilled	**111.7%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	4
					% Fulfilled	**5.7%**

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)

Horizon Year: Total Traffic
Region/City/Township: City of Burlington

Major Street: Old Lakeshore Road
Minor Street: Driveway 1
North/South: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	**No**	Justification for new intersections with forecast traffic
120% Satisfied	**No**	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Old Lakeshore Road						Driveway 1						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	16	74			90	7				23		25	0
PM Peak Hour	31	39			36	31				16		29	0
Average Hourly Volume	**12**	**28**	**0**	**0**	**32**	**10**	**0**	**0**	**0**	**10**	**0**	**14**	**0**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	104
1B - Mino	23
2A - Majo	81
2B - Cros	10

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	104
					% Fulfilled	**14.5%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	23
					% Fulfilled	**9.1%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	81
					% Fulfilled	**11.3%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	10
					% Fulfilled	**13.0%**

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)

Horizon Year: Total Traffic
Region/City/Township: City of Burlington

Major Street: Old Lakeshore Road
North/South: N
Minor Street: Driveway 2

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	**No**	Justification for new intersections with forecast traffic
120% Satisfied	**No**	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Old Lakeshore Road						Driveway 2						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	2	95			95	1				3		2	0
PM Peak Hour	3	52			64	3				2		3	0
Average Hourly Volume	**1**	**37**	**0**	**0**	**40**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	81
1B - Mino	3
2A - Majo	79
2B - Cros	1

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	81
					% Fulfilled	**11.3%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	3
					% Fulfilled	**1.0%**

Warrant 2 - Delay To Cross Traffic

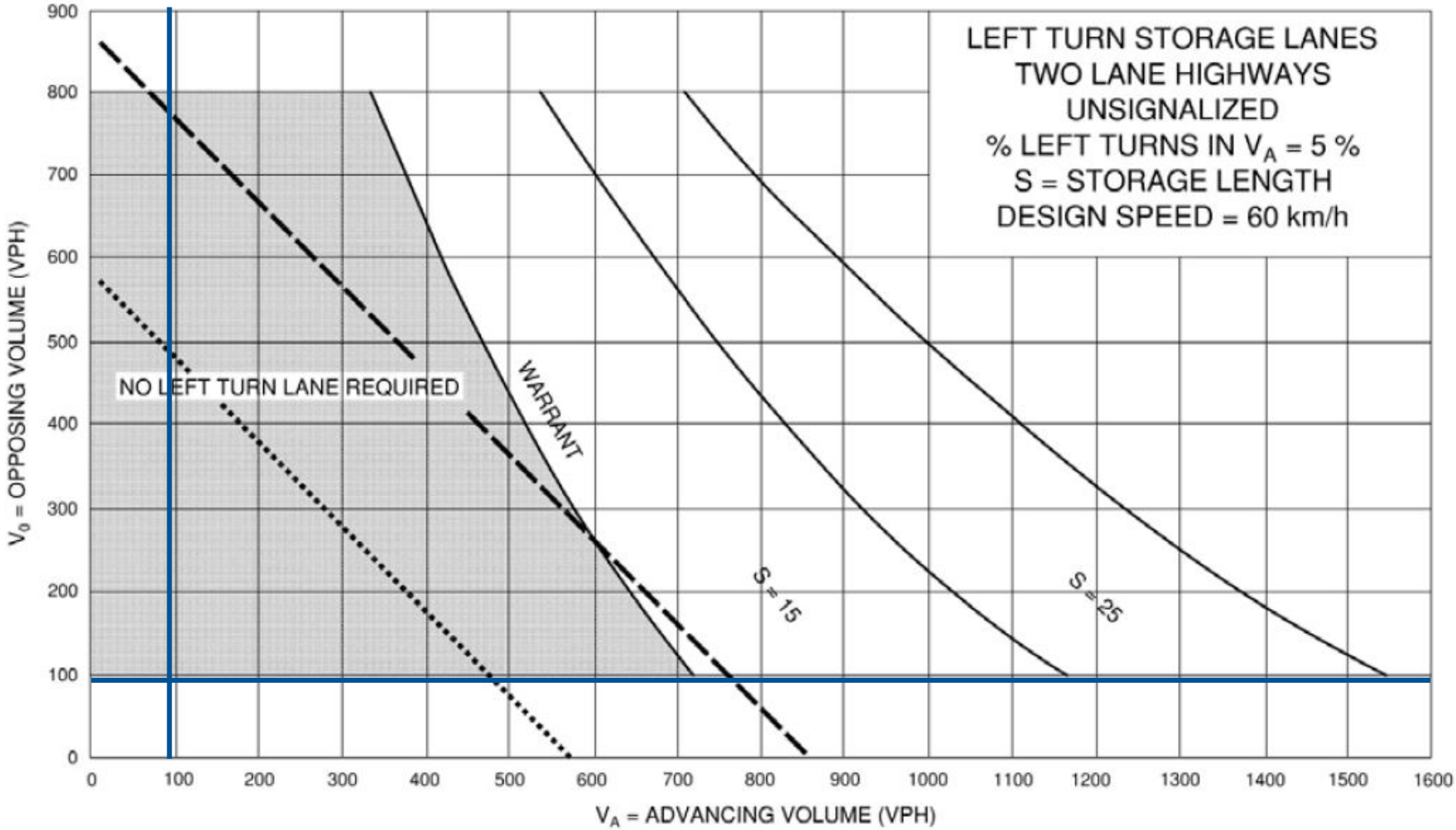
2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	79
					% Fulfilled	**10.9%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	1
					% Fulfilled	**1.7%**

