84 Nancy Street Transportation Impact, Parking and TDM Study

Paradigm Transportation Solutions Limited

June 2019

ptsl.com

Project Summary

Project Number
190433

June 2019

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84 Nancy Street Transportation Impact, Parking and TDM Study

Signatures and Seals

Signature

Engineer's Seal

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to carry out this Transportation Impact Study (TIS), Parking Study (PS) and Transportation Demand Management (TDM) Options Report for a proposed adult lifestyle residential development located at 84 Nancy Street in the Town of Caledon (Bolton), Region of Peel.

The study includes an analysis of existing traffic conditions, a description of the proposed development, the development and analysis of future traffic forecasts, parking demand analysis, and outlines recommendations to improve future traffic conditions and strategies to reduce dependency on single occupancy vehicle travel.

Development Concept

The development proposes up to 159 adult lifestyle residential condominium units. The site's parking supply is noted to consist of 151 spaces within a parking structure and 31 surface parking spaces. The parking supply; however, may alter to reflect the final unit count.

Vehicular access is proposed by one (1) driveway connection at the terminus of Nancy Street. Build-out is anticipated to occur by the Year 2022; however, timing is subject to market conditions.

Conclusions

The main findings and conclusions of this study are as follows:

- **Study Area:** The intersections that form the study area include the Nancy Street intersections with King Street West and Elizabeth Street and the intersection of Elizabeth Street at Queen Street South.
- **Existing Traffic Conditions:** The intersections within the study area are currently operating with acceptable levels of service during the AM and PM peak hours.
- **Forecast Traffic:** The forecast traffic volumes near the subject site have been assessed for an Opening date horizon (Year 2022) and five years (Year 2027) beyond the opening date. The projected traffic volumes near the subject site are estimated to consist of:
  - Generalized background traffic growth;
  - Build-out of two (2) adjacent developments; and

  - Traffic generated by the subject site.

- **Background Traffic Conditions:** The intersections within the study area are forecast to continue to operate with acceptable levels of service during the AM and PM peak hours.
- **Parking:** The proposed parking supply for the subject site will consist of 182 spaces and results in a theoretical shortfall of 97 parking spaces in comparison to the Town of Caledon Zoning By-law parking requirements. Confirmed through parking utilization surveys, the 182 spaces will be sufficient to accommodate the anticipated parking demand at the proposed parking supply rate of 1.15 spaces per unit.
- **Transportation Demand Management:** The site concept plan includes TDM measures intended to assist in mitigating the site's transportation and parking impacts.
- **Development Generated Traffic:** The subject site is estimated to generate approximately 54 new AM peak hour trips and approximately 70 new PM peak hour trips
- **Total Traffic Conditions:** The intersections within the study area are forecast to continue to operate with acceptable levels of service during the AM and PM peak hours.
- **Remedial Measures:** No changes to the existing form of traffic control at the study area intersections is necessary to accommodate background growth or development related traffic. A northbound left-turn lane at the Queen Street South intersection with Elizabeth Street is warranted under existing conditions and subsequently warranted under future traffic conditions as well. However, the existing grade and retaining walls may be cost prohibitive to widening the Queen Street cross section at this location. From an operational perspective, the existing approach configuration is forecast to continue operating at an acceptable level of service under future traffic conditions.

Recommendations

Based on the findings of this study, the following is recommended:

- The proposed driveway connection to the external road network shall operate under two-way stop control.
- The TDM measures outlined in **Section 3.2** and **Section 5.4** be included in the future design of the subject site. Some elements of the TDM plan can be designed directly into the site plan while other elements can only be achieved after occupancy. The

implementation of the TDM plan should assist in further reducing on-site parking demand.

- The site's parking supply be adjusted to reflect the final unit count. A parking supply ratio of at least 1.15 spaces per unit should be utilized for designing the final site plan.
- The occupant parking for each unit is recommended to be unbundled from the cost of the unit and the parking supply for residents be limited to no more than 1.00 space per unit.

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Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to carry out this Transportation Impact Study (TIS) and Parking Study (PS) and Transportation Demand Management (TDM) Options Report for a proposed adult lifestyle residential development located at 84 Nancy Street in the Town of Caledon (Bolton), Region of Peel.

Figure 1.1 details the location of the subject site.

The study includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts, parking demand analysis, and outlines recommendations to improve future traffic conditions and strategies to reduce dependency on single occupancy vehicle travel:

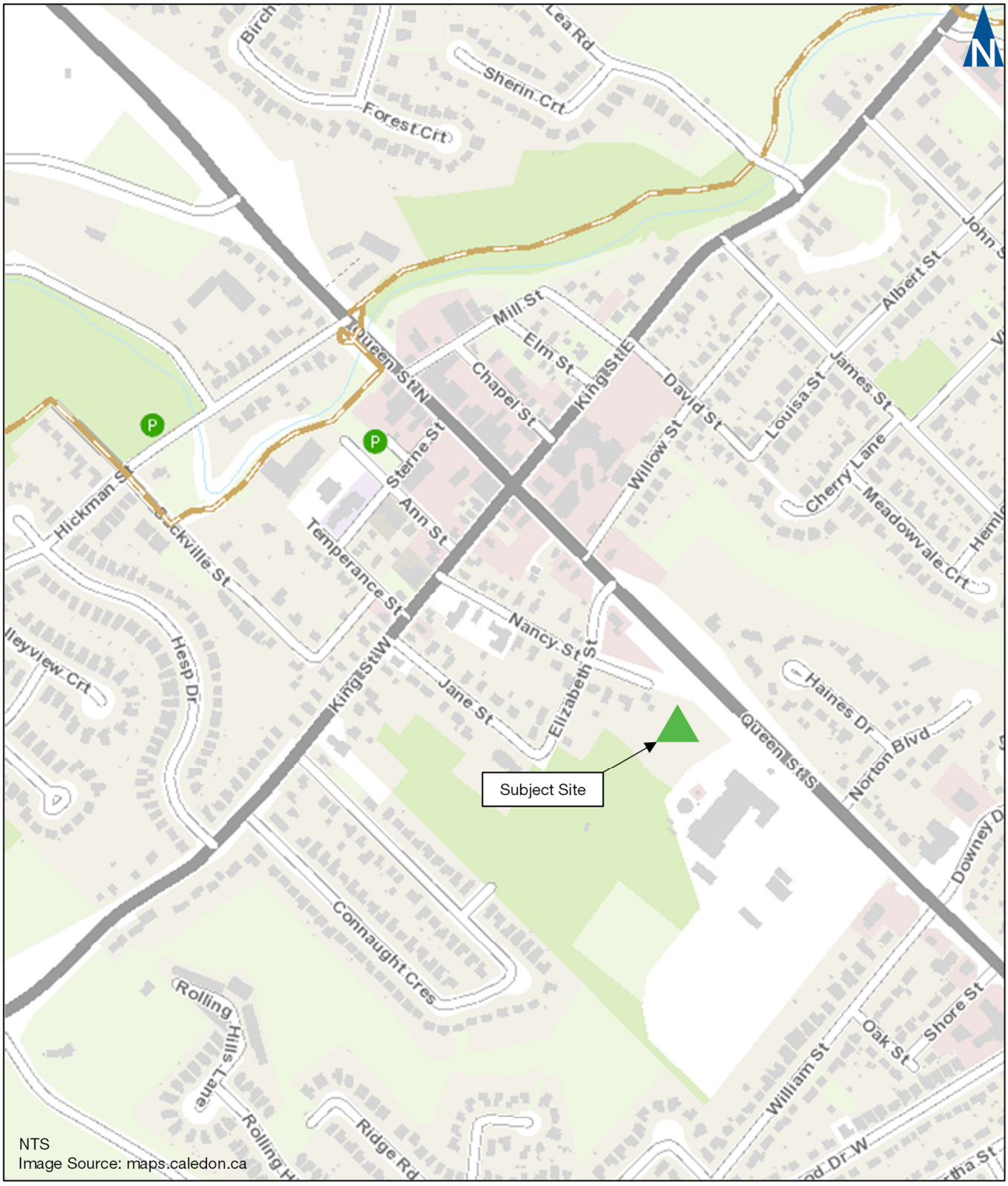
- Assessment of the current traffic and site conditions within the study area;
- Estimates of background traffic growth;
- Estimates of additional traffic generated by the subject site;
- Analyses of the impact of the future traffic on the surrounding road network;
- Identification and recommendation of Transportation Demand Management (TDM) measures specific to this site;
- Determining the site's parking needs and providing recommendations to mitigate parking demands; and
- Recommendations necessary to mitigate the site generated traffic in a satisfactory manner.

Appendix A contains the pre-study consultation material and responses from the Town and the Region.

1.2 Study Area

The municipal roadway intersections assessed in this study include:

- Nancy Street and King Street West;
- Nancy Street and Elizabeth Street;
- Elizabeth Street and Queen Street South; and
- The proposed site driveway connections to Nancy Street.



