2085 Pine Street, City of Burlington, ON
Transportation Impact Brief

Paradigm Transportation Solutions Limited

April 2019

Project: 190106

ptsl.com

150 Pinebush Road, Suite 5A
Cambridge, ON N1R 8J8
p: 905.381.2229

www.ptsl.com

30 April 2019
Project: 190118

Nelson Reis
Pine Street Burlington Corp.
1039 Fourth Line
Milton ON L9T 6P9

Dear Mr. Reis:

RE: 2085 PINE STREET, CITY OF BURLINGTON, ON
TRANSPORTATION IMPACT BRIEF

This Transportation Impact Brief (TIB) has been prepared in support of applications for a Rezoning and Official Plan Amendment for the lands on the north side of Pine Street and west of Martha Street; municipal address 2085 Pine Street in the City of Burlington. The study was undertaken as a submission requirement in accordance with pre-submission consultation with the City and is based on a Development Concept prepared by ATA Architects (see **Figure 1 (Attached**).

The primary purpose of this study is to assess the impact of the proposal on the transportation network in the area and identify any improvements that are needed to support the proposal. In particular the study focuses on traffic operations at the existing intersections of Pine Street with Martha Street and Pearl Street. **Figure 2 (Attached)** illustrates the study area.

Proposal and Site Context

The site is currently occupied by a one and one-half single detached heritage dwelling and metal clad garage and metal clad shed. As part of the overall redevelopment, all existing buildings on the site (with exception to the heritage dwelling) would be demolished and a new mixed-use development would be constructed. The application proposes constructing an eleven (11) storey building with 39 residential units and 1,210 square feet of ground floor commercial.

Access to the site is proposed through an existing driveway to Pine Street as shown in the concept plan; located approximately 55 metres west of the Pine Street and Martha Street intersection (centerline to centerline). The concept plan is provided for context – a more detailed site plan will be developed at a later stage.

A total of 48 parking spaces is proposed. Based on our understanding of the site-specific zoning for the site (Exception-472) [1] a parking rate of 1.30 spaces per unit was previously approved without any requirement for visitor spaces. The latest site plan proposal is slightly lower of this requirement by providing 1.23 spaces per unit without any visitor requirements.

Roadway Geometry

The major travel routes and intersections within the study area are described below. **Figure 3 (Attached)** shows the observed existing geometry and traffic control at each study-area intersection.

- Pine Street is an east-west two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.
- Martha Street is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.
- Pearl Street is a north-south two-lane collector roadway that operates under the jurisdiction of the City of Burlington. Within the study area, it has an urban cross-section, on-street parking and sidewalks on both sides. The speed limit is unposted and assumed to be 50 kilometres per hour.

[1] Zoning By-Law 2020 – Part 14 - Exceptions to Zone Designations, Exception 472

Existing Traffic

To assess existing traffic conditions, turning movement counts (TMC's) were obtained for the study area intersections from previously completed studies[2]. Traffic analysis for this assessment is focussed on the weekday AM and PM peak hours as they represent the highest generating hours of the proposed development and area traffic. **Appendix A** contains the count data.

Turning movement counts conducted prior to year 2019 have been factored with the use of a 1.0 percent per annum growth rate to reflect 2019 Base Year conditions.

The traffic data collected for this project was obtained during the months of February and July. To quantify the seasonal variation of summer traffic volumes in the area, Paradigm has on file summer traffic data and fall traffic data at Lakeshore Road and Pearl Street. **Table 1** provides the comparison.

TABLE 1: SEASONAL COMPARISON

Intersection	Peak Hour	Total Intersection Traffic Volume		
		2017 Summer Count	2018 Fall Count	Difference
Lakeshore Road at Pearl Street	AM	1,339	1,516	+ 13.2%
	PM	1,556	1,570	+ 0.9%

Comparison of the volumes indicates that the weekday AM peak hour volumes are 13% higher during Fall than Summer. During the weekday PM peak hour, no significant seasonal fluctuation occurs. To present a conservative analysis, traffic data collected during the summer month for the weekday AM peak hour were increased by 15 percent to reflect non-summer month conditions. No seasonal variation has been applied to the weekday PM peak hour volumes.

As no major intersections or access points are provided between Martha Street and Pearl Street along Pine Street, volume balancing has been applied to the traffic volumes to ensure reasonable upstream and downstream flow was maintained. The Martha Street and Pine Street intersection was utilized as the reference intersection for "balancing" as turning movement counts were collected during the winter months without and seasonal adjustments applied.

Figure 4 (Attached) illustrates the base year traffic volumes with adjustments incorporated as described herein.

[2] Martha-James Transportation Impact Study, Mattamy Homes, BA Group, November 2017; 2069 Lakeshore Road Transportation Impact Study, Parking Study and TDM Option Report, Paradigm, August 2018.

Trip Generation

Trip generation information is used to forecast the anticipated level of traffic activity as a result of the development. Trip generation for each land use type were summed to establish total site trip generation for the respective AM and PM peak hours.

The rate at which any development generates traffic is dependent upon a number of factors such as size, location and concentration of surrounding developments. To estimate the volume of traffic generated by the development, traffic projections were based on trip generation data published in ITE's Trip Generation, 10th Edition[3]. The following land uses (LUC) have been utilized:

- 222 – Multi-Family Housing (High-Rise); and
- 820 – Shopping Centre.

Data for the peak hour of adjacent street traffic were used to estimate trip generation. Fitted curve equations with satisfactory R^2 values and independent variables were applied. If no equations were provided or satisfactory R^2 values and independent variables were unavailable, the average rates have been applied.

It is recognized that transit, cyclist and pedestrian facilities that surround the subject site will likely result in some residential trips being made by bike or on foot. This causes a reduction in the overall trip generation estimates. Based on previous development applications completed for the study area[4], a modal split rate of 20% has been previously utilized and accepted by the City of Burlington.

Table 2 summarizes the projected trip generation associated with the build-out of the development. These estimates were based on the standardized ITE rates with modal split credits made as noted earlier.

As shown, with build-out of the development approximately 20 net new trips during the weekday AM peak hour and 22 during the weekday PM peak hour are forecast to be added to the area roadways. With the net new forecast volume of traffic traveling within the study area being determined, these new trips can be assigned to the surrounding roadway network as described in the following sections.

[3] Trip Generation Tenth Edition, Institute of Transportation Engineers, Washington D.C., 2017
[4] 421-431 Brant Street Transportation Impact Study, Parking Study and TDM Option Report, Paradigm, December 2016

TABLE 2: TRIP GENERATION ESTIMATES

Land Use Code	GFA (sq. ft.)	Units	Trips	AM Peak Hour				PM Peak Hour			
				Rate	In	Out	Total	Rate	In	Out	Total
222 - Multi-Family Housing High Rise (Units)	-	39	Total	Eqn.	6	18	**24**	Eqn.	13	9	**22**
			Modal Split	20%	1	4	**5**	20%	3	2	**5**
			New	80%	5	14	**19**	80%	10	7	**17**
820 - Shopping Centre (GFA)	1,210	-	Total	0.94	1	0	**1**	3.81	2	3	**5**
			New	100%	1	0	**1**	100%	2	3	**5**
Total Trip Generation			**Total**		7	18	25		15	12	27
			Modal Split		1	4	5		3	2	5
			New		6	14	20		12	10	22

The trip distribution for the site was developed based on the 2016 Transportation Tomorrow Survey (TTS) [5]. For the Burlington Zone, the trip distribution was further refined based on the existing link volumes at the external limits of the study area. The trip distribution calculations are included in **Appendix B**. **Table 3** summarizes the estimated trip distribution for the development.

TABLE 3: TRIP DISTRIBUTION ESTIMATES

Direction (to/from)	Travel Route	Distribution
North	Martha Street	5%
North	Pearl Street	10%
South	Martha Street	40%
South	Pearl Street	30%
West	Pine Street	15%
Total		**100%**

5 Transportation Tomorrow Survey (TTS), 2016, Summary by Wards, Data Management Group, University of Toronto.

Accordingly, the site generated trips were assigned to the road network-based on the distribution of traffic during the peak hours. **Figure 5 (Attached)** shows the resulting trip assignment for the peak hours respectively.

Future Traffic Forecasts

A horizon year of (2024) was chosen representing five years beyond the date of the study. Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. A frequently used procedure is to estimate an annual percentage increase and apply that increase to the study area roadway traffic volumes. An alternative procedure is to identify estimated traffic generated by specific planned major developments that would be expected to affect the study area roadways.

For the purpose of this assessment, both methods were utilized. Generalized traffic growth was determined by applying a growth rate of 1.0% per annum to the base year volumes. In addition to general growth, it is possible that there will be other new developments in the area that will also increase the traffic volumes along the area roadways. It is understood that a number of approved and in-stream developments are proposed:

- 501-515 John Street, 2080 Caroline Street; 500 Elizabeth Street; and 2027 Maria Street
- 2042 – 2054 Lakeshore Road;
- 374 Martha Street
- 452 Locus Street;
- 616 Brant Street;
- 421 - 431 Brant Street;
- 409 Brant Street;
- 2069 Lakeshore Road;
- 2082, 2086, and 2090 James Street; and
- 401 – 417 Martha Street;

Projections for these developments has been previously forecasted in the 401 – 417 Martha Street Transportation Impact Study[6]. **Figure 6 (Attached)** shows the 2024 background traffic forecasts.

The total traffic volumes were calculated by taking the site-generated traffic and adding it to the background traffic volumes. **Figure 7 (Attached)** shows the 2024 total traffic forecasts.

[6] 180155 401-417 Martha Street TIS PS and TDM Options Report, Paradigm, January 2019

Traffic Analyses

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic within the study area. To assess quality of flow, roadway capacity analysis was conducted with respect to 2019 existing traffic conditions and projected 2024 Background and Total traffic conditions. Intersection capacity analyses were performed for the study area intersections using Synchro.

Level of service is the term that defines the conditions that may occur on a given roadway or at an intersection when accommodating various traffic volume loads and were calculated based on the criteria published in the 2000 Highway Capacity Manual[7]. Levels of service range from A to F with LOS A representing the best vehicular operating conditions and LOS F representing the most congested. For unsignalized intersections, the analysis assumes that traffic on the main street is not affected by traffic on the side streets. The level of service is only determined for left turns from the main street and all movements from the minor street.

Table 4 summarize the capacity analyses for the study area intersections, respectively. The capacity analyses results are included in **Appendix C**. The following is noted:

- Under existing conditions, the study area intersections operate at LOS 'A', indicating that there are low delays at these intersections. No operational issues are noted from the results of the traffic analysis.
- Future background traffic conditions remain largely unchanged from the existing traffic conditions, with delays increasing by a very small amount. As a result, the future background scenario is expected to continue to operate well during both peak hours.
- The addition of the site generated traffic has resulted in very marginal impacts on the study area network. All of the intersections are expected to operate at virtually the same level of service compared to future background conditions. The development can be readily accommodated by the existing road network with no improvements necessary.