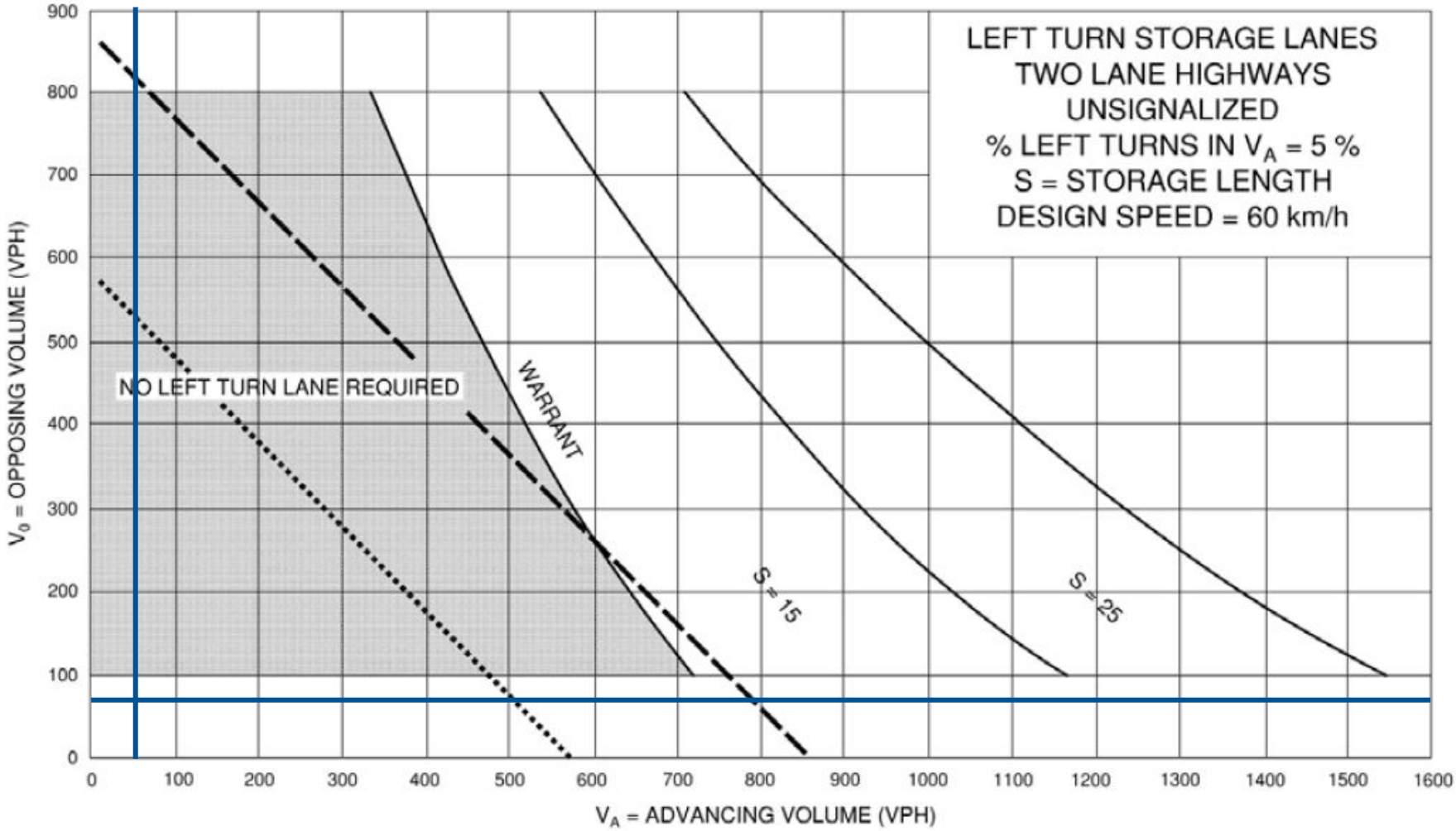
Appendix J

MTO Left-Turn Lane Warrants

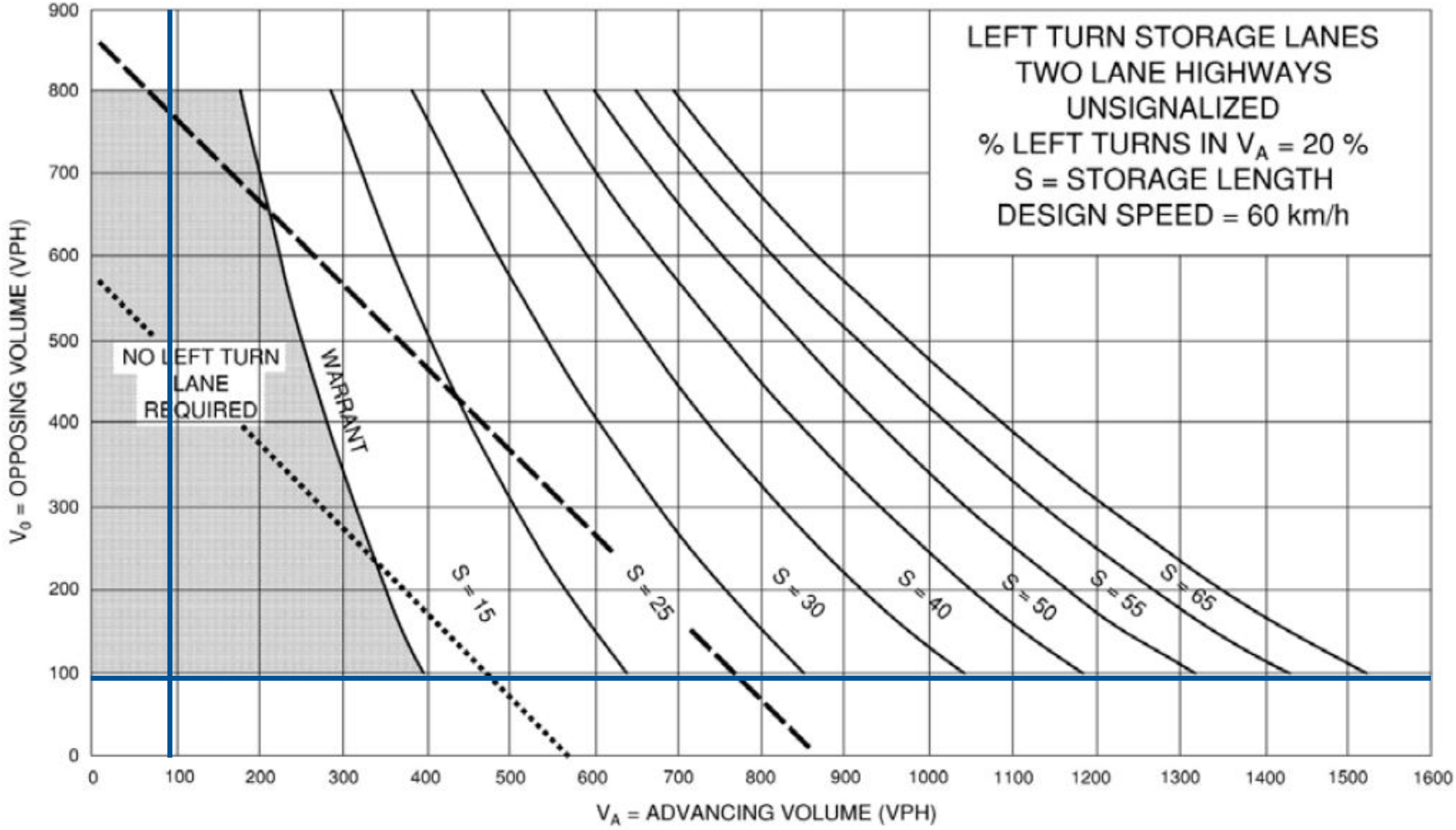




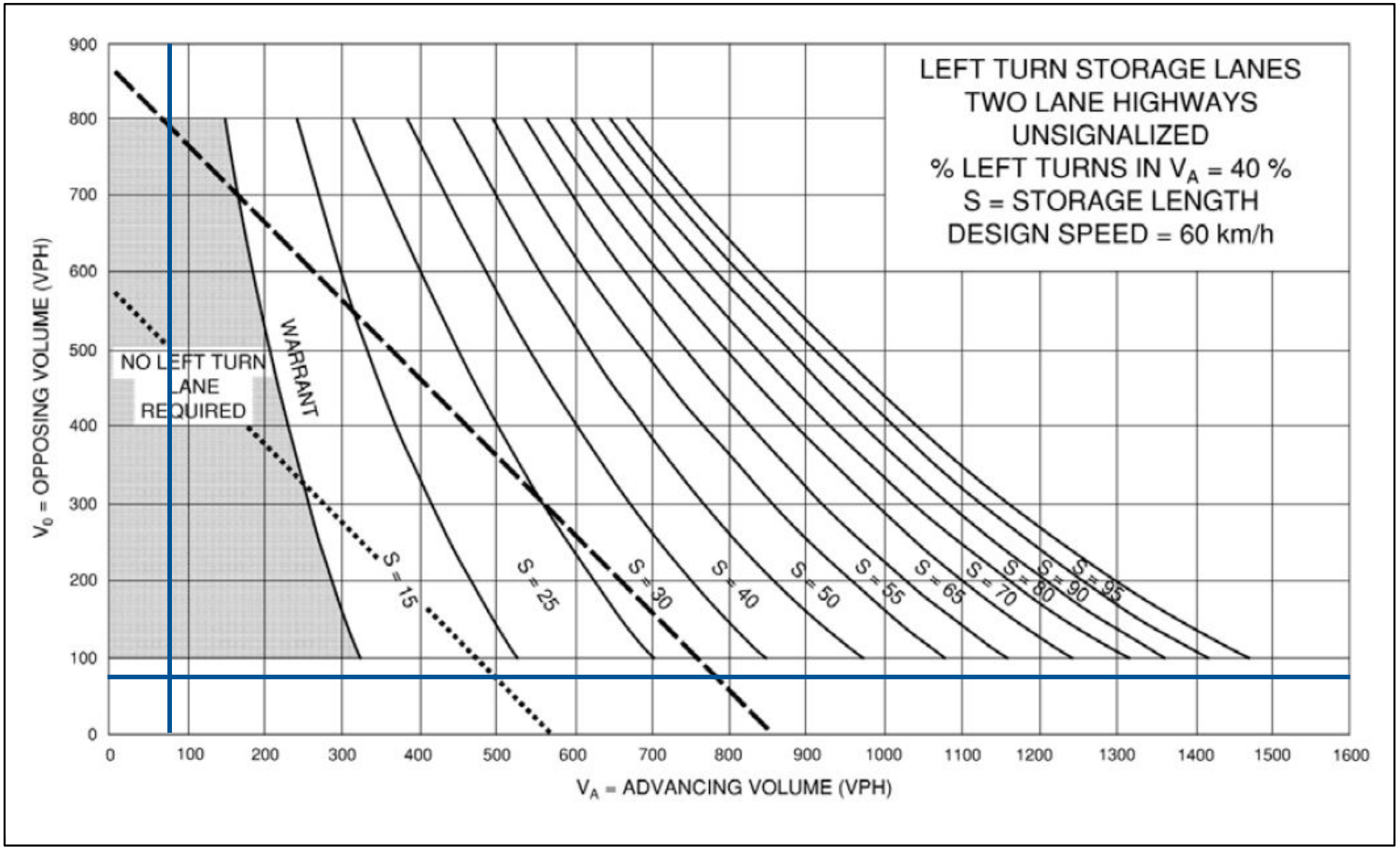
Intersection: Old Lakeshore Road & Driveway 1