Location of Subject Site

84 Nancy Street
190433

Figure 1.1

2 Existing Conditions

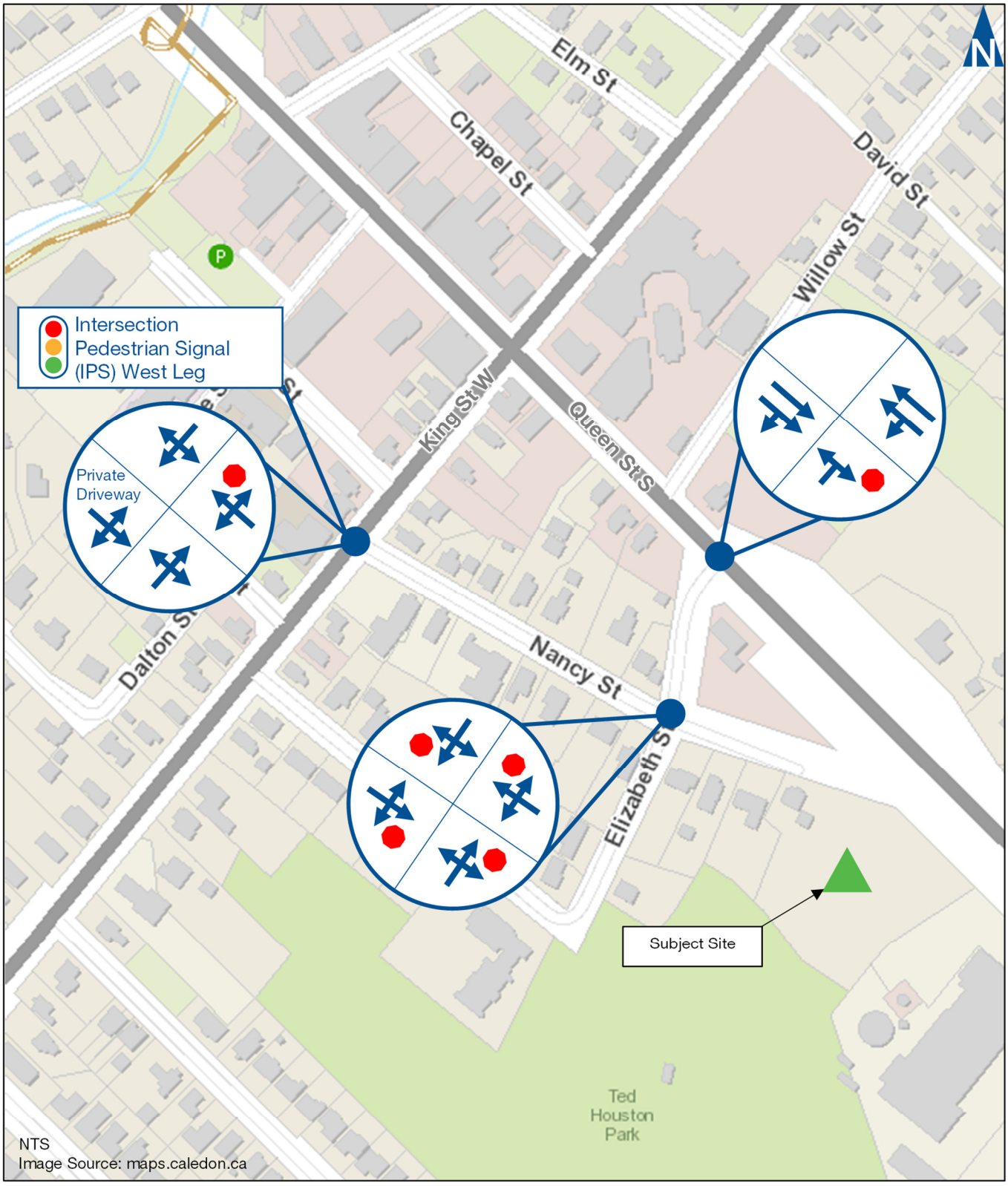
2.1 Existing Roadways

The main roadways near the subject site considered in assessing the traffic impacts of the development include:

- **King Street West (Regional Road 9)** is an east/west major regional arterial[1] roadway with a two-lane urban cross section and a posted speed limit of 50 kilometres per hour. No visible cycling infrastructure is present along this roadway. Sidewalks are provided along both sides of this roadway within the study area.
- **Queen Street South (Regional Road 50)** is a north-south arterial roadway with a four-lane urban cross section and a posted speed limit of 50 kilometres per hour. No visible cycling infrastructure is present along this roadway. Sidewalks are provided along both sides of this roadway within the study area. Queen Street South has a significant grade that crests near Norton Boulevard to the south.
- **Nancy Street** is a north-south local road[2] with a basic two-lane urban cross-section with a posted speed limit of 40 kilometres per hour. Parking restrictions are present along the east side of this roadway. No visible cycling infrastructure is present along this roadway. Sidewalks are provided along the east side of this roadway within the study area. The intersection with Elizabeth Street operates under all-way stop control. Nancy Street has a significant grade that crests south of Elizabeth Street.
- **Elizabeth Street** is an east/west local road with a basic two-lane urban cross-section with an assumed speed limit of 40 kilometres per hour. Parking restrictions are present along both sides of this roadway. No visible cycling infrastructure is present along this roadway. Sidewalks are provided along the north side of this roadway within the study area.

Figure 2.1 details the existing lane configurations and traffic control at the study area intersections. **Figure 2.2** details the existing sidewalks within the study area.