[7] Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

TABLE 4: OPERATIONAL ANALYSES

Analysis Period	Intersection	Control Type	Horizon	MOE	Direction / Movement / Approach														Overall
					Eastbound				Westbound				Northbound				Southbound		
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Martha Street at Pine Street	TWSC	Base Year	LOS	A		A	A					A	A		A		A	A	A	4
				Delay	9		9	9					1	1		1		0	0	0	
				V/C	0.05		0.05						0.01	0.01				0.01	0.01		
				Q	1		1						0	0				0	0		
		TWSC	2024 Background	LOS	A		A	A					A	A		A		A	A	A	3
				Delay	10		10	10					1	1		1		0	0	0	
				V/C	0.07		0.07						0.01	0.01				0.04	0.04		
				Q	2		2						0	0				0	0		
		TWSC	2024 Total	LOS	A		A	A					A	A		A		A	A	A	3
				Delay	10		10	10					1	1		1		0	0	0	
				V/C	0.07		0.07						0.01	0.01				0.04	0.04		
				Q	2		2						0	0				0	0		
	2 - Pearl Street at Pine Street	TWSC	Base Year	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	8
				Delay	8	8	8	8	7	7	7	7	8	8	8	8	8	8	8	8	
				DU	0.05	0.05	0.05		0.02	0.02	0.02		0.13	0.13	0.13		0.11	0.11	0.11		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
		TWSC	2024 Background	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	8
				Delay	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
				DU	0.06	0.06	0.06		0.03	0.03	0.03		0.15	0.15	0.15		0.13	0.13	0.13		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
		TWSC	2024 Total	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	8
				Delay	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
				DU	0.06	0.06	0.06		0.04	0.04	0.04		0.15	0.15	0.15		0.13	0.13	0.13		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
	3 - Pine Street at Driveway	TWSC	2024 Total	LOS	A	A		A		A	A	A					A		A	A	2
				Delay	1	1		1		0	0	0					9		9	9	
				V/C	0.00	0.00				0.02	0.02						0.02		0.02		
				Q	0	0				0	0						0		0		
PM Peak Hour	1 - Martha Street at Pine Street	TWSC	Base Year	LOS	A		A	A					A	A		A		A	A	A	5
				Delay	10		10	10					2	2		2		0	0	0	
				V/C	0.11		0.11						0.02	0.02				0.02	0.02		
				Q	3		3						0	0				0	0		
		TWSC	2024 Background	LOS	A		A	A					A	A		A		A	A	A	5
				Delay	10		10	10					2	2		2		0	0	0	
				V/C	0.15		0.15						0.02	0.02				0.03	0.03		
				Q	4		4						0	0				0	0		
		TWSC	2024 Total	LOS	A		A	A					A	A		A		A	A	A	5
				Delay	10		10	10					2	2		2		0	0	0	
				V/C	0.16		0.16						0.02	0.02				0.03	0.03		
				Q	4		4						1	1				0	0		
	2 - Pearl Street at Pine Street	TWSC	Base Year	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	9
				Delay	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	
				DU	0.10	0.10	0.10		0.05	0.05	0.05		0.17	0.17	0.17		0.26	0.26	0.26		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
		TWSC	2024 Background	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	9
				Delay	9	9	9	9	8	8	8	8	9	9	9	9	10	10	10	10	
				DU	0.13	0.13	0.13		0.06	0.06	0.06		0.20	0.20	0.20		0.31	0.31	0.31		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
		TWSC	2024 Total	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	9
				Delay	9	9	9	9	8	8	8	8	9	9	9	9	10	10	10	10	
				DU	0.13	0.13	0.13		0.08	0.08	0.08		0.20	0.20	0.20		0.32	0.32	0.32		
				Q	-	-	-		-	-	-		-	-	-		-	-	-		
	3 - Pine Street at Driveway	TWSC	2024 Total	LOS	A	A		A		A	A	A				A	A		A	A	1
				Delay	1	1		1		0	0	0				9	9		9	9	
				V/C	0.01	0.01				0.03	0.03						0.01		0.01		
				Q	0	0				0	0						0		0		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Lengt
Ex. - Existing Available Storage
Avail. - Available Storage
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control
DU - Degree Utilizatio

Left-Turn Lane Analyses

The unsignalized intersections within the study area that have increases in left-turning traffic as a result of the development traffic were assessed to determine if the future traffic volumes warrant installation of a left turn lane along the major roadway.

The warrants for left-turn lanes follow the requirements in the Ministry of Transportation's (MTO) Geometric Design Standards[8]. A design speed of 10 kilometres per hour over the posted and/or assumed speed limit has been utilized. **Table 5** summarizes the results of the left-turn lane warrant analyses. The following is noted:

- A northbound left turn lane along Martha Street at Pine Street is not warranted under the 2024 Total conditions.
- An eastbound left turn lane along Pine Street at the Driveway is not warranted under the 2024 Total conditions.

TABLE 5: LEFT TURN LANE WARRANT ANALYSES

Martha Street at Pine Street - 2024 Total		
Approach Direction Design Speed	Northbound 60 km/h	
Peak Hour	AM	PM
Advancing Volume	93	133
Opposing Volumes	58	52
Left Turning Traffic	15	28
% of Left Turning Traffic	16.1%	21.1%
Figure Used*	9A-7	9A-8
Warranted	**No**	**No**
Storage Length Required	n/a	n/a
Pine Street at Driveawy - 2024 Total		
Approach Direction Design Speed	Eastbound 60 km/h	
Peak Hour	AM	PM
Advancing Volume	55	119
Opposing Volumes	25	48
Left Turning Traffic	4	7
% of Left Turning Traffic	7.3%	5.9%
Figure Used*	9A-6	9A-6
Warranted	**No**	**No**
Storage Length Required	n/a	n/a

Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Road - June 2017

[8] Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Road - June 2017

Parking Supply

A total of 48 parking spaces is proposed. Based on our understanding of the site-specific zoning for the site (Exception-472) [9] a parking rate of 1.30 spaces per unit was previously approved without any requirement for visitor spaces. The latest site plan proposal is slightly lower of this requirement by providing 1.23 spaces per unit without any visitor requirements.

The subject site is within 300 metres, or less than a 5-minute walk, of the Downtown Transit terminal and bus routes on Lakeshore Road and New Street and is well serviced by existing transit routes. A review of vehicle ownership provided by the 2016 Transportation Tomorrow Survey (TTS) for Ward 2 suggests that approximately 9 percent of apartment dwellings surveyed do not own a vehicle. Further disposition of the survey results can conclude that the actual vehicle ownership, based on a weighted average is 1.22 vehicles per unit. **Table 6** summarizes the TTS data.

TABLE 6: VEHICLE OWNERSHIP RATES (WARD 2)

Vehicles Per Household				Households	Vehicles	Ownership
0	1	2	3			
1,850	12,840	6,102	209			
0	12840	12204	627	21,001	25,671	1.22
9%	*61%*	*29%*	*1%*			

Applying the 2016 vehicle ownership data set to the proposed development program, the potential parking supply for the residential component is projected at 48 spaces; meeting the proposed supply. The proposed parking ratio of 1.23 spaces per unit is noted to be sufficient as no residential overspill is projected.

As stated previously, no on-site visitor parking supply is proposed. The Official Plan[10] sets out that the City may consider the use of reduced parking standards in Mixed Use Activity Areas in order to encourage greater reliance on non-automobile forms of transportation. As there is on street parking on Pine Street and a number of City parking lots in the immediate vicinity of the site (including a lot immediately adjacent to the north), the reduction in visitor parking is not anticipated to have an impact on the surrounding neighbourhood.

With the limited visitor parking supply proposed, the development promotes the use of other modes of transportation and plays a significant role in setting an example for visitors to consider non-automotive travel. This points to the importance of ongoing parking management and demand reduction strategies for these areas to ensure that an oversupply of parking is not provided that could hinder the ability to attract a significant portion of the population to transit mode choice. In the event that visitors of the development are unwilling to utilize sustainable

[9] Zoning By-Law 2020 – Part 14 - Exceptions to Zone Designations, Exception 472
[10] Burlington Official Plan, Last Update (July 2015).

modes, as stated previously, a number of City parking lots and adjacent on-street spaces are available within the study area.

Conclusion

The application proposes constructing an eleven (11) storey building with 39 residential units and 1,210 square feet of ground floor commercial. Access to the site is proposed through an existing driveway to Pine Street. This Transportation Impact Brief presents details of the existing roadway conditions on Pine Street and the anticipated trip generation from build-out of the proposed development; 2085 Pine Street.

Full-built out of the development is projected to generate approximately 20 to 22 new vehicle trips during the weekday peak hours. Detailed traffic analysis was conducted for each of the study area intersections under Existing Conditions and 2024 Background and Total traffic conditions. The capacity analysis showed that the study area intersections are not expected to experience significant impacts to operations as a result of the proposed development.

Overall, the boundary road network provides sufficient reserve capacity to accommodate the proposed development and approved in-stream development applications. The analyses indicates that off-site traffic improvement would not be required to support the Application.

Under the site-specific zoning for the site (Exception-472), the proposed development requires 1.30 spaces per unit without any visitor requirements. The latest site plan proposal is slightly lower of this requirement by providing 1.23 spaces per unit without any visitor requirements. To validate that the proposed reduction is supportable, a review of vehicle ownership provided by the 2016 TTS dataset for apartment units in Ward 2 suggests a vehicle ownership rate of 1.22 vehicles per unit. The proposed parking supply for the proposed development is noted to be adequate with no residential overspill projected.

As stated previously, no on-site visitor parking supply is proposed. As there is on-street parking on Pine Street and a number of City parking lots in the immediate vicinity of the site (including a lot immediately adjacent to the north), the reduction in visitor parking is not anticipated to have an impact on the surrounding neighbourhood. As the primary purpose of off-site public parking facilities is to provide short-stay parking for visitors to the area, the use of these spaces for visitors of the development will not have a negative impact on the surrounding neighborhood.

We trust that the foregoing information will meet your requirements. Please do not hesitate to contact us if we can be of further assistance.

Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



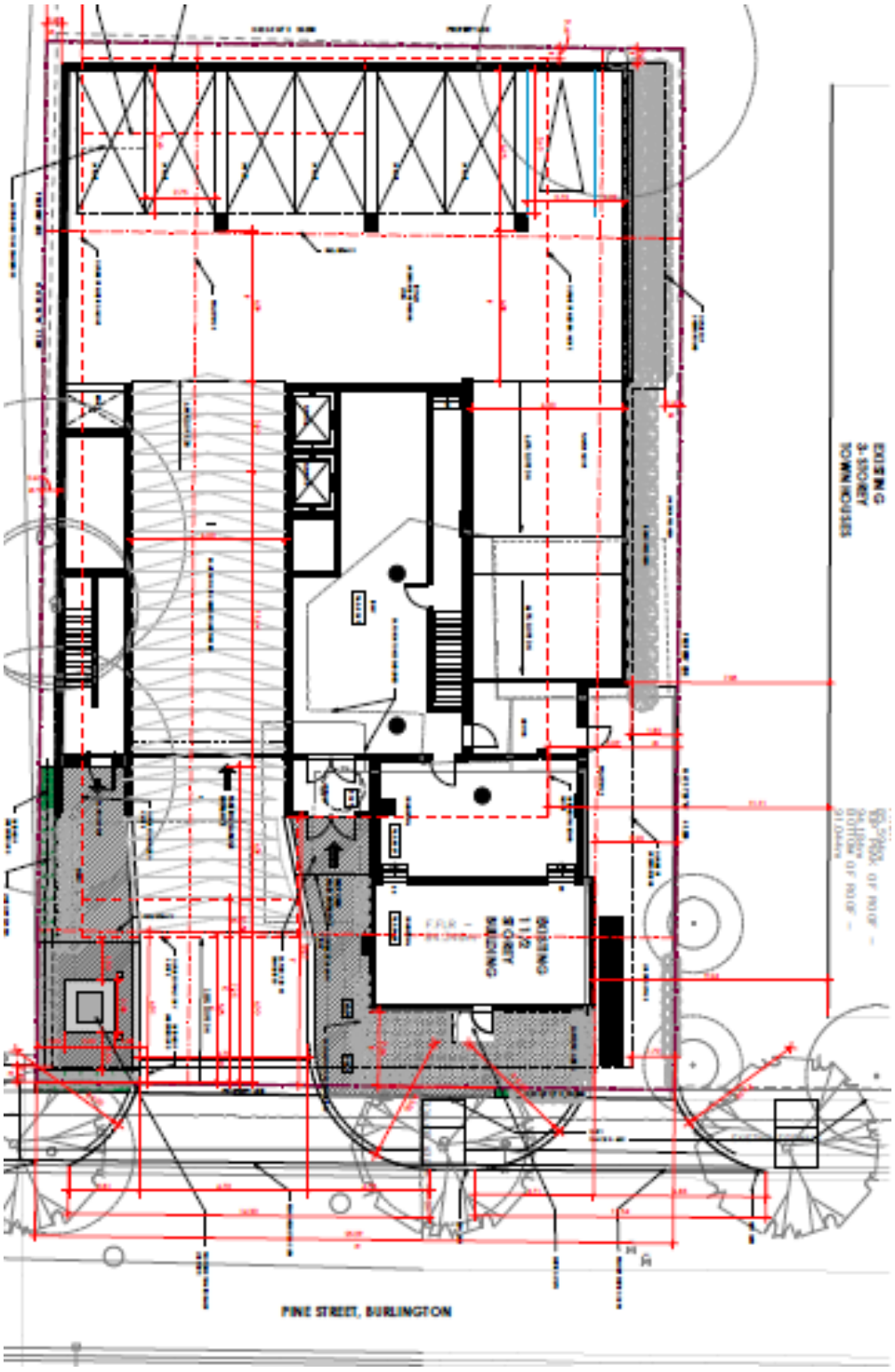
Adam J. Makarewicz
Dipl.T., C.E.T. MITE
Senior Project Manager



Stew Elkins
B.E.S., MITE
Vice President

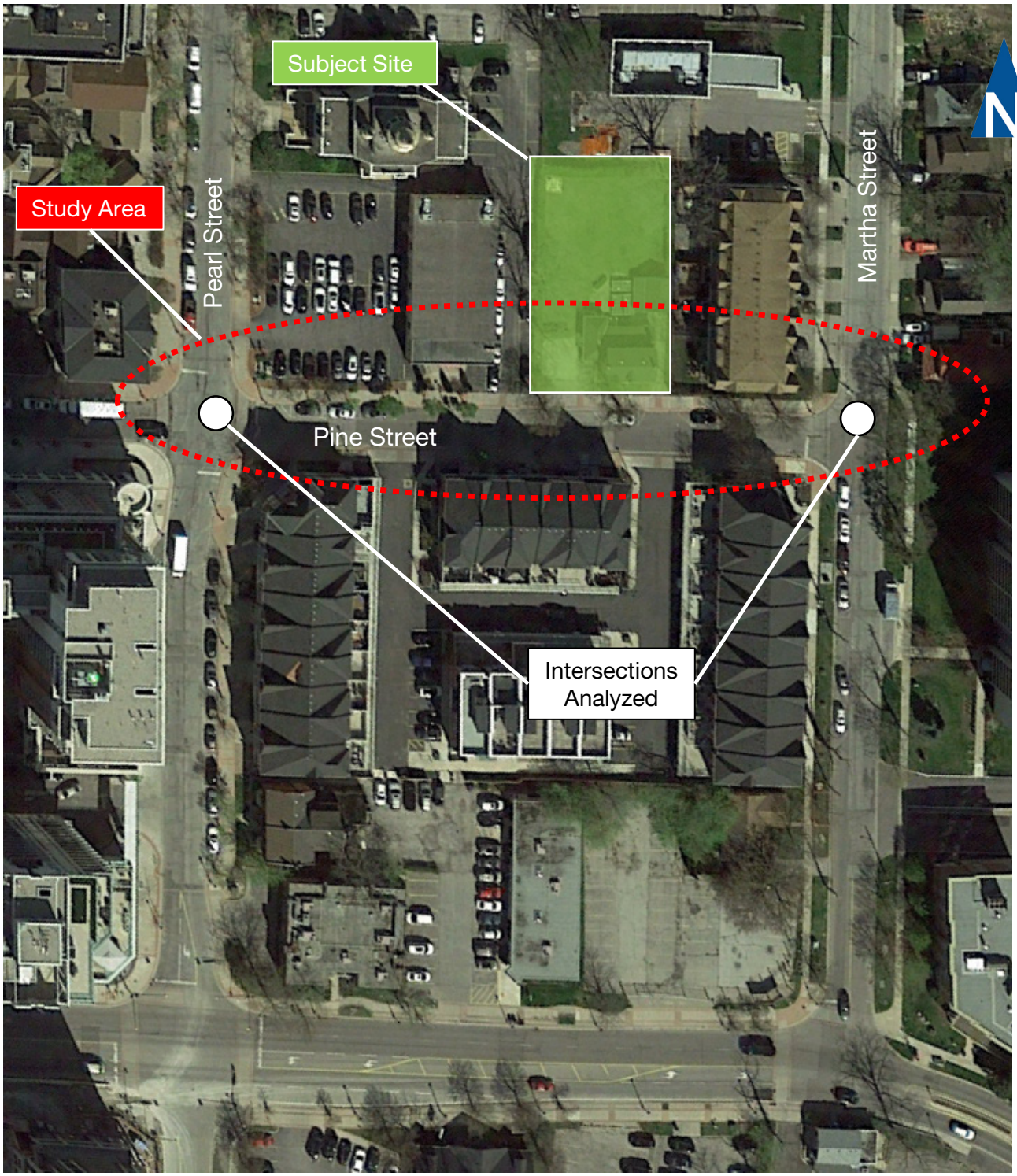
ATTACHMENTS





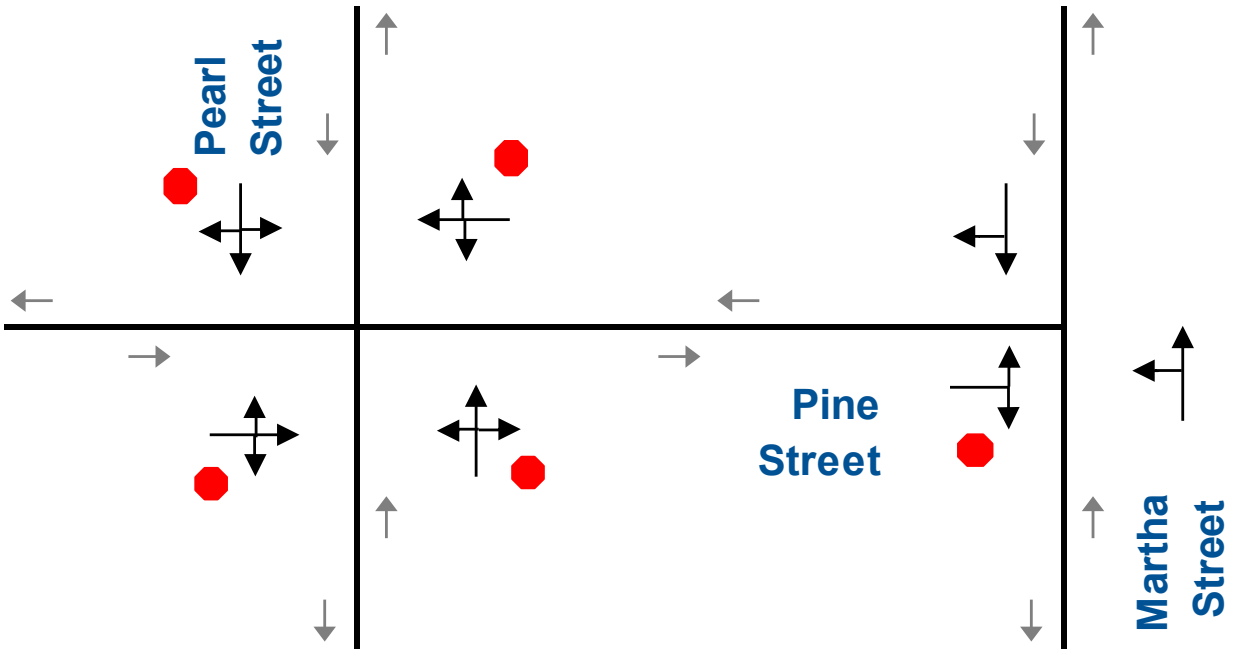
paradigm
TRANSPORTATION SOLUTIONS LIMITED