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: AM Peak Hour



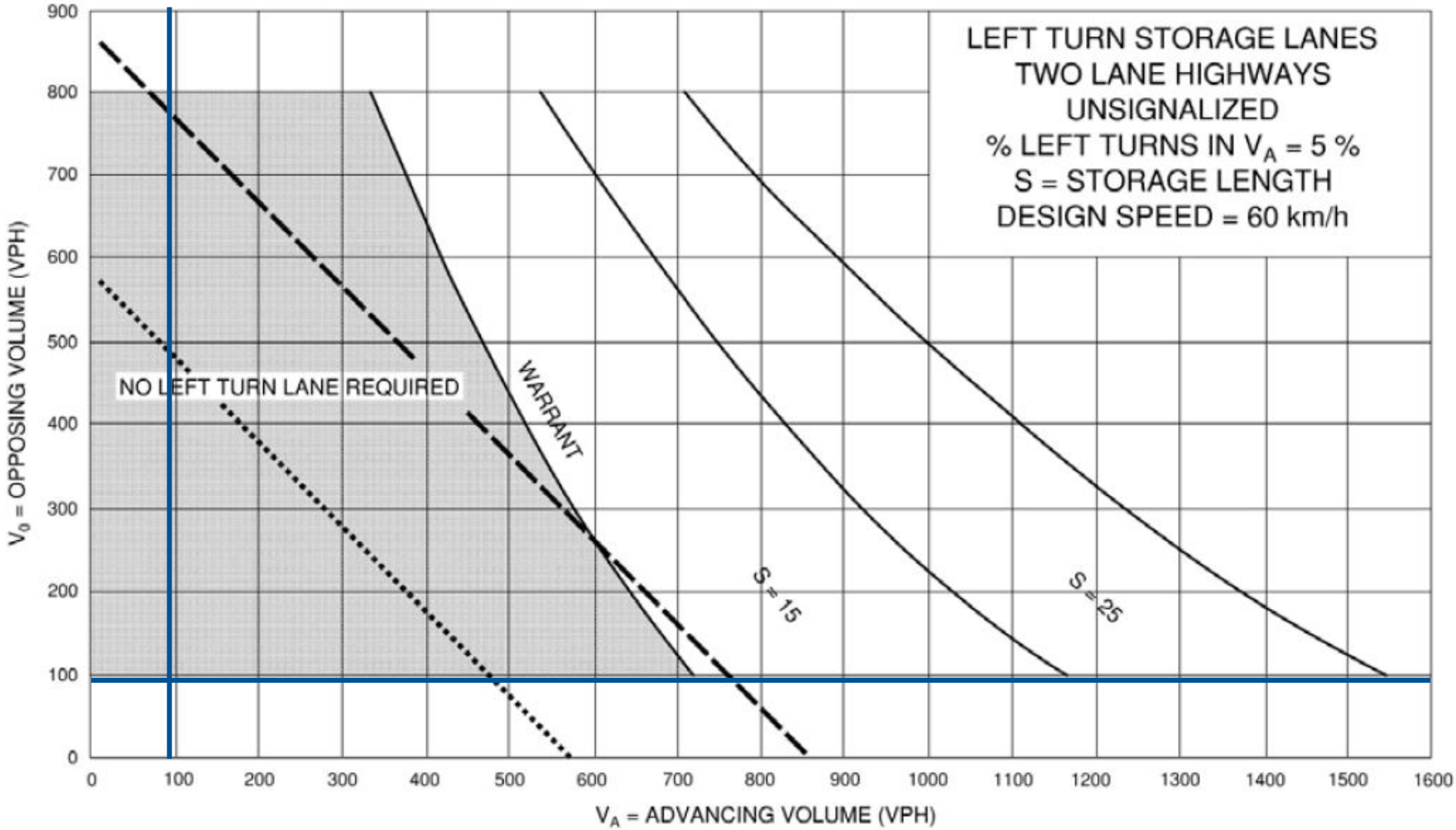
Intersection: Old Lakeshore Road & Driveway 1
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: PM Peak Hour