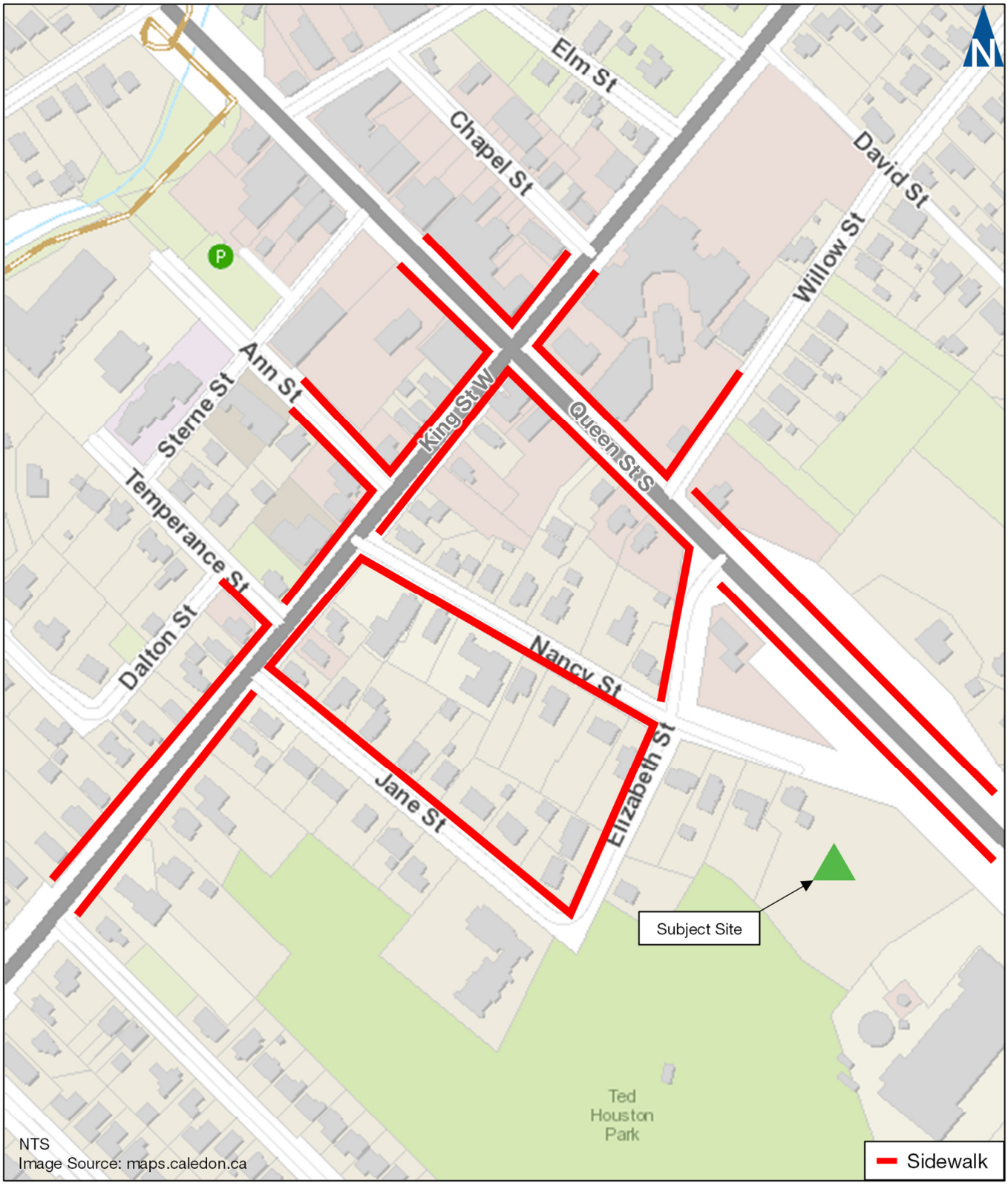
[1] Region of Peel Road Classification Map
[2] Town of Caledon Official Plan – Schedule K – Road Right-of-Way Widths