Concept Plan



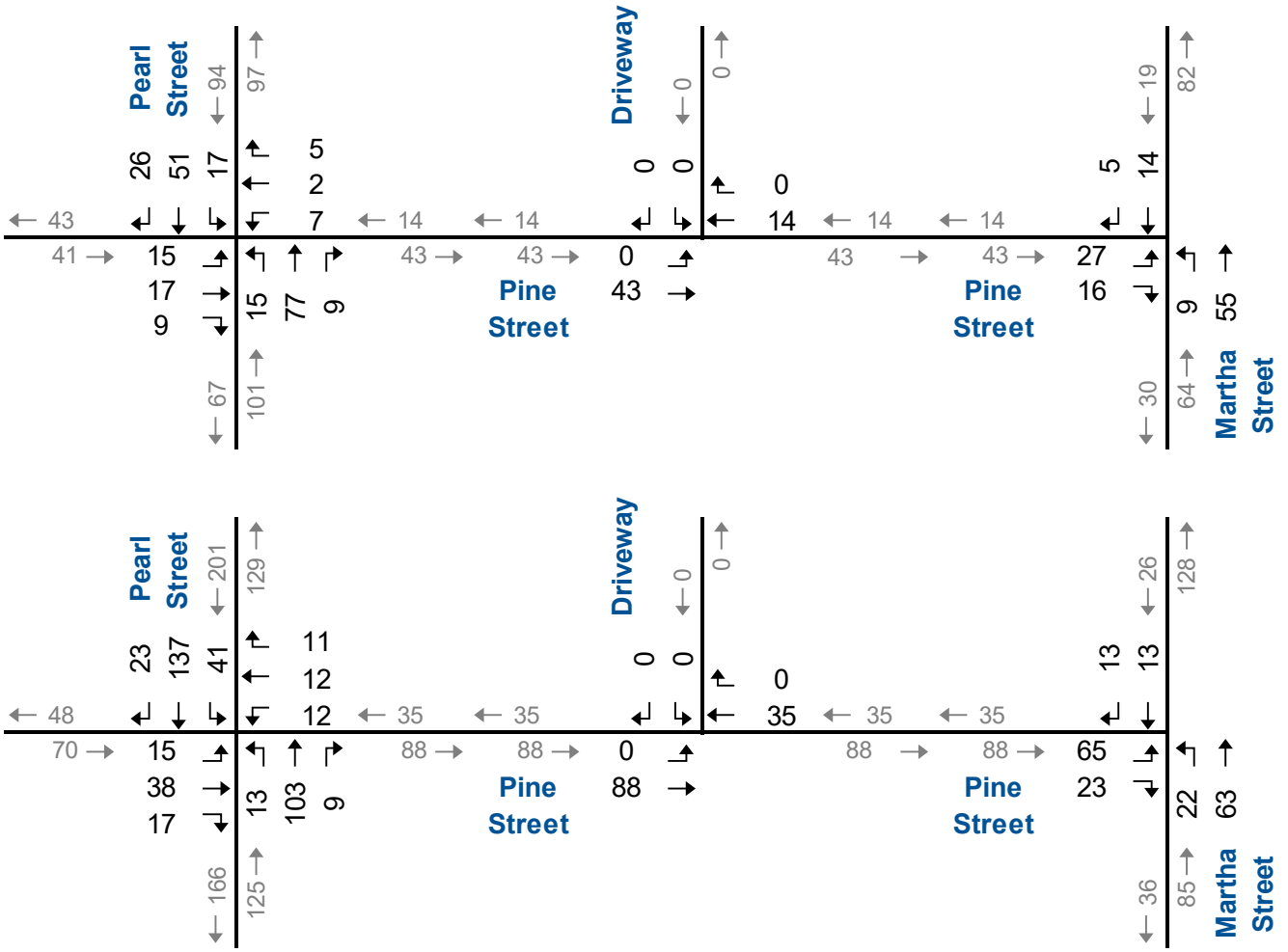
Source: Google Earth

Study Area and Subject Development Location

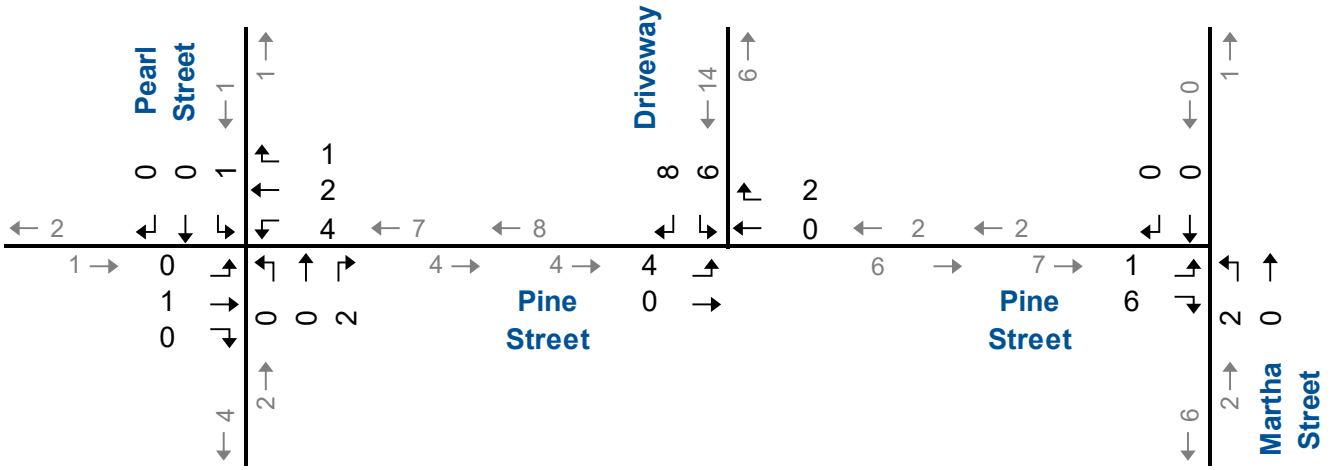


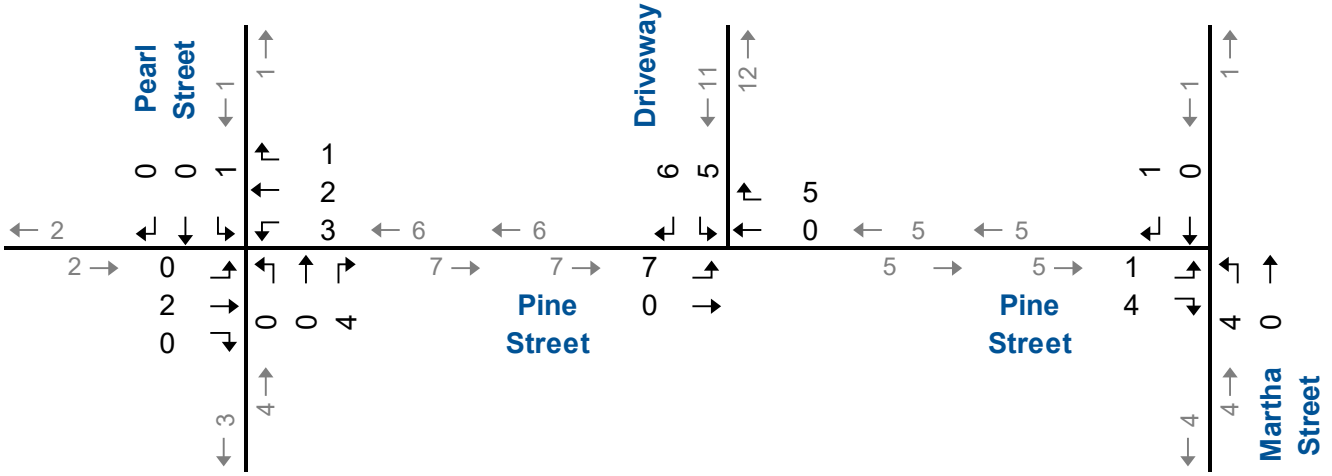
Existing Lane Configuration

Figure 3


Pearl Street
Pine Street
Driveway
Pine Street
Martha Street
Weekday
PM Peak Hour

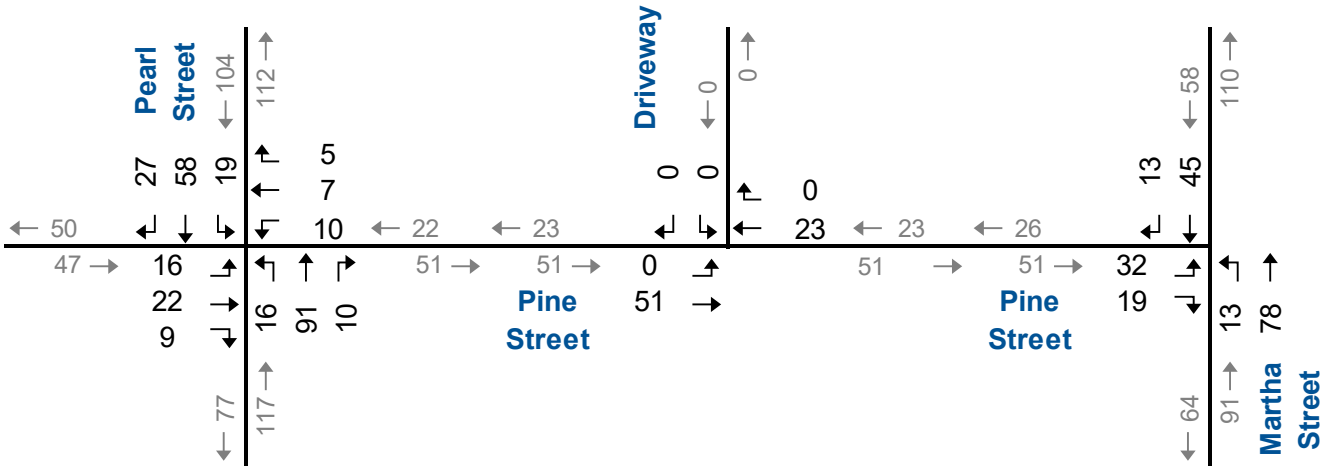
Weekday
AM Peak Hour

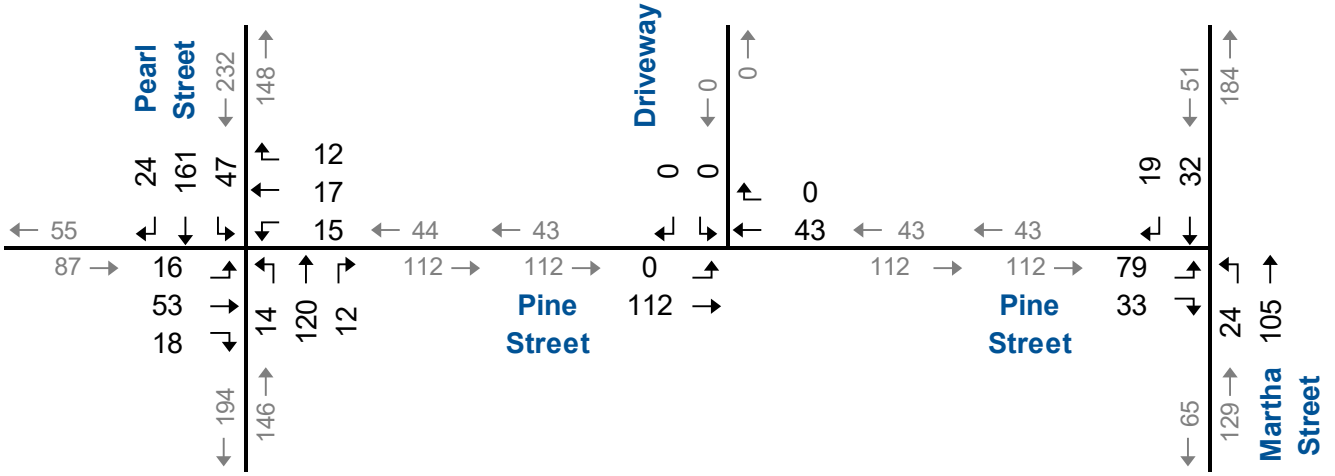




Weekday
PM Peak Hour

Weekday
AM Peak Hour





Weekday
PM Peak Hour

APPENDIX A

TRAFFIC DATA



Peak Hour: 04:15 PM - 05:15 PM Weather: Unknown (-0.3 °C)