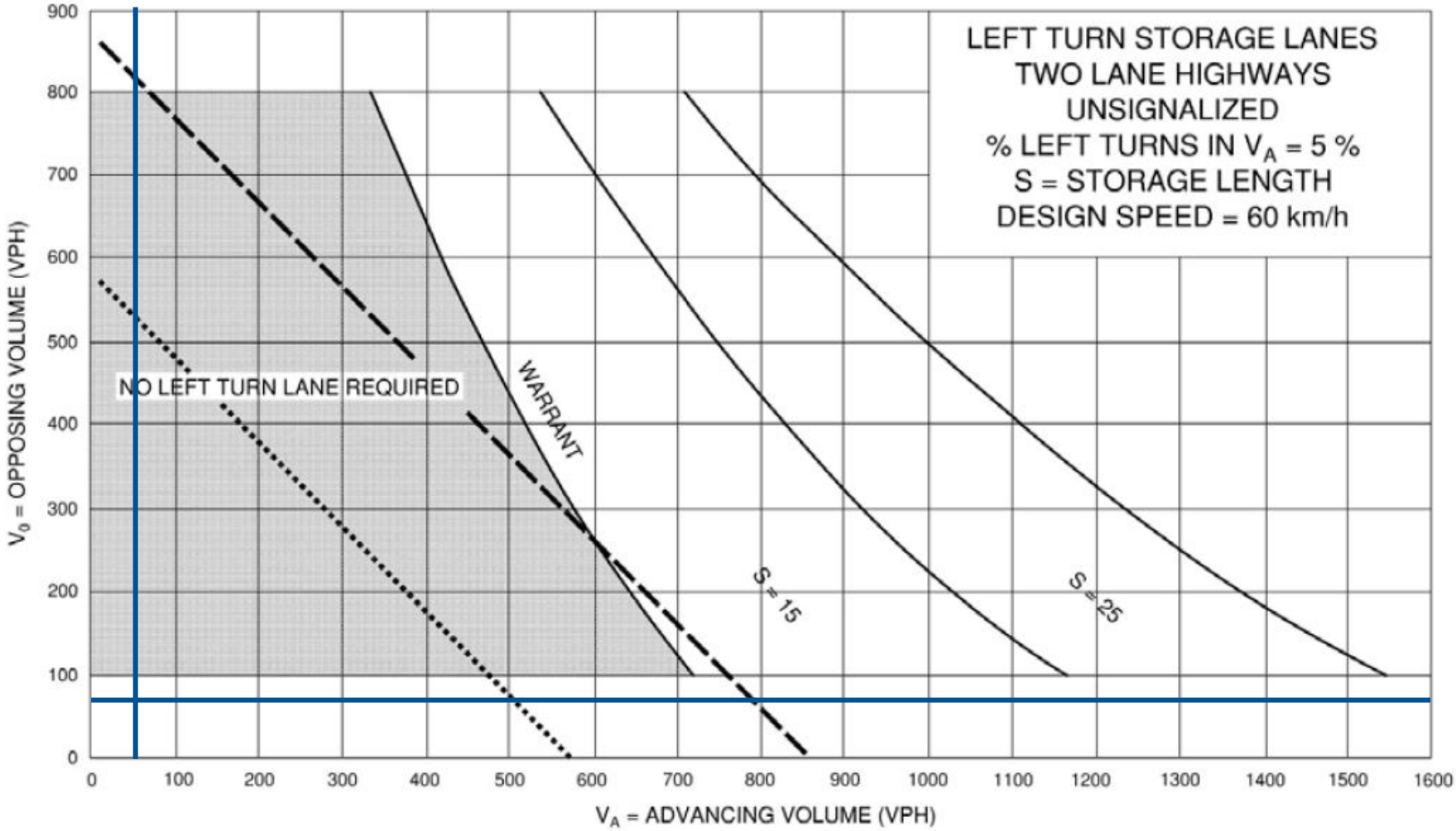
Intersection: Old Lakeshore Road & Driveway 2
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: AM Peak Hour



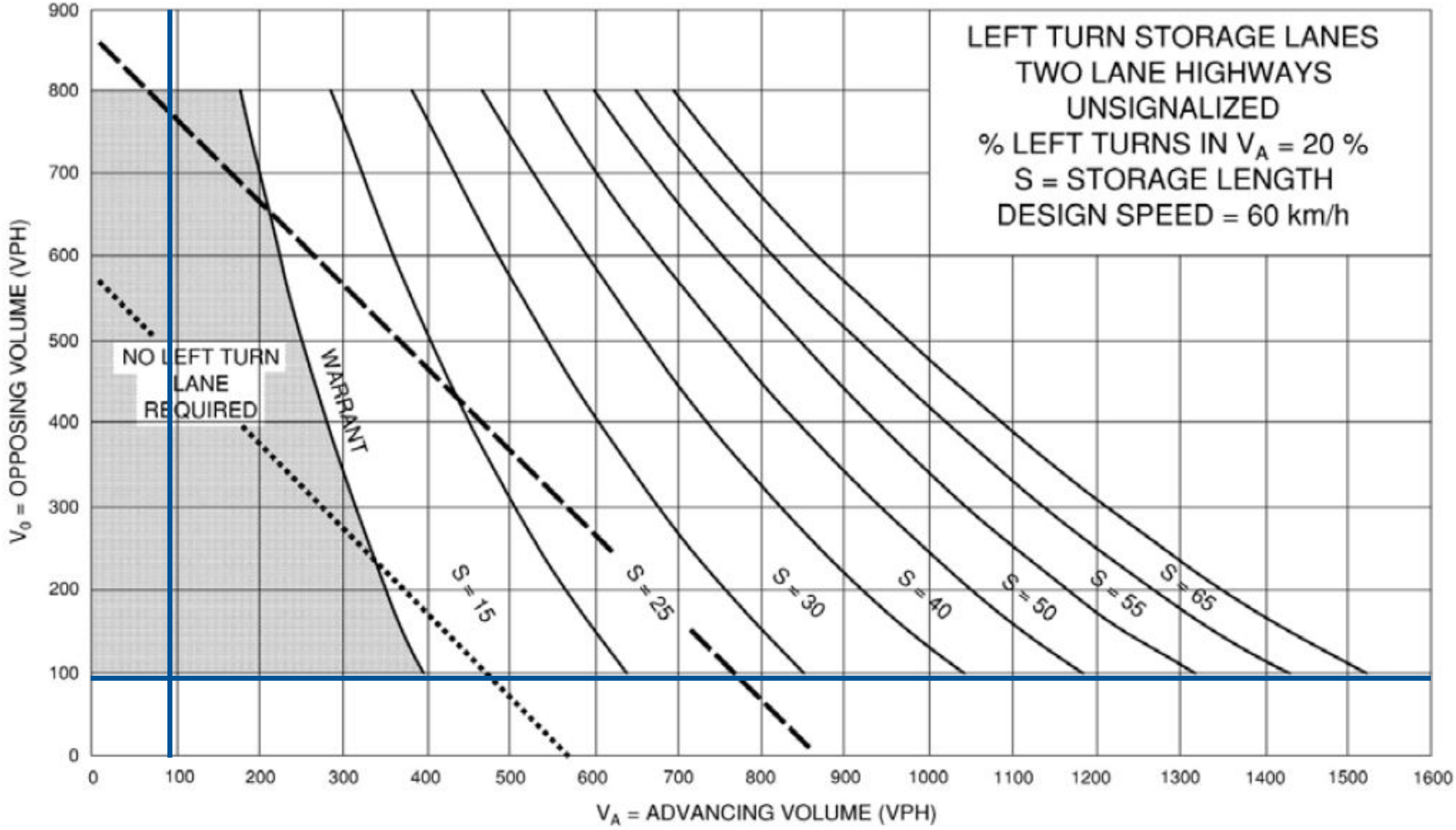
Intersection: Old Lakeshore Road & Driveway 2
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: PM Peak Hour