Existing Lane Configuration & Traffic Control

84 Nancy Street
190433

Figure 2.1



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Existing Sidewalks

84 Nancy Street
190433

Figure 2.2

2.2 Existing Transit Service

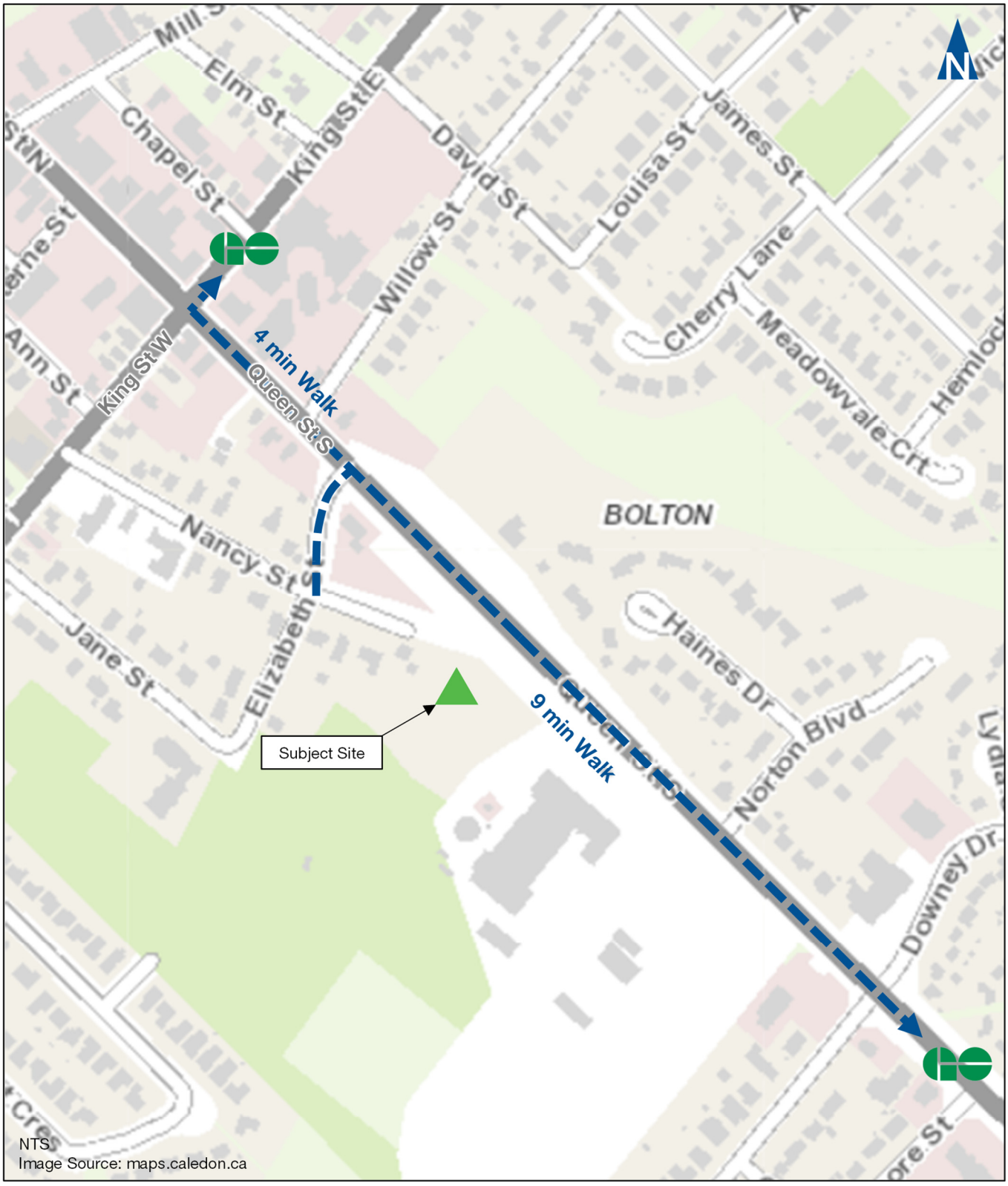
2.2.1 Local Transit Service

Currently no public transit system is currently in operation within the Town of Caledon (Bolton). The Bolton Transportation Master Plan[3] however states that the Town is considering local transit service.

2.2.2 Regional Transit Service – GO Transit

Interregional GO Transit service is provided within the community of Bolton. Route 38 Bolton is an all-day GO bus service that connects Bolton to Brampton and North York. Service connects to the Toronto Transit Commission (TTC) York Mills Station and Yorkdale bus terminals. **Figure 2.3** details the location of the existing GO Transit bus stops within the area of the subject site and highlights the estimated walk time.