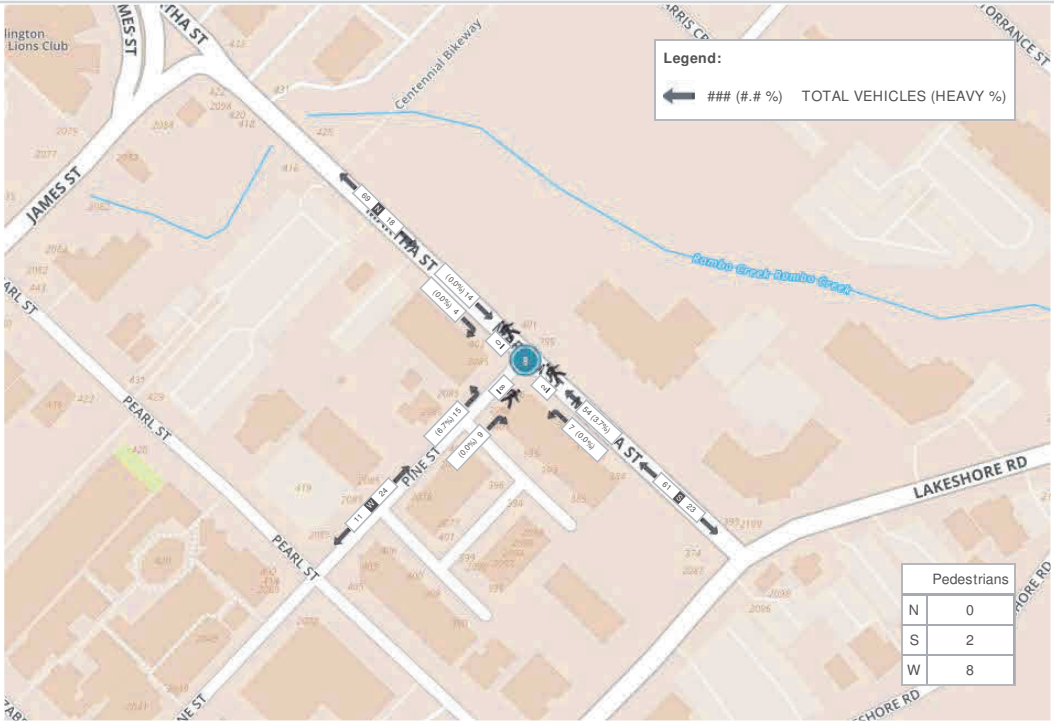
Start Time	N Approach MARTHA ST					S Approach MARTHA ST					W Approach PINE ST					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
16:15:00	4	4	0	0	8	9	1	0	2	10	3	10	0	4	13	31
16:30:00	2	1	0	0	3	15	6	0	3	21	0	4	0	0	4	28
16:45:00	2	2	0	0	4	15	8	0	1	23	5	13	1	1	19	46
17:00:00	1	6	0	0	7	23	2	0	3	25	5	9	0	0	14	46
Grand Total	9	13	0	0	22	62	17	0	9	79	13	36	1	5	50	**151**
Approach%	40.9%	59.1%	0%		-	78.5%	21.5%	0%		-	26%	72%	2%		-	-
Totals %	6%	8.6%	0%		14.6%	41.1%	11.3%	0%		52.3%	8.6%	23.8%	0.7%		33.1%	-
PHF	0.56	0.54	0		0.69	0.67	0.53	0		0.79	0.65	0.69	0.25		0.66	-
Heavy	0	0	0		0	1	0	0		1	0	0	0		0	-
Heavy %	0%	0%	0%		0%	1.6%	0%	0%		1.3%	0%	0%	0%		0%	-
Lights	9	13	0		22	61	17	0		78	13	36	1		50	-
Lights %	100%	100%	0%		100%	98.4%	100%	0%		98.7%	100%	100%	100%		100%	-
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Buses	0	0	0		0	1	0	0		1	0	0	0		0	-
Buses %	0%	0%	0%		0%	1.6%	0%	0%		1.3%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	0	-	-	-	-	9	-	-	-	-	5	-	-
Pedestrians%	-	-	-	0%		-	-	-	64.3%		-	-	-	35.7%		-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	1	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

Spectrum

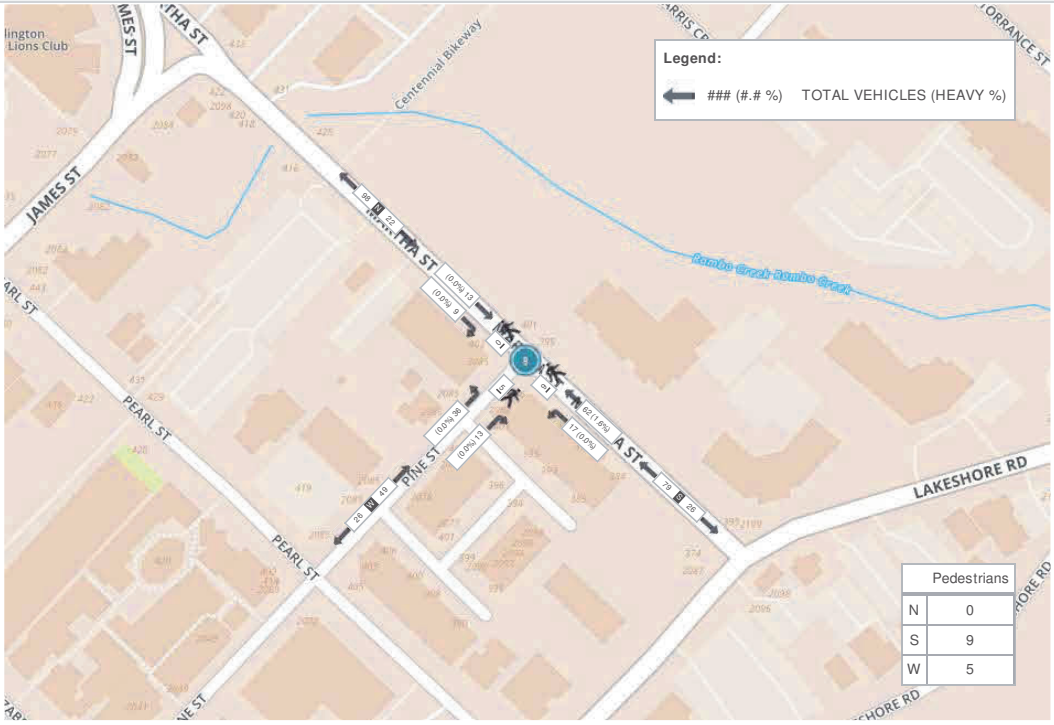
Turning Movement Count
Location Name: PINE ST & MARTHA ST
Date: Wed, Feb 08, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 08:00 AM - 09:00 AM Weather: Unknown (0.3 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Unknown (-0.3 °C)



Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Pine Street
Site Code:
Start Date: 07/18/2017

Turning Movement Data

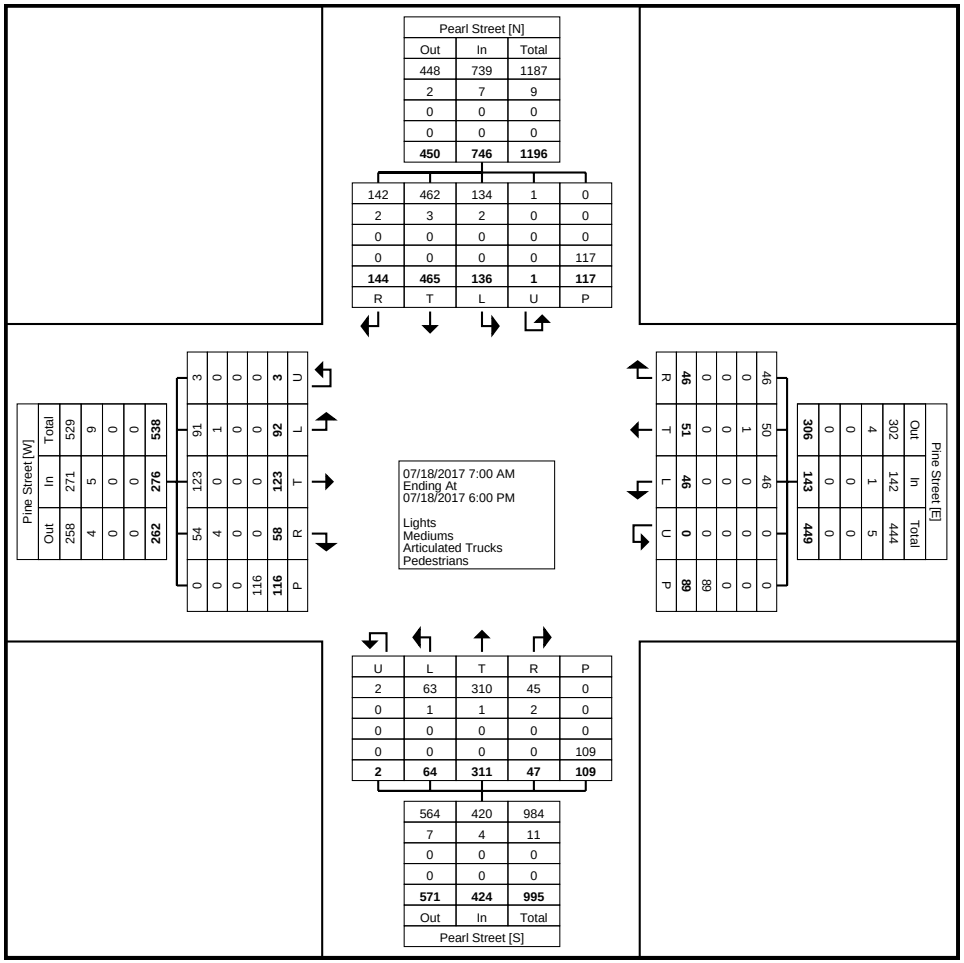
Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	5	0	0	0	6	1	2	1	0	1	4	0	1	0	0	0	1	1	8	2	0	1	11	22
7:15 AM	2	1	1	0	2	4	1	2	1	0	1	4	1	1	0	0	3	2	0	6	3	0	0	9	19
7:30 AM	1	1	1	0	3	3	2	1	0	0	2	3	4	7	0	0	1	11	3	8	2	0	0	13	30
7:45 AM	5	3	1	0	0	9	1	0	2	0	1	3	2	10	0	0	1	12	2	4	1	0	1	7	31
Hourly Total	9	10	3	0	5	22	5	5	4	0	5	14	7	19	0	0	5	26	6	26	8	0	2	40	102
8:00 AM	3	5	2	0	4	10	1	1	1	0	5	3	1	6	1	0	3	8	2	9	1	0	5	12	33
8:15 AM	1	2	3	0	3	6	1	1	1	0	6	3	2	10	1	0	2	13	5	7	1	0	5	13	35
8:30 AM	8	5	0	1	5	14	0	2	2	0	1	4	4	5	3	1	1	13	4	15	5	0	2	24	55
8:45 AM	4	8	1	0	5	13	1	3	0	0	4	4	3	12	2	0	3	17	4	11	4	0	3	19	53
Hourly Total	16	20	6	1	17	43	3	7	4	0	16	14	10	33	7	1	9	51	15	42	11	0	15	68	176
9:00 AM	4	4	2	0	5	10	0	0	0	0	1	0	4	12	1	0	2	17	4	11	3	0	2	18	45
9:15 AM	1	5	2	0	3	8	2	1	2	0	3	5	1	19	2	0	6	22	2	8	5	0	2	15	50
9:30 AM	5	4	2	0	4	11	3	1	1	0	3	5	5	19	2	0	3	26	2	11	5	0	2	18	60
9:45 AM	3	2	2	0	7	7	1	0	1	0	3	2	3	16	3	0	10	22	7	13	10	0	8	30	61
Hourly Total	13	15	8	0	19	36	6	2	4	0	10	12	13	66	8	0	21	87	15	43	23	0	14	81	216
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	6	3	4	0	3	13	2	4	2	0	0	8	0	14	3	0	7	17	5	27	5	0	2	37	75
3:15 PM	3	4	4	0	4	11	4	3	2	0	6	9	3	13	6	0	3	22	6	26	17	0	8	49	91
3:30 PM	6	3	3	2	9	14	3	3	2	0	6	8	2	8	5	0	6	15	6	28	6	1	6	41	78
3:45 PM	5	10	4	0	16	19	3	3	3	0	4	9	3	19	2	0	18	24	13	41	7	0	5	61	113
Hourly Total	20	20	15	2	32	57	12	13	9	0	16	34	8	54	16	0	34	78	30	122	35	1	21	188	357
4:00 PM	3	11	4	0	4	18	2	4	5	0	3	11	3	24	2	0	7	29	15	34	4	0	7	53	111
4:15 PM	4	7	6	0	4	17	2	3	3	0	4	8	3	34	3	1	10	41	7	29	4	0	4	40	106
4:30 PM	3	9	3	0	2	15	5	2	0	0	1	7	4	24	2	0	1	30	5	30	8	0	3	43	95
4:45 PM	5	5	4	0	7	14	2	3	3	0	9	8	3	18	1	0	5	22	7	34	11	0	11	52	96
Hourly Total	15	32	17	0	17	64	11	12	11	0	17	34	13	100	8	1	23	122	34	127	27	0	25	188	408
5:00 PM	3	2	2	0	4	7	1	3	4	0	3	8	3	11	1	0	6	15	4	31	5	0	7	40	70
5:15 PM	4	9	2	0	9	15	1	3	1	0	14	5	4	10	3	0	4	17	10	29	11	0	13	50	87
5:30 PM	4	10	3	0	6	17	1	3	1	0	5	5	5	10	2	0	6	17	11	22	12	0	10	45	84
5:45 PM	8	5	2	0	7	15	6	3	8	0	3	17	1	8	2	0	1	11	11	23	12	0	10	46	89
Hourly Total	19	26	9	0	26	54	9	12	14	0	25	35	13	39	8	0	17	60	36	105	40	0	40	181	330
Grand Total	92	123	58	3	116	276	46	51	46	0	89	143	64	311	47	2	109	424	136	465	144	1	117	746	1589
Approach %	33.3	44.6	21.0	1.1	-	-	32.2	35.7	32.2	0.0	-	-	15.1	73.3	11.1	0.5	-	-	18.2	62.3	19.3	0.1	-	-	-
Total %	5.8	7.7	3.7	0.2	-	17.4	2.9	3.2	2.9	0.0	-	9.0	4.0	19.6	3.0	0.1	-	26.7	8.6	29.3	9.1	0.1	-	46.9	-
Lights	91	123	54	3	-	271	46	50	46	0	-	142	63	310	45	2	-	420	134	462	142	1	-	739	1572
% Lights	98.9	100.0	93.1	100.0	-	98.2	100.0	98.0	100.0	-	-	99.3	98.4	99.7	95.7	100.0	-	99.1	98.5	99.4	98.6	100.0	-	99.1	98.9
Mediums	1	0	4	0	-	5	0	1	0	0	-	1	1	1	2	0	-	4	2	3	2	0	-	7	17