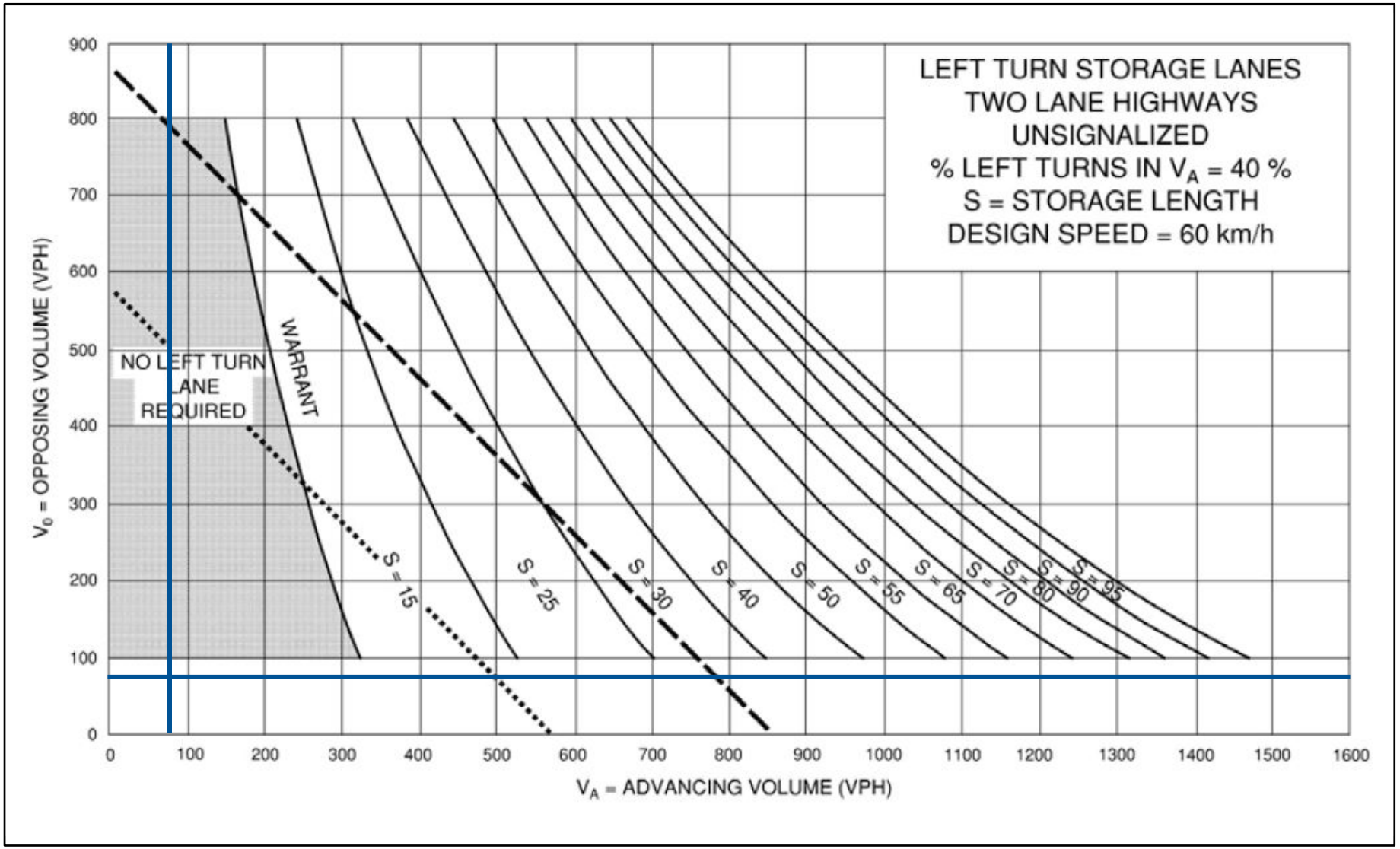
Intersection: Old Lakeshore Road & Driveway 1
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: AM Peak Hour



Intersection: Old Lakeshore Road & Driveway 1
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: PM Peak Hour



Intersection: Old Lakeshore Road & Driveway 2
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: AM Peak Hour



Intersection: Old Lakeshore Road & Driveway 2
Direction: Eastbound Left-Turn
Horizon: Total Traffic
Peak Hour: PM Peak Hour

Appendix K

Parking Study Data

551 Maple Avenue - Residential Parking Utilization Survey (186 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	60	181	0.32	43	198	0.23	52	189	0.28	58	183	0.31	57	184	0.30
4:30	56	185	0.30	39	202	0.21	53	188	0.28	60	181	0.32	56	185	0.30
4:45	57	184	0.31	47	194	0.25	60	181	0.32	60	181	0.32	59	182	0.32
5:00	60	181	0.32	52	189	0.28	61	180	0.33	63	178	0.34	61	180	0.33
5:15	68	173	0.37	56	185	0.30	60	181	0.32	65	176	0.35	64	177	0.35
5:30	80	161	0.43	60	181	0.32	76	165	0.41	68	173	0.37	75	166	0.40
5:45	82	159	0.44	78	163	0.42	84	157	0.45	69	172	0.37	78	163	0.42
6:00	84	157	0.45	89	152	0.48	84	157	0.45	72	169	0.39	80	161	0.43
6:15	93	148	0.50	90	151	0.48	88	153	0.47	88	153	0.47	90	151	0.48
6:30	96	145	0.52	101	140	0.54	93	148	0.50	95	146	0.51	95	146	0.51
6:45	93	148	0.50	102	139	0.55	96	145	0.52	103	138	0.55	97	144	0.52
7:00	103	138	0.55	110	131	0.59	98	143	0.53	108	133	0.58	103	138	0.55
7:15	112	129	0.60	118	123	0.63	104	137	0.56	111	130	0.60	109	132	0.59
7:30	110	131	0.59	130	111	0.70	110	131	0.59	115	126	0.62	112	129	0.60
7:45	120	121	0.65	129	112	0.69	118	123	0.63	122	119	0.66	120	121	0.65
8:00	132	109	0.71	133	108	0.72	125	116	0.67	128	113	0.69	128	113	0.69
8:15	134	107	0.72	131	110	0.70	132	109	0.71	130	111	0.70	132	109	0.71
8:30	133	108	0.72	146	95	0.78	138	103	0.74	138	103	0.74	136	105	0.73
8:45	134	107	0.72	149	92	0.80	142	99	0.76	135	106	0.73	137	104	0.74
9:00	140	101	0.75	155	86	0.83	147	94	0.79	132	109	0.71	140	101	0.75
9:15	141	100	0.76	154	87	0.83	145	96	0.78	132	109	0.71	139	102	0.75
9:30	143	98	0.77	154	87	0.83	150	91	0.81	145	96	0.78	146	95	0.78
9:45	146	95	0.78	153	88	0.82	151	90	0.81	148	93	0.80	148	93	0.80
10:00	146	95	0.78	153	88	0.82	154	87	0.83	148	93	0.80	149	92	0.80
Maximum Observed	**146**	**185**	**0.78**	**155**	**202**	**0.83**	**154**	**189**	**0.83**	**148**	**183**	**0.80**	**149**	**185**	**0.80**
Minimum Observed	**56**	**95**	**0.30**	**39**	**86**	**0.21**	**52**	**87**	**0.28**	**58**	**93**	**0.31**	**56**	**92**	**0.30**
Average Observed	**105**	**136**	**0.57**	**107**	**134**	**0.58**	**105**	**136**	**0.56**	**104**	**137**	**0.56**	**105**	**136**	**0.56**