[3] Bolton Transportation Master Plan Study – 9.0 Transit



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Existing GO Transit Network

84 Nancy Street
190433

Figure 2.3

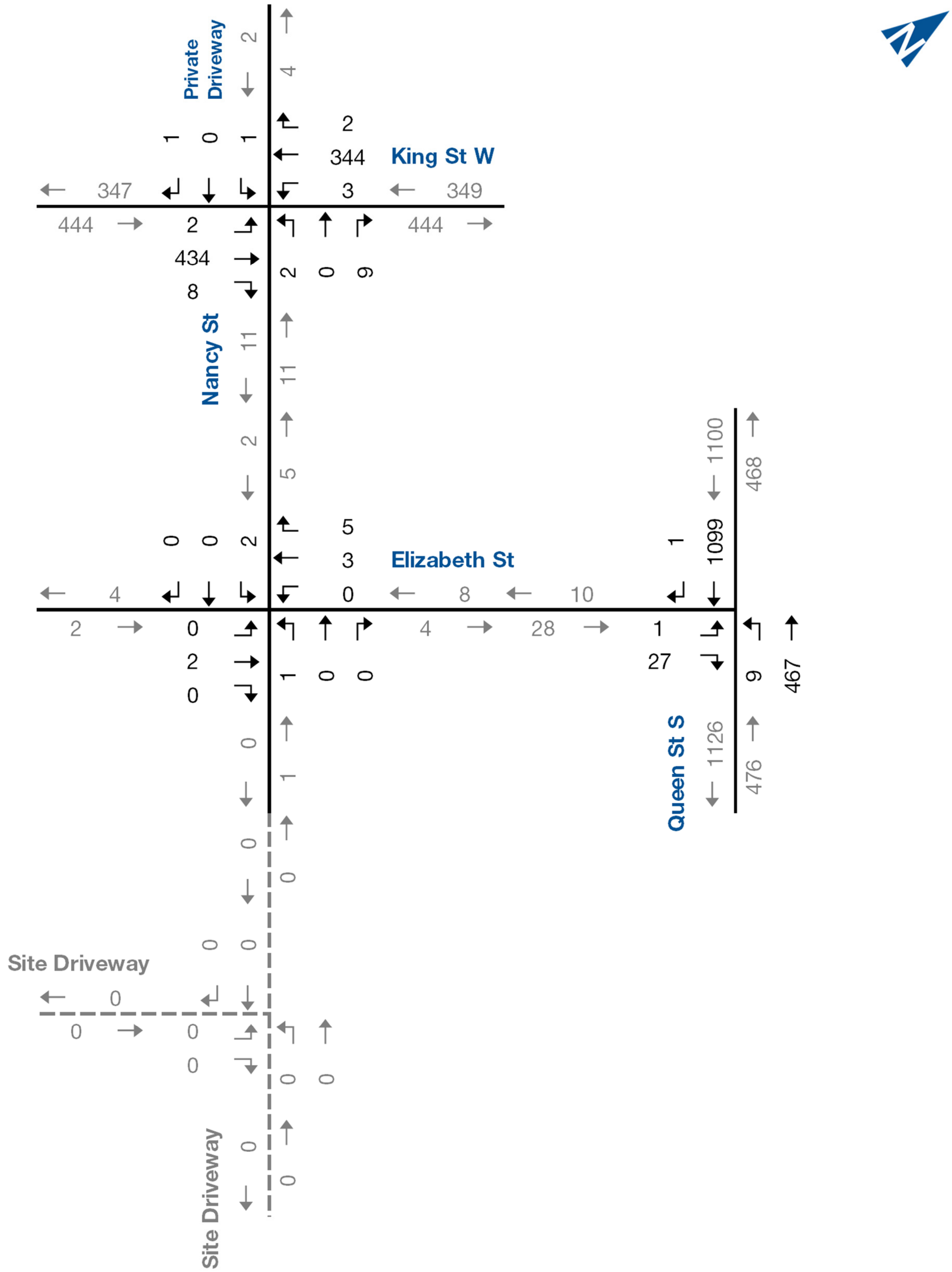
2.3 Existing Traffic Volumes

2.3.1 Existing Turning Movement Counts

Table 2.1 summarizes the location and date of the existing turning movement count (TMC) data used in the analysis. The data was collected using Miovision Scout Unit technology. **Appendix B** contains the detailed existing count data. **Figure 2.4A-B** details the existing weekday peak hour traffic volumes at the study area intersections.

TABLE 2.1: EXISTING COUNT DATA SUMMARY

Location	Date	Peak Hour (Time)	
		AM Peak	PM Peak
King Street West & Nancy Street	Thursday, 31 May 2018	07:30	16:45
Nancy Street & Elizabeth Street	Thursday, 31 May 2018	08:15	15:00
Queen Street South & Elizabeth Street	Thursday, 31 May 2018	07:45	16:45



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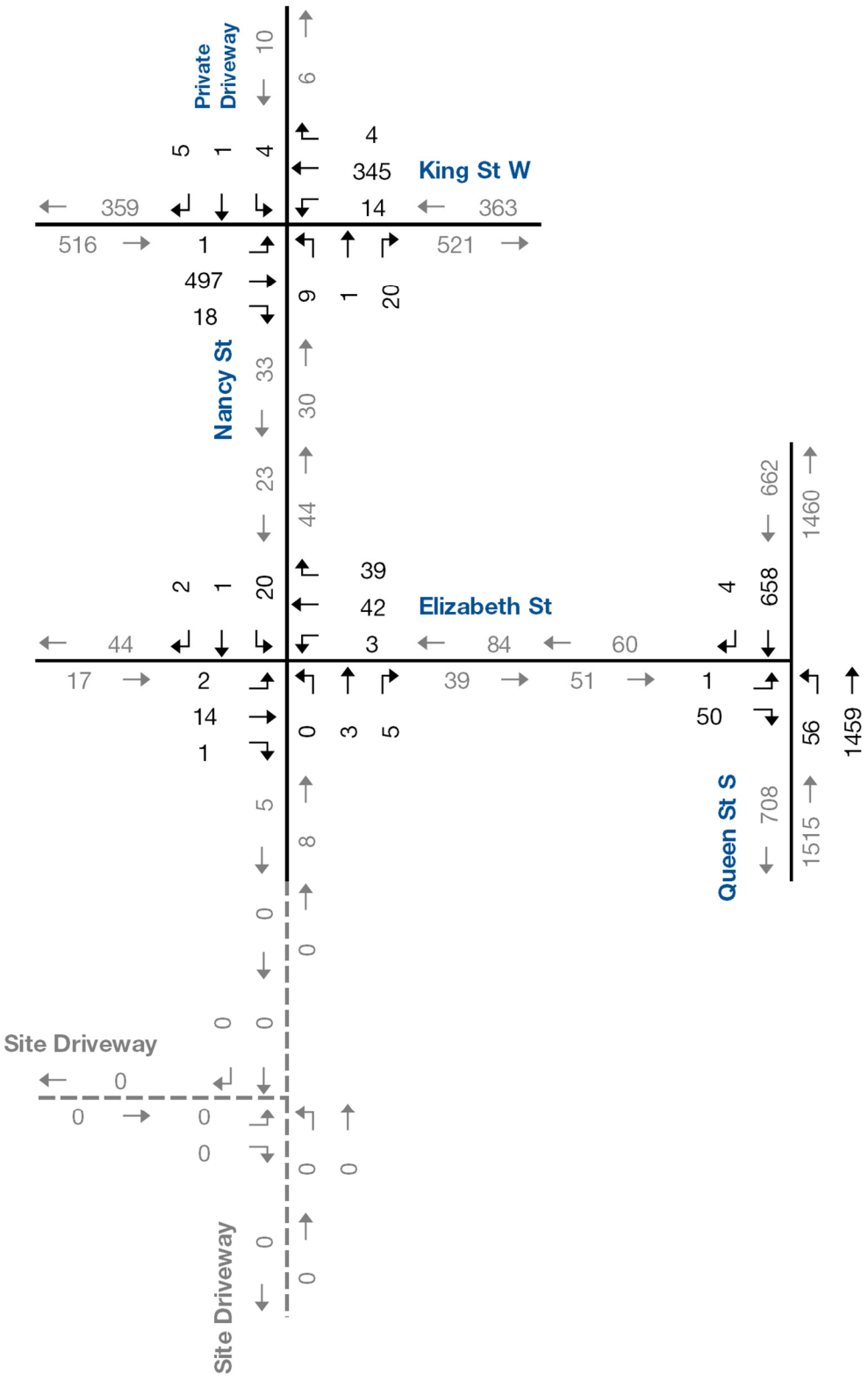
Existing Traffic – AM Peak Hour