% Mediums	1.1	0.0	6.9	0.0	-	1.8	0.0	2.0	0.0	-	-	0.7	1.6	0.3	4.3	0.0	-	0.9	1.5	0.6	1.4	0.0	-	0.9	1.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	116	-	-	-	-	-	89	-	-	-	-	-	109	-	-	-	-	-	117	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Pine Street
Site Code:
Start Date: 07/18/2017



Turning Movement Data Plot

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Count Name: Pearl Street & Pine Street
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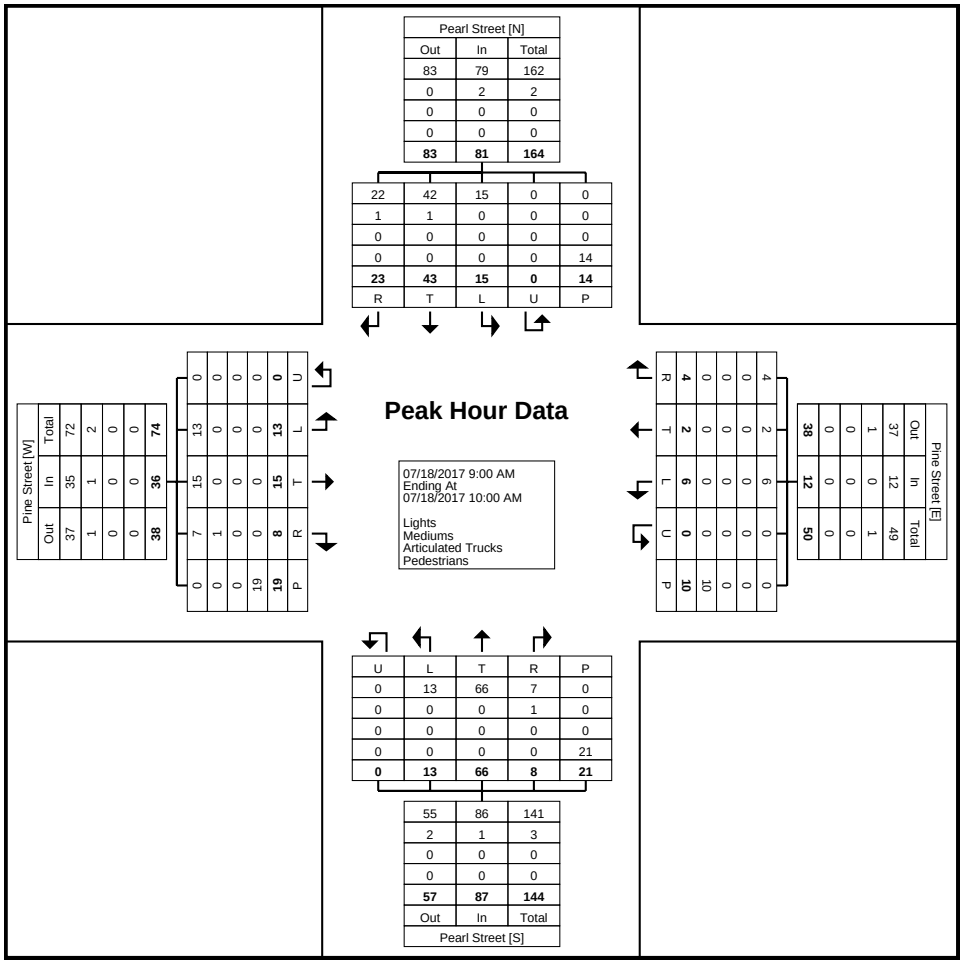
Turning Movement Peak Hour Data (9:00 AM)

Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
9:00 AM	4	4	2	0	5	10	0	0	0	0	1	0	4	12	1	0	2	17	4	11	3	0	2	18	45
9:15 AM	1	5	2	0	3	8	2	1	2	0	3	5	1	19	2	0	6	22	2	8	5	0	2	15	50
9:30 AM	5	4	2	0	4	11	3	1	1	0	3	5	5	19	2	0	3	26	2	11	5	0	2	18	60
9:45 AM	3	2	2	0	7	7	1	0	1	0	3	2	3	16	3	0	10	22	7	13	10	0	8	30	61
Total	13	15	8	0	19	36	6	2	4	0	10	12	13	66	8	0	21	87	15	43	23	0	14	81	216
Approach %	36.1	41.7	22.2	0.0	-	-	50.0	16.7	33.3	0.0	-	-	14.9	75.9	9.2	0.0	-	-	18.5	53.1	28.4	0.0	-	-	-
Total %	6.0	6.9	3.7	0.0	-	16.7	2.8	0.9	1.9	0.0	-	5.6	6.0	30.6	3.7	0.0	-	40.3	6.9	19.9	10.6	0.0	-	37.5	-
PHF	0.650	0.750	1.000	0.000	-	0.818	0.500	0.500	0.500	0.000	-	0.600	0.650	0.868	0.667	0.000	-	0.837	0.536	0.827	0.575	0.000	-	0.675	0.885
Lights	13	15	7	0	-	35	6	2	4	0	-	12	13	66	7	0	-	86	15	42	22	0	-	79	212
% Lights	100.0	100.0	87.5	-	-	97.2	100.0	100.0	100.0	-	-	100.0	100.0	100.0	87.5	-	-	98.9	100.0	97.7	95.7	-	-	97.5	98.1
Mediums	0	0	1	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	0	1	1	0	-	2	4
% Mediums	0.0	0.0	12.5	-	-	2.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	12.5	-	-	1.1	0.0	2.3	4.3	-	-	2.5	1.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	19	-	-	-	-	-	10	-	-	-	-	-	21	-	-	-	-	-	14	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Pine Street
Site Code:
Start Date: 07/18/2017



Turning Movement Peak Hour Data Plot (9:00 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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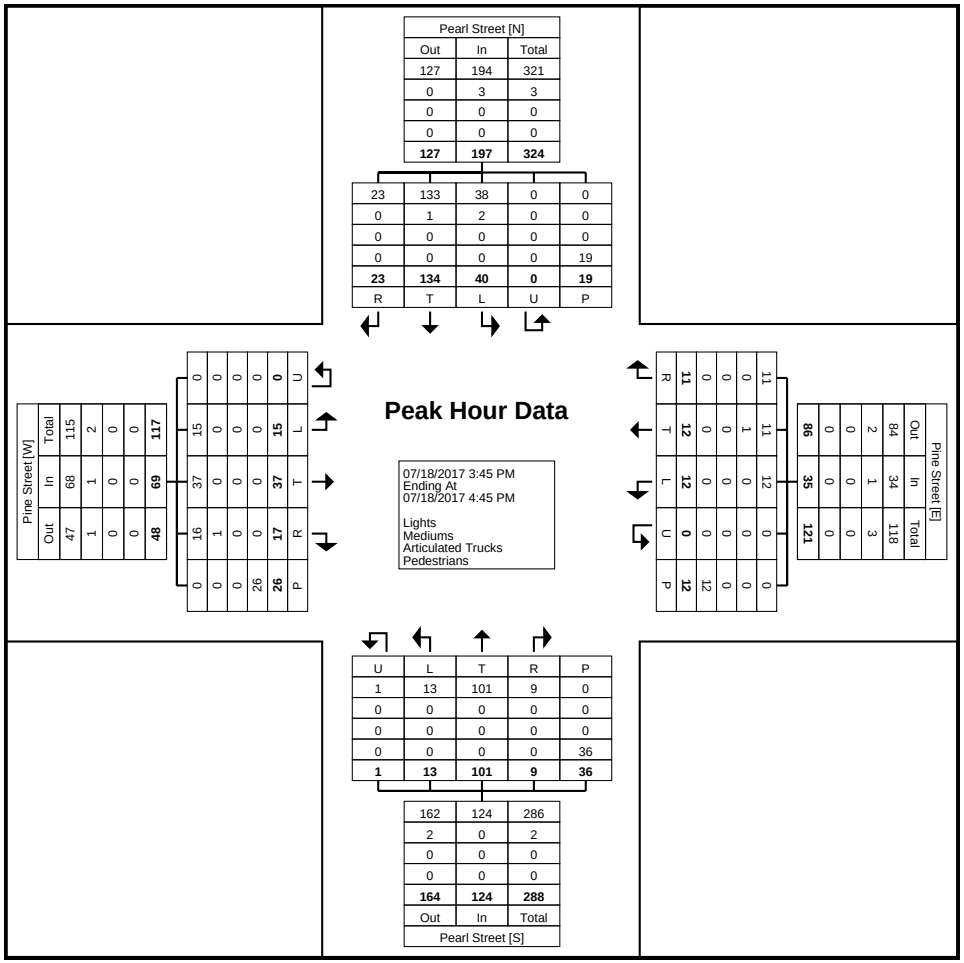
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Pine Street Eastbound						Pine Street Westbound						Pearl Street Northbound						Pearl Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:45 PM	5	10	4	0	16	19	3	3	3	0	4	9	3	19	2	0	18	24	13	41	7	0	5	61	113
4:00 PM	3	11	4	0	4	18	2	4	5	0	3	11	3	24	2	0	7	29	15	34	4	0	7	53	111
4:15 PM	4	7	6	0	4	17	2	3	3	0	4	8	3	34	3	1	10	41	7	29	4	0	4	40	106
4:30 PM	3	9	3	0	2	15	5	2	0	0	1	7	4	24	2	0	1	30	5	30	8	0	3	43	95
Total	15	37	17	0	26	69	12	12	11	0	12	35	13	101	9	1	36	124	40	134	23	0	19	197	425
Approach %	21.7	53.6	24.6	0.0	-	-	34.3	34.3	31.4	0.0	-	-	10.5	81.5	7.3	0.8	-	-	20.3	68.0	11.7	0.0	-	-	-
Total %	3.5	8.7	4.0	0.0	-	16.2	2.8	2.8	2.6	0.0	-	8.2	3.1	23.8	2.1	0.2	-	29.2	9.4	31.5	5.4	0.0	-	46.4	-
PHF	0.750	0.841	0.708	0.000	-	0.908	0.600	0.750	0.550	0.000	-	0.795	0.813	0.743	0.750	0.250	-	0.756	0.667	0.817	0.719	0.000	-	0.807	0.940
Lights	15	37	16	0	-	68	12	11	11	0	-	34	13	101	9	1	-	124	38	133	23	0	-	194	420
% Lights	100.0	100.0	94.1	-	-	98.6	100.0	91.7	100.0	-	-	97.1	100.0	100.0	100.0	100.0	-	100.0	95.0	99.3	100.0	-	-	98.5	98.8
Mediums	0	0	1	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	2	1	0	0	-	3	5
% Mediums	0.0	0.0	5.9	-	-	1.4	0.0	8.3	0.0	-	-	2.9	0.0	0.0	0.0	0.0	-	0.0	5.0	0.7	0.0	-	-	1.5	1.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	26	-	-	-	-	-	12	-	-	-	-	-	36	-	-	-	-	-	19	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Pine Street
Site Code:
Start Date: 07/18/2017