551 Maple Avenue - Visitor Parking Utilization Survey (186 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	12	35	0.06	9	38	0.05	15	32	0.08	12	35	0.06	13	34	0.07
4:30	8	39	0.04	7	40	0.04	15	32	0.08	9	38	0.05	11	36	0.06
4:45	12	35	0.06	11	36	0.06	15	32	0.08	13	34	0.07	13	34	0.07
5:00	13	34	0.07	13	34	0.07	12	35	0.06	13	34	0.07	13	34	0.07
5:15	13	34	0.07	13	34	0.07	15	32	0.08	13	34	0.07	14	33	0.07
5:30	15	32	0.08	13	34	0.07	11	36	0.06	12	35	0.06	13	34	0.07
5:45	12	35	0.06	15	32	0.08	12	35	0.06	12	35	0.06	12	35	0.06
6:00	19	28	0.10	13	34	0.07	11	36	0.06	13	34	0.07	14	33	0.08
6:15	17	30	0.09	15	32	0.08	15	32	0.08	16	31	0.09	16	31	0.09
6:30	15	32	0.08	15	32	0.08	12	35	0.06	15	32	0.08	14	33	0.08
6:45	13	34	0.07	16	31	0.09	13	34	0.07	15	32	0.08	14	33	0.07
7:00	15	32	0.08	20	27	0.11	15	32	0.08	16	31	0.09	15	32	0.08
7:15	15	32	0.08	21	26	0.11	19	28	0.10	19	28	0.10	18	29	0.09
7:30	15	32	0.08	22	25	0.12	22	25	0.12	19	28	0.10	19	28	0.10
7:45	15	32	0.08	24	23	0.13	17	30	0.09	19	28	0.10	17	30	0.09
8:00	15	32	0.08	25	22	0.13	15	32	0.08	19	28	0.10	16	31	0.09
8:15	16	31	0.09	23	24	0.12	17	30	0.09	19	28	0.10	17	30	0.09
8:30	16	31	0.09	20	27	0.11	15	32	0.08	17	30	0.09	16	31	0.09
8:45	15	32	0.08	23	24	0.12	13	34	0.07	16	31	0.09	15	32	0.08
9:00	15	32	0.08	23	24	0.12	13	34	0.07	17	30	0.09	15	32	0.08
9:15	16	31	0.09	20	27	0.11	15	32	0.08	17	30	0.09	16	31	0.09
9:30	16	31	0.09	16	31	0.09	13	34	0.07	15	32	0.08	15	32	0.08
9:45	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.09
10:00	15	32	0.08	16	31	0.09	16	31	0.09	16	31	0.09	16	31	0.08
Maximum Observed	**19**	**39**	**0.10**	**25**	**40**	**0.13**	**22**	**36**	**0.12**	**19**	**38**	**0.10**	**19**	**36**	**0.10**
Minimum Observed	**8**	**28**	**0.04**	**7**	**22**	**0.04**	**11**	**25**	**0.06**	**9**	**28**	**0.05**	**11**	**28**	**0.06**
Average Observed	**15**	**32**	**0.08**	**17**	**30**	**0.09**	**15**	**32**	**0.08**	**15**	**32**	**0.08**	**15**	**32**	**0.08**

360 Pearl Street - Residential Parking Utilization Survey (75 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	13	101	0.17	21	93	0.28	18	96	0.24	18	96	0.24	16	225	0.22
4:30	12	102	0.16	20	94	0.27	17	97	0.23	18	96	0.24	16	225	0.21
4:45	15	99	0.20	20	94	0.27	19	95	0.25	21	93	0.28	18	223	0.24
5:00	17	97	0.23	21	93	0.28	20	94	0.27	22	92	0.29	20	221	0.26
5:15	19	95	0.25	24	90	0.32	22	92	0.29	21	93	0.28	21	220	0.28
5:30	20	94	0.27	29	85	0.39	26	88	0.35	28	86	0.37	25	216	0.33
5:45	28	86	0.37	30	84	0.40	30	84	0.40	31	83	0.41	30	211	0.40
6:00	32	82	0.43	31	83	0.41	31	83	0.41	31	83	0.41	31	210	0.42
6:15	33	81	0.44	35	79	0.47	33	81	0.44	32	82	0.43	33	208	0.44
6:30	37	77	0.49	36	78	0.48	36	78	0.48	35	79	0.47	36	205	0.48
6:45	38	76	0.51	36	78	0.48	37	77	0.49	36	78	0.48	37	204	0.49
7:00	41	73	0.55	40	74	0.53	39	75	0.52	37	77	0.49	39	202	0.52
7:15	44	70	0.59	42	72	0.56	42	72	0.56	39	75	0.52	42	199	0.56
7:30	49	65	0.65	41	73	0.55	44	70	0.59	41	73	0.55	45	196	0.60
7:45	48	66	0.64	45	69	0.60	46	68	0.61	45	69	0.60	46	195	0.62
8:00	50	64	0.67	50	64	0.67	50	64	0.67	47	67	0.63	49	192	0.65
8:15	53	61	0.71	51	63	0.68	52	62	0.69	50	64	0.67	52	189	0.69
8:30	55	59	0.73	51	63	0.68	53	61	0.71	53	61	0.71	54	187	0.72
8:45	56	58	0.75	51	63	0.68	54	60	0.72	54	60	0.72	55	186	0.73
9:00	56	58	0.75	53	61	0.71	56	58	0.75	56	58	0.75	56	185	0.75
9:15	58	56	0.77	54	60	0.72	56	58	0.75	55	59	0.73	56	185	0.75
9:30	58	56	0.77	55	59	0.73	57	57	0.76	55	59	0.73	57	184	0.76
9:45	58	56	0.77	56	58	0.75	57	57	0.76	55	59	0.73	57	184	0.76
10:00	58	56	0.77	58	56	0.77	57	57	0.76	55	59	0.73	57	184	0.76
Maximum Observed	**58**	**102**	**0.77**	**58**	**94**	**0.77**	**57**	**97**	**0.76**	**56**	**96**	**0.75**	**57**	**225**	**0.76**
Minimum Observed	**12**	**56**	**0.16**	**20**	**56**	**0.27**	**17**	**57**	**0.23**	**18**	**58**	**0.24**	**16**	**184**	**0.21**
Average Observed	**40**	**75**	**0.53**	**40**	**74**	**0.53**	**40**	**74**	**0.53**	**39**	**75**	**0.52**	**39**	**202**	**0.53**