84 Nancy Street
190433

Figure 2.4A



Existing Traffic – PM Peak Hour

84 Nancy Street
190433

Figure 2.4B

2.4 Existing 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 10.0 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 the existing lane configurations, traffic controls and the existing traffic peak volumes.

The level of service conditions on the existing road network have been assessed using Synchro 9 with HCM 2000 procedures. Movements are considered critical under the following conditions[4]:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.90 or above.
- V/C ratios for exclusive movements that will exceed 1.00.
- 95th percentile queue lengths for individual movements exceeds available lane storage. Queue lengths estimated using Synchro 9.

Table 2.2 details the existing level of service conditions. No critical movements are identified at the study area intersections. **Appendix C** contains the supporting detailed Synchro 9.

[4] Peel Region Traffic Impact Study – Terms of Reference
https://www.peelregion.ca/pw/transportation/business/impact-study.htm

TABLE 2.2: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	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	Nancy St & King St W	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	B	>	**B**	<	A	>	**A**	
			Delay	<	0	>	**0**	<	0	>	**0**	<	11	>	**11**	<	0	>	**0**	
			V/C	<	0.00	>		<	0.00	>		<	0.02	>		<	0.00	>		
			95th	<	0	>		<	0	>		<	0	>		<	0	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7.2	>	**7**	
			D. Util	<	0.00	>		<	0.01	>		<	0.00	>		<	0.00	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		B	**B**					<	A		**A**		A	>	**A**	
			Delay	<		14	**14**					<	1		**0**		0	>	**0**	
			V/C	<		0.06						<	0.18				0.43	>		
			95th	<		2						<	0				0	>		
PM Peak Hour	Nancy St & King St W	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	B	>	**B**	<	B	>	**B**	
			Delay	<	0	>	**0**	<	1	>	**1**	<	14	>	**14**	<	15	>	**15**	
			V/C	<	0.00	>		<	0.01	>		<	0.07	>		<	0.03	>		
			95th	<	0	>		<	0	>		<	2	>		<	1	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7.4	>	**7**	
			D. Util	<	0.02	>		<	0.09	>		<	0.01	>		<	0	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		B	**B**					<	A		**A**		A	>	**A**	
			Delay	<		12	**12**					<	2		**1**		0	>	**0**	
			V/C	<		0.08						<	0.58				0.26	>		
			95th	<		2						<	2				0	>		

MOE - Measure of Effectiveness
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
D. Util - Degree Utilization
95th - 95th Percentile Queue Length
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

3 Development Concept

3.1 Site Description

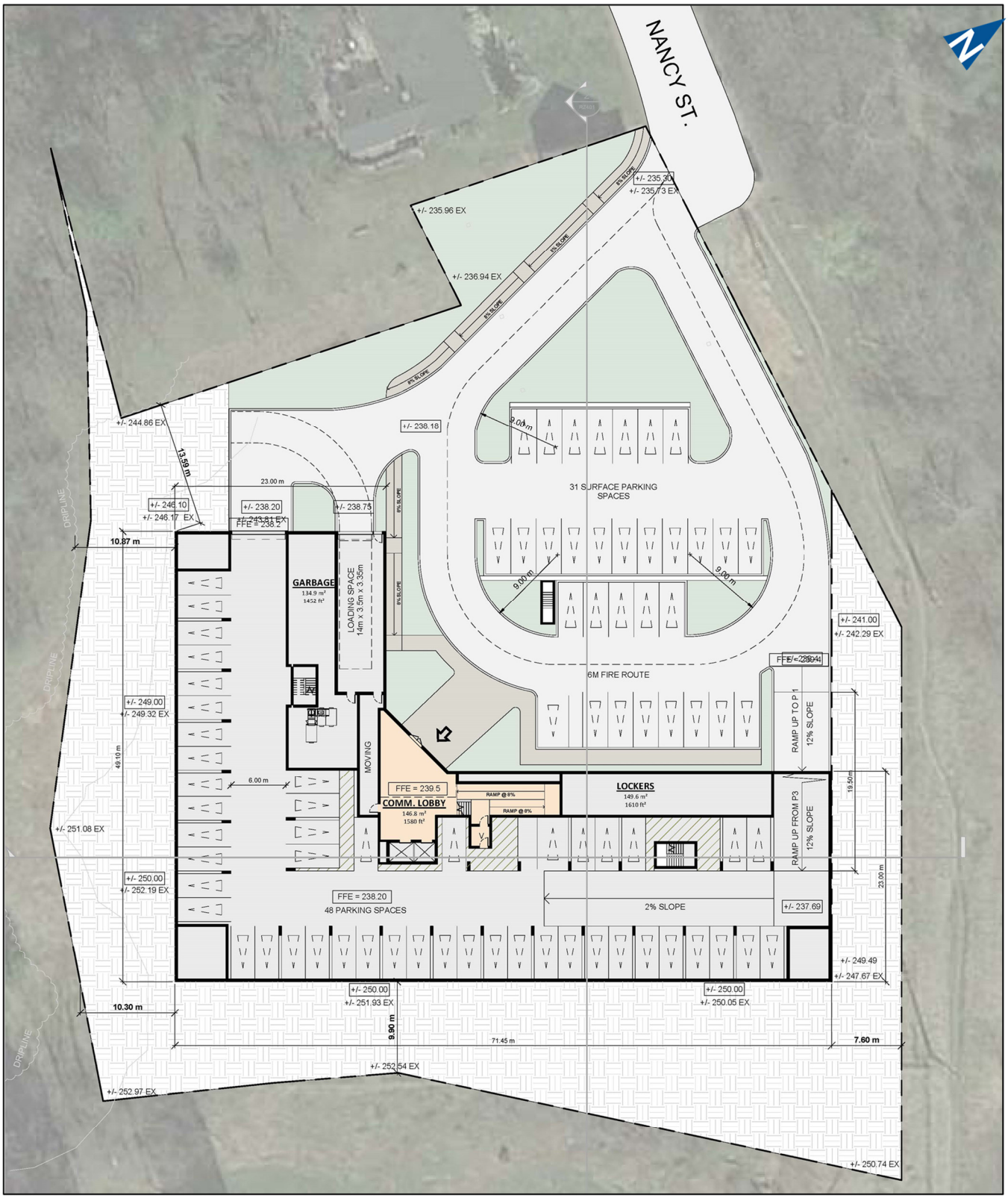
The subject site is located at 84 Nancy Street in the Town of Caledon (Bolton), Peel Region. **Figure 3.1** details the layout of the subject site.

The development proposes up to 159 adult lifestyle residential condominium units. The site's parking supply is noted to consist of 151 spaces within a parking structure and 31 surface parking spaces. The parking supply however may alter to reflect the final unit count.

Vehicular access is proposed by one (1) driveway connection at the terminus of Nancy Street. Build-out is anticipated to occur by the Year 2022; however, timing is subject to market conditions.

The site plan includes a single loading zone. The loading zone measures 14 metres by 3.5 metres with a vertical clearance of at least 3.35 metres provided.

The topography of Nancy Street south of Elizabeth Street is noted to have a gradient of approximately 9 to 11 percent. The steep grade will be challenging for pedestrians and cyclists and may present challenges in conforming to AODA requirements. The gradient may also restrict sightlines for the parking drive aisle that are proposed to connect to the driveway. Consideration should be given to reduce the number of drive aisle connections to as few as possible. Convex mirrors are recommended to be provided at the drive aisle intersection to mitigate sightline issues.



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Site Concept Plan

84 Nancy Street
190433

Figure 3.1

3.2 Transportation Demand Management – Proposed Measures

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demands. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience and availability of alternative modes of travel. Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and potentially reduce the reliance on automobiles.

The following TDM measures have been included in the current site design:

Walking Infrastructure

- On-site sidewalks are proposed to connect to future sidewalks along the west side of Nancy Street. It is recommended that the crosswalks identified on the plan intersect the roadways at 90 degrees where possible. Enhanced pavement markings and/or material can be considered to improve visibility.
- All on-site sidewalks will conform to the Town of Caledon's design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards.
- Circulatory on-site sidewalks are provided to the rear of the building that connect to on-site amenities.

Cycling Infrastructure

- A "bike locker" room is proposed on Parking Level 1. The bike locker room measures approximately 149 square metres. The design of the storage system is unknown. The long-term bicycle parking supply is recommended to be at least 0.50 spaces per unit. The bicycle room could include a bicycle repair station.

Parking Infrastructure

- Reduced minimum parking requirements

Additional TDM measures are outlined in **Section 5.4** to further assist in mitigating the site's transportation impacts.

3.3 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation[5] methods predict the site trip generation. Land Use Code 221 (Multifamily Housing (Mid-Rise) was used to estimate the site's trip generation. **Table 3.1** details the estimated trip generation.

The subject site is forecast to generate approximately 54 vehicle trips during the AM peak hour and approximately 70 vehicle trips during the PM peak hour.

TABLE 3.1: ESTIMATED TRIP GENERATION