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Pearl Street & Pine Street
Site Code:
Start Date: 07/18/2017

APPENDIX B
TRIP DISTRIBUTION CALCULATIONS



INBOUND

Thu Jun 21 2018 17:08:42 GMT-0400 (Eastern Daylight Time) - Run Time: 2228ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd_orig
Column: Primary travel mode of trip - mode_prime
Table: Ward number of destination - ward_dest

Filters:
Ward number of destination - ward_dest In 166
and
Primary travel mode of trip - mode_prime In D
and
Start time of trip - start_time In 1600 - 1800

Trip 2016
Table: 166

	Auto driver			
PD 1 of Toronto	77			
PD 7 of Toronto	22			
PD 8 of Toronto	10			
PD 9 of Toronto	39			
King	10			
Brampton	30			
Mississauga	377	565	5.78%	
Halton Hills	14			
Milton	197			
Oakville	899	1110	11.36%	
Burlington	6377	6377	65.27%	
Flamborough	152			
Dundas	52			
Ancaster	86			
Glanbrook	74			
Stoney Creek	112			
Hamilton	854	1330	13.61%	
Grimsby	37			
Lincoln	33			
St. Catharines	37			
Fort Erie	42	149	1.53%	
Waterloo	10			
Kitchener	36			
Cambridge	41			
City of Guelph	9			
New Tecumseth	18			
Oxford	35			
Brant	11			
Brantford	79	239	2.45%	
	9770			

OUTBOUND

Thu Jun 21 2018 17:05:14 GMT-0400 (Eastern Daylight Time) - Run Time: 2425ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: Primary travel mode of trip - mode_prime
Table: Ward number of origin - ward_orig

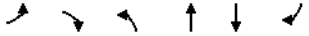
Filters:
Ward number of origin - ward_orig In 166
and
Primary travel mode of trip - mode_prime In D
and
Start time of trip - start_time In 700 - 900

Trip 2016
Table: 166

	Auto driver		
PD 1 of Toronto	54		
PD 3 of Toronto	16		
PD 8 of Toronto	19		
PD 9 of Toronto	11		
PD 11 of Toronto	19		
King	10		
Caledon	18		
Brampton	130		
Mississauga	304	581	7.91%
Milton	101		
Oakville	973	1074	14.62%
Burlington	4333	4333	58.98%
Flamborough	136		
Dundas	38		
Ancaster	22		
Stoney Creek	89		
Hamilton	786	1071	14.58%
Niagara-on-the-Lake	16		
St. Catharines	18		
Niagara Falls	58		
Fort Erie	42	134	1.82%
Kitchener	65		
Cambridge	41		
City of Guelph	48	154	2.10%
	7347		

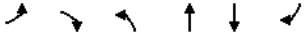
APPENDIX C
OPERATIONAL REPORTS





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	27	16	9	55	14	5
Future Volume (vph)	27	16	9	55	14	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.950				0.966	
Flt Protected	0.969			0.993		
Satd. Flow (prot)	1675	0	0	1824	1835	0
Flt Permitted	0.969			0.993		
Satd. Flow (perm)	1675	0	0	1824	1835	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		2	8			8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	4%	0%	0%
Adj. Flow (vph)	29	17	10	60	15	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	0	0	70	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	16	9	55	14	5
Future Volume (Veh/h)	27	16	9	55	14	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	17	10	60	15	5
Pedestrians	8			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	106	28	28			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106	28	28			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	97	98	99			
cM capacity (veh/h)	869	1045	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	70	20
Volume Left	29	10	0
Volume Right	17	0	5
cSH	927	1588	1700
Volume to Capacity	0.05	0.01	0.01
Queue Length 95th (m)	1.3	0.2	0.0
Control Delay (s)	9.1	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	1.1	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		3.6		
Intersection Capacity Utilization		20.7%	ICU Level of Service	A
Analysis Period (min)		15		

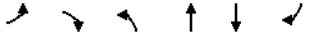
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	17	9	7	2	5	15	77	9	17	51	26
Future Volume (vph)	15	17	9	7	2	5	15	77	9	17	51	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.969			0.955			0.988			0.963	
Flt Protected		0.982			0.974			0.993			0.991	
Satd. Flow (prot)	0	1760	0	0	1767	0	0	1844	0	0	1774	0
Flt Permitted		0.982			0.974			0.993			0.991	
Satd. Flow (perm)	0	1760	0	0	1767	0	0	1844	0	0	1774	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	14		21	21		14	19		10	10		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	12%	0%	0%	0%	0%	0%	12%	0%	2%	4%
Adj. Flow (vph)	16	18	10	8	2	5	16	84	10	18	55	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	15	0	0	110	0	0	101	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	17	9	7	2	5	15	77	9	17	51	26
Future Volume (vph)	15	17	9	7	2	5	15	77	9	17	51	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	18	10	8	2	5	16	84	10	18	55	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	44	15	110	101
Volume Left (vph)	16	8	16	18
Volume Right (vph)	10	5	10	28
Hadj (s)	-0.02	-0.09	-0.01	-0.09
Departure Headway (s)	4.4	4.3	4.1	4.1
Degree Utilization, x	0.05	0.02	0.13	0.11
Capacity (veh/h)	785	790	848	869
Control Delay (s)	7.6	7.4	7.7	7.6
Approach Delay (s)	7.6	7.4	7.7	7.6
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.6			
Level of Service		A			
Intersection Capacity Utilization		25.5%	ICU Level of Service		A
Analysis Period (min)		15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	23	22	63	13	13
Future Volume (vph)	65	23	22	63	13	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.932	
Flt Protected	0.964			0.987		
Satd. Flow (prot)	1767	0	0	1848	1771	0
Flt Permitted	0.964			0.987		
Satd. Flow (perm)	1767	0	0	1848	1771	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		9	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Adj. Flow (vph)	71	25	24	68	14	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	0	0	92	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	23	22	63	13	13
Future Volume (Veh/h)	65	23	22	63	13	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	25	24	68	14	14
Pedestrians	5			9		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	142	35	33			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142	35	33			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	98			
cM capacity (veh/h)	839	1032	1585			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	96	92	28
Volume Left	71	24	0
Volume Right	25	0	14
cSH	882	1585	1700
Volume to Capacity	0.11	0.02	0.02
Queue Length 95th (m)	2.9	0.4	0.0
Control Delay (s)	9.6	2.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	2.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

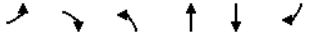
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	38	17	12	12	11	13	103	9	41	137	23
Future Volume (vph)	15	38	17	12	12	11	13	103	9	41	137	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	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		0.968			0.957			0.990			0.985	
Flt Protected		0.989			0.983			0.995			0.990	
Satd. Flow (prot)	0	1793	0	0	1740	0	0	1872	0	0	1822	0
Flt Permitted		0.989			0.983			0.995			0.990	
Satd. Flow (perm)	0	1793	0	0	1740	0	0	1872	0	0	1822	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	19		36	36		19	26		12	12		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	8%	0%	0%	0%	0%	5%	1%	0%
Adj. Flow (vph)	16	41	18	13	13	12	14	112	10	45	149	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	0	38	0	0	136	0	0	219	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.4%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	38	17	12	12	11	13	103	9	41	137	23
Future Volume (vph)	15	38	17	12	12	11	13	103	9	41	137	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	41	18	13	13	12	14	112	10	45	149	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	75	38	136	219
Volume Left (vph)	16	13	14	45
Volume Right (vph)	18	12	10	25
Hadj (s)	-0.08	-0.07	-0.02	0.00
Departure Headway (s)	4.7	4.7	4.4	4.3
Degree Utilization, x	0.10	0.05	0.17	0.26
Capacity (veh/h)	707	694	786	798
Control Delay (s)	8.2	8.0	8.3	8.9
Approach Delay (s)	8.2	8.0	8.3	8.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	32	19	13	78	45	13
Future Volume (vph)	32	19	13	78	45	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.949				0.970	
Flt Protected	0.970			0.993		
Satd. Flow (prot)	1676	0	0	1824	1843	0
Flt Permitted	0.970			0.993		
Satd. Flow (perm)	1676	0	0	1824	1843	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		2	8			8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	4%	0%	0%
Adj. Flow (vph)	35	21	14	85	49	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	56	0	0	99	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	19	13	78	45	13
Future Volume (Veh/h)	32	19	13	78	45	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	21	14	85	49	14
Pedestrians	8			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	177	66	71			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177	66	71			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	789	995	1532			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	56	99	63
Volume Left	35	14	0
Volume Right	21	0	14
cSH	855	1532	1700
Volume to Capacity	0.07	0.01	0.04
Queue Length 95th (m)	1.7	0.2	0.0
Control Delay (s)	9.5	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	22.1%	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)	16	22	9	10	7	5	16	91	10	19	58	27
Future Volume (vph)	16	22	9	10	7	5	16	91	10	19	58	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.974			0.972			0.988			0.965	
Flt Protected		0.984			0.978			0.993			0.991	
Satd. Flow (prot)	0	1779	0	0	1806	0	0	1845	0	0	1779	0
Flt Permitted		0.984			0.978			0.993			0.991	
Satd. Flow (perm)	0	1779	0	0	1806	0	0	1845	0	0	1779	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	14		21	21		14	19		10	10		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	12%	0%	0%	0%	0%	0%	12%	0%	2%	4%
Adj. Flow (vph)	17	24	10	11	8	5	17	99	11	21	63	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	24	0	0	127	0	0	113	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.1%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	22	9	10	7	5	16	91	10	19	58	27
Future Volume (vph)	16	22	9	10	7	5	16	91	10	19	58	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	24	10	11	8	5	17	99	11	21	63	29