360 Pearl Street - Visitor Parking Utilization Survey (75 Units)

Time Ending	Thursday November 1, 2016			Wednesday November 2, 2016			Tuesday November 8, 2016			Wednesday November 9, 2016			Four Day Average		
	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate	Occupied	Unoccupied	Rate
4:15	7	5	0.09	7	5	0.09	9	3	0.12	5	7	0.07	7	40	0.09
4:30	6	6	0.08	7	5	0.09	10	2	0.13	5	7	0.07	7	40	0.09
4:45	6	6	0.08	7	5	0.09	8	4	0.11	4	8	0.05	6	41	0.08
5:00	7	5	0.09	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.09
5:15	7	5	0.09	7	5	0.09	8	4	0.11	6	6	0.08	7	40	0.09
5:30	8	4	0.11	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.10
5:45	6	6	0.08	8	4	0.11	8	4	0.11	6	6	0.08	7	40	0.09
6:00	5	7	0.07	7	5	0.09	8	4	0.11	6	6	0.08	6	41	0.08
6:15	6	6	0.08	6	6	0.08	8	4	0.11	6	6	0.08	7	40	0.09
6:30	7	5	0.09	7	5	0.09	7	5	0.09	5	7	0.07	6	41	0.08
6:45	7	5	0.09	7	5	0.09	7	5	0.09	6	6	0.08	7	40	0.09
7:00	7	5	0.09	7	5	0.09	8	4	0.11	6	6	0.08	7	40	0.09
7:15	5	7	0.07	8	4	0.11	8	4	0.11	6	6	0.08	6	41	0.08
7:30	5	7	0.07	8	4	0.11	7	5	0.09	5	7	0.07	6	41	0.08
7:45	5	7	0.07	7	5	0.09	6	6	0.08	5	7	0.07	5	42	0.07
8:00	6	6	0.08	8	4	0.11	6	6	0.08	4	8	0.05	5	42	0.07
8:15	6	6	0.08	7	5	0.09	5	7	0.07	4	8	0.05	5	42	0.07
8:30	6	6	0.08	7	5	0.09	5	7	0.07	4	8	0.05	5	42	0.07
8:45	5	7	0.07	6	6	0.08	4	8	0.05	3	9	0.04	4	43	0.05
9:00	5	7	0.07	5	7	0.07	4	8	0.05	3	9	0.04	4	43	0.05
9:15	5	7	0.07	5	7	0.07	3	9	0.04	2	10	0.03	3	44	0.04
9:30	4	8	0.05	5	7	0.07	3	9	0.04	3	9	0.04	3	44	0.04
9:45	4	8	0.05	5	7	0.07	3	9	0.04	4	8	0.05	4	43	0.05
10:00	4	8	0.05	2	10	0.03	3	9	0.04	4	8	0.05	4	43	0.05
Maximum Observed	**8**	**8**	**0.11**	**8**	**10**	**0.11**	**10**	**9**	**0.13**	**6**	**10**	**0.08**	**7**	**44**	**0.10**
Minimum Observed	**4**	**4**	**0.05**	**2**	**4**	**0.03**	**3**	**2**	**0.04**	**2**	**6**	**0.03**	**3**	**40**	**0.04**
Average Observed	**6**	**6**	**0.08**	**6**	**6**	**0.09**	**6**	**6**	**0.09**	**5**	**7**	**0.06**	**6**	**41**	**0.08**

Appendix C - Survey Data

City of Burlington Downtown Survey Data (April 6th - May 8th, 2021)

					Surveyed				
Address	Intensification Zone	LandUse	Date	Time (24 Hr)	Occupant (Observed)	Visitor (Observed)	Number of Units	Calculated Occupant Rate	Calculated Visitor Rate
442 Maple Ave	Primary	Apartment Building	Tues, April 6	8:00	146	5	135	1.08	0.04
442 Maple Ave	Primary	Apartment Building	Tues, April 6	9:00	148	5	135	1.10	0.04
442 Maple Ave	Primary	Apartment Building	Tues, April 6	10:00	148	6	135	1.10	0.04
505 Locust St	Primary	Apartment Building	Tues, April 6	8:30	101	0	117	0.86	
505 Locust St	Primary	Apartment Building	Tues, April 6	9:30	103	0	117	0.88	
505 Locust St	Primary	Apartment Building	Tues, April 6	10:30	103	0	117	0.88	
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	8:00	143	8	135	1.06	0.06
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	9:00	146	5	135	1.08	0.04
442 Maple Ave	Primary	Apartment Building	Thurs, April 8	10:00	145	5	135	1.07	0.04
505 Locust St	Primary	Apartment Building	Thurs, April 8	8:30	116	0	117	0.99	
505 Locust St	Primary	Apartment Building	Thurs, April 8	9:30	120	0	117	1.03	
505 Locust St	Primary	Apartment Building	Thurs, April 8	10:30	121	0	117	1.03	
505 Locust St	Primary	Apartment Building	Sat, April 17	8:30	100	0	117	0.85	
505 Locust St	Primary	Apartment Building	Sat, April 17	9:30	104	0	117	0.89	
505 Locust St	Primary	Apartment Building	Sat, April 17	10:30	107	0	117	0.91	
442 Maple Ave	Primary	Apartment Building	Sat, April 17	8:00	137	9	135	1.01	0.07
442 Maple Ave	Primary	Apartment Building	Sat, April 17	9:00	139	4	135	1.03	0.03
442 Maple Ave	Primary	Apartment Building	Sat, April 17	10:00	138	4	135	1.02	0.03
360 Pearl St	Primary	Apartment Building	Tues, April 27	8:00	87	0	75	1.16	
360 Pearl St	Primary	Apartment Building	Tues, April 27	9:00	93	0	75	1.24	
360 Pearl St	Primary	Apartment Building	Tues, April 27	10:00	94	0	75	1.25	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	8:00	75	0	75	1.00	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	9:00	78	0	75	1.04	
360 Pearl St	Primary	Apartment Building	Thurs, April 29	10:00	84	0	75	1.12	
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	8:15	36	2	39	0.92	0.05
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:15	39	1	39	1.00	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	10:00	40	1	39	1.03	0.03
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:00	61	0	60	1.02	
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	9:45	63	0	60	1.05	
1477 Lakeshore Rd	Primary	Apartment Building	Sat, May 1	10:30	63	0	60	1.05	
2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	8:00	42	1	39	1.08	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	9:00	42	1	39	1.08	0.03

2121 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	10:00	45	0	39	1.15	0.00
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	8:30	65	0	60	1.08	
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	9:30	66	0	60	1.10	
1477 Lakeshore Rd	Primary	Apartment Building	Tues, May 4	10:30	65	0	60	1.08	
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	8:00	39	1	39	1.00	0.03
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	9:00	41	0	39	1.05	0
2121 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	10:00	41	0	39	1.05	0
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	8:30	64	0	60	1.07	
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	9:30	63	0	60	1.05	
1477 Lakeshore Rd	Primary	Apartment Building	Thurs, May 6	10:30	64	0	60	1.07	
360 Pearl St	Primary	Apartment Building	Sat, May 8	8:00	69	0	75	0.92	
360 Pearl St	Primary	Apartment Building	Sat, May 8	9:00	77	0	75	1.03	
360 Pearl St	Primary	Apartment Building	Sat, May 8	10:00	78	0	75	1.04	

Appendix C - Occupant Parking Regression

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.97461193
R Square	0.949868415
Adjusted R Square	0.948702564
Standard Error	8.258974916
Observations	45

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	55574.14133	55574.14133	814.7426796	1.39874E-29
Residual	43	2933.058666	68.21066666		
Total	44	58507.2			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.613939165	3.187410031	1.133816839	0.263153198	-2.814085779	10.04196411	-2.814085779	10.04196411
Units	0.984969415	0.034507422	28.54369772	1.39874E-29	0.915378567	1.054560263	0.915378567	1.054560263

RESIDUAL OUTPUT

Observation	*dicted Vehicles Coun*	*Residuals*	*Standard Residuals*
1	136.5848102	9.415189794	1.153174532
2	136.5848102	11.41518979	1.398134975
3	136.5848102	11.41518979	1.398134975
4	118.8553607	-17.85536073	-2.186928539
5	118.8553607	-15.85536073	-1.941968096
6	118.8553607	-15.85536073	-1.941968096
7	136.5848102	6.415189794	0.785733867
8	136.5848102	9.415189794	1.153174532
9	136.5848102	8.415189794	1.030694311
10	118.8553607	-2.855360734	-0.349725215
11	118.8553607	1.144639266	0.140195671
12	118.8553607	2.144639266	0.262675893
13	118.8553607	-18.85536073	-2.309408761
14	118.8553607	-14.85536073	-1.819487874
15	118.8553607	-11.85536073	-1.45204721

PROBABILITY OUTPUT

Percentile	*Vehicles Counted*
1.111111111	36
3.333333333	39
5.555555556	39
7.777777778	40
10	41
12.22222222	41
14.44444444	42
16.66666667	42
18.88888889	45
21.11111111	61
23.33333333	63
25.55555556	63
27.77777778	63
30	64
32.22222222	64

16	136.5848102	0.415189794	0.050852538	34.44444444	65
17	136.5848102	2.415189794	0.295812981	36.66666667	65
18	136.5848102	1.415189794	0.17333276	38.88888889	66
19	77.4866453	9.513354701	1.165197792	41.11111111	69
20	77.4866453	15.5133547	1.900079121	43.33333333	75
21	77.4866453	16.5133547	2.022559343	45.55555556	77
22	77.4866453	-2.486645299	-0.304564867	47.77777778	78
23	77.4866453	0.513354701	0.062875798	50	78
24	77.4866453	6.513354701	0.797757127	52.22222222	84
25	42.02774635	-6.027746355	-0.738279709	54.44444444	87
26	42.02774635	-3.027746355	-0.370839044	56.66666667	93
27	42.02774635	-2.027746355	-0.248358823	58.88888889	94
28	62.71210407	-1.712104072	-0.209698886	61.11111111	100
29	62.71210407	0.287895928	0.035261557	63.33333333	101
30	62.71210407	0.287895928	0.035261557	65.55555556	103
31	42.02774635	-0.027746355	-0.00339838	67.77777778	103
32	42.02774635	-0.027746355	-0.00339838	70	104
33	42.02774635	2.972253645	0.364042285	72.22222222	107
34	62.71210407	2.287895928	0.280222	74.44444444	116
35	62.71210407	3.287895928	0.402702222	76.66666667	120
36	62.71210407	2.287895928	0.280222	78.88888889	121
37	42.02774635	-3.027746355	-0.370839044	81.11111111	137
38	42.02774635	-1.027746355	-0.125878601	83.33333333	138
39	42.02774635	-1.027746355	-0.125878601	85.55555556	139
40	62.71210407	1.287895928	0.157741779	87.77777778	143
41	62.71210407	0.287895928	0.035261557	90	145
42	62.71210407	1.287895928	0.157741779	92.22222222	146
43	77.4866453	-8.486645299	-1.039446197	94.44444444	146
44	77.4866453	-0.486645299	-0.059604424	96.66666667	148
45	77.4866453	0.513354701	0.062875798	98.88888889	148

Appendix C - Visitor Parking Regression

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.892217816
R Square	0.796052632
Adjusted R Square	0.783305921
Standard Error	1.312334646
Observations	18

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	107.5555556	107.5555556	62.4516129	6.49792E-07
Residual	16	27.55555556	1.722222222		
Total	17	135.1111111			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1.208333333	0.640312047	-1.887100733	0.077425904	-2.565734235	0.149067569	-2.565734235	0.149067569
Units	0.050925926	0.006444172	7.902633289	6.49792E-07	0.037264892	0.06458696	0.037264892	0.06458696

RESIDUAL OUTPUT

Observation	*Predicted Vehicles Counted*	*Residuals*	*Standard Residuals*
1	5.666666667	-0.666666667	-0.523634938
2	5.666666667	-0.666666667	-0.523634938
3	5.666666667	0.333333333	0.261817469
4	5.666666667	2.333333333	1.832722283
5	5.666666667	-0.666666667	-0.523634938
6	5.666666667	-0.666666667	-0.523634938
7	5.666666667	3.333333333	2.61817469
8	5.666666667	-1.666666667	-1.309087345
9	5.666666667	-1.666666667	-1.309087345
10	0.777777778	1.222222222	0.959997386
11	0.777777778	0.222222222	0.174544979
12	0.777777778	0.222222222	0.174544979
13	0.777777778	0.222222222	0.174544979
14	0.777777778	0.222222222	0.174544979
15	0.777777778	-0.777777778	-0.610907428
16	0.777777778	0.222222222	0.174544979
17	0.777777778	-0.777777778	-0.610907428
18	0.777777778	-0.777777778	-0.610907428

PROBABILITY OUTPUT

Percentile	*Vehicles Counted*
2.777777778	0
8.333333333	0
13.88888889	0
19.44444444	1
25	1
30.55555556	1
36.11111111	1
41.66666667	1
47.22222222	2
52.77777778	4
58.33333333	4
63.88888889	5
69.44444444	5
75	5
80.55555556	5
86.11111111	6
91.66666667	8
97.22222222	9