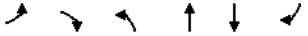
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	51	24	127	113
Volume Left (vph)	17	11	17	21
Volume Right (vph)	10	5	11	29
Hadj (s)	-0.01	-0.03	-0.01	-0.08
Departure Headway (s)	4.4	4.5	4.2	4.1
Degree Utilization, x	0.06	0.03	0.15	0.13
Capacity (veh/h)	766	752	835	851
Control Delay (s)	7.7	7.6	7.9	7.7
Approach Delay (s)	7.7	7.6	7.9	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	79	33	24	105	32	19
Future Volume (vph)	79	33	24	105	32	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.960				0.949	
Flt Protected	0.966			0.991		
Satd. Flow (prot)	1762	0	0	1853	1803	0
Flt Permitted	0.966			0.991		
Satd. Flow (perm)	1762	0	0	1853	1803	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		9	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Adj. Flow (vph)	86	36	26	114	35	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	122	0	0	140	56	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	33	24	105	32	19
Future Volume (Veh/h)	79	33	24	105	32	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	36	26	114	35	21
Pedestrians	5			9		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	216	60	61			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216	60	61			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	96	98			
cM capacity (veh/h)	760	1000	1549			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	122	140	56
Volume Left	86	26	0
Volume Right	36	0	21
cSH	818	1549	1700
Volume to Capacity	0.15	0.02	0.03
Queue Length 95th (m)	4.2	0.4	0.0
Control Delay (s)	10.2	1.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	1.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

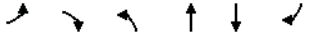
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	53	18	15	17	12	14	120	12	47	161	24
Future Volume (vph)	16	53	18	15	17	12	14	120	12	47	161	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	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		0.972			0.963			0.989			0.986	
Flt Protected		0.991			0.983			0.995			0.990	
Satd. Flow (prot)	0	1807	0	0	1745	0	0	1870	0	0	1824	0
Flt Permitted		0.991			0.983			0.995			0.990	
Satd. Flow (perm)	0	1807	0	0	1745	0	0	1870	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	19		36	36		19	26		12	12		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	8%	0%	0%	0%	0%	5%	1%	0%
Adj. Flow (vph)	17	58	20	16	18	13	15	130	13	51	175	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	47	0	0	158	0	0	252	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	53	18	15	17	12	14	120	12	47	161	24
Future Volume (vph)	16	53	18	15	17	12	14	120	12	47	161	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	58	20	16	18	13	15	130	13	51	175	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	95	47	158	252
Volume Left (vph)	17	16	15	51
Volume Right (vph)	20	13	13	26
Hadj (s)	-0.07	-0.05	-0.03	0.01
Departure Headway (s)	4.8	4.9	4.5	4.5
Degree Utilization, x	0.13	0.06	0.20	0.31
Capacity (veh/h)	679	657	760	774
Control Delay (s)	8.6	8.3	8.6	9.5
Approach Delay (s)	8.6	8.3	8.6	9.5
Approach LOS	A	A	A	A

Intersection Summary					
Delay		9.0			
Level of Service		A			
Intersection Capacity Utilization		40.2%	ICU Level of Service		A
Analysis Period (min)		15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	25	15	78	45	13
Future Volume (vph)	33	25	15	78	45	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942				0.970	
Flt Protected	0.972			0.992		
Satd. Flow (prot)	1673	0	0	1823	1843	0
Flt Permitted	0.972			0.992		
Satd. Flow (perm)	1673	0	0	1823	1843	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		2	8			8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	4%	0%	0%
Adj. Flow (vph)	36	27	16	85	49	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	63	0	0	101	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	25	15	78	45	13
Future Volume (Veh/h)	33	25	15	78	45	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	27	16	85	49	14
Pedestrians	8			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	181	66	71			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181	66	71			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	95	97	99			
cM capacity (veh/h)	784	995	1532			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	63	101	63
Volume Left	36	16	0
Volume Right	27	0	14
cSH	862	1532	1700
Volume to Capacity	0.07	0.01	0.04
Queue Length 95th (m)	1.9	0.3	0.0
Control Delay (s)	9.5	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

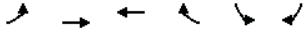
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	23	9	14	9	6	16	91	12	20	58	27
Future Volume (vph)	16	23	9	14	9	6	16	91	12	20	58	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.974			0.970			0.986			0.966	
Flt Protected		0.984			0.977			0.993			0.990	
Satd. Flow (prot)	0	1780	0	0	1801	0	0	1838	0	0	1779	0
Flt Permitted		0.984			0.977			0.993			0.990	
Satd. Flow (perm)	0	1780	0	0	1801	0	0	1838	0	0	1779	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	14		21	21		14	19		10	10		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	12%	0%	0%	0%	0%	0%	12%	0%	2%	4%
Adj. Flow (vph)	17	25	10	15	10	7	17	99	13	22	63	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	0	0	32	0	0	129	0	0	114	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	23	9	14	9	6	16	91	12	20	58	27
Future Volume (vph)	16	23	9	14	9	6	16	91	12	20	58	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	25	10	15	10	7	17	99	13	22	63	29

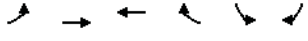
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	52	32	129	114
Volume Left (vph)	17	15	17	22
Volume Right (vph)	10	7	13	29
Hadj (s)	-0.01	-0.04	-0.01	-0.08
Departure Headway (s)	4.5	4.5	4.2	4.2
Degree Utilization, x	0.06	0.04	0.15	0.13
Capacity (veh/h)	762	751	830	844
Control Delay (s)	7.8	7.6	7.9	7.8
Approach Delay (s)	7.8	7.6	7.9	7.8
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.8			
Level of Service		A			
Intersection Capacity Utilization		26.2%	ICU Level of Service		A
Analysis Period (min)		15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	51	23	2	6	8
Future Volume (vph)	4	51	23	2	6	8
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		0.924	
Flt Protected		0.997			0.979	
Satd. Flow (prot)	0	1857	1844	0	1685	0
Flt Permitted		0.997			0.979	
Satd. Flow (perm)	0	1857	1844	0	1685	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		78.9	49.3		65.0	
Travel Time (s)		5.7	3.5		4.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	55	25	2	7	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	59	27	0	16	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	

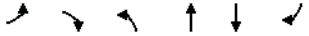
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	51	23	2	6	8
Future Volume (Veh/h)	4	51	23	2	6	8
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)	4	55	25	2	7	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	27				89	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				89	26
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1587				909	1050

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	59	27	16
Volume Left	4	0	7
Volume Right	0	2	9
cSH	1587	1700	983
Volume to Capacity	0.00	0.02	0.02
Queue Length 95th (m)	0.1	0.0	0.4
Control Delay (s)	0.5	0.0	8.7
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	37	28	105	32	20
Future Volume (vph)	80	37	28	105	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.957				0.948	
Flt Protected	0.967			0.990		
Satd. Flow (prot)	1758	0	0	1852	1801	0
Flt Permitted	0.967			0.990		
Satd. Flow (perm)	1758	0	0	1852	1801	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	49.3			123.3	105.1	
Travel Time (s)	3.5			8.9	7.6	
Confl. Peds. (#/hr)		9	5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Adj. Flow (vph)	87	40	30	114	35	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	0	0	144	57	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
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	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	37	28	105	32	20
Future Volume (Veh/h)	80	37	28	105	32	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	40	30	114	35	22
Pedestrians	5			9		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	225	60	62			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225	60	62			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	96	98			
cM capacity (veh/h)	750	999	1547			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	127	144	57
Volume Left	87	30	0
Volume Right	40	0	22
cSH	814	1547	1700
Volume to Capacity	0.16	0.02	0.03
Queue Length 95th (m)	4.4	0.5	0.0
Control Delay (s)	10.2	1.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	1.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	29.0%	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)	16	55	18	18	19	13	14	120	16	48	161	24
Future Volume (vph)	16	55	18	18	19	13	14	120	16	48	161	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.972			0.966			0.986			0.986	
Flt Protected		0.991			0.982			0.995			0.990	
Satd. Flow (prot)	0	1808	0	0	1749	0	0	1864	0	0	1823	0
Flt Permitted		0.991			0.982			0.995			0.990	
Satd. Flow (perm)	0	1808	0	0	1749	0	0	1864	0	0	1823	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.0			78.9			117.4			70.1	
Travel Time (s)		5.2			5.7			8.5			5.0	
Confl. Peds. (#/hr)	19		36	36		19	26		12	12		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	8%	0%	0%	0%	0%	5%	1%	0%
Adj. Flow (vph)	17	60	20	20	21	14	15	130	17	52	175	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	97	0	0	55	0	0	162	0	0	253	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)		0.0			0.0			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												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

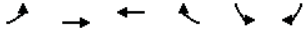
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.7%	ICU Level of Service A	
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	55	18	18	19	13	14	120	16	48	161	24
Future Volume (vph)	16	55	18	18	19	13	14	120	16	48	161	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	60	20	20	21	14	15	130	17	52	175	26

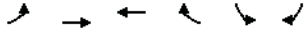
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	97	55	162	253
Volume Left (vph)	17	20	15	52
Volume Right (vph)	20	14	17	26
Hadj (s)	-0.07	-0.03	-0.04	0.01
Departure Headway (s)	4.9	5.0	4.5	4.5
Degree Utilization, x	0.13	0.08	0.20	0.32
Capacity (veh/h)	672	652	755	767
Control Delay (s)	8.6	8.4	8.7	9.5
Approach Delay (s)	8.6	8.4	8.7	9.5
Approach LOS	A	A	A	A

Intersection Summary					
Delay		9.0			
Level of Service		A			
Intersection Capacity Utilization		40.7%	ICU Level of Service		A
Analysis Period (min)		15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	112	43	5	5	6
Future Volume (vph)	7	112	43	5	5	6
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			0.987		0.921	
Flt Protected		0.997			0.980	
Satd. Flow (prot)	0	1857	1839	0	1681	0
Flt Permitted		0.997			0.980	
Satd. Flow (perm)	0	1857	1839	0	1681	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		78.9	49.3		65.0	
Travel Time (s)		5.7	3.5		4.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	122	47	5	5	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	130	52	0	12	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	21.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	112	43	5	5	6
Future Volume (Veh/h)	7	112	43	5	5	6
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)	8	122	47	5	5	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	52				188	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	52				188	50
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1554				797	1019

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	130	52	12
Volume Left	8	0	5
Volume Right	0	5	7
cSH	1554	1700	913
Volume to Capacity	0.01	0.03	0.01
Queue Length 95th (m)	0.1	0.0	0.3
Control Delay (s)	0.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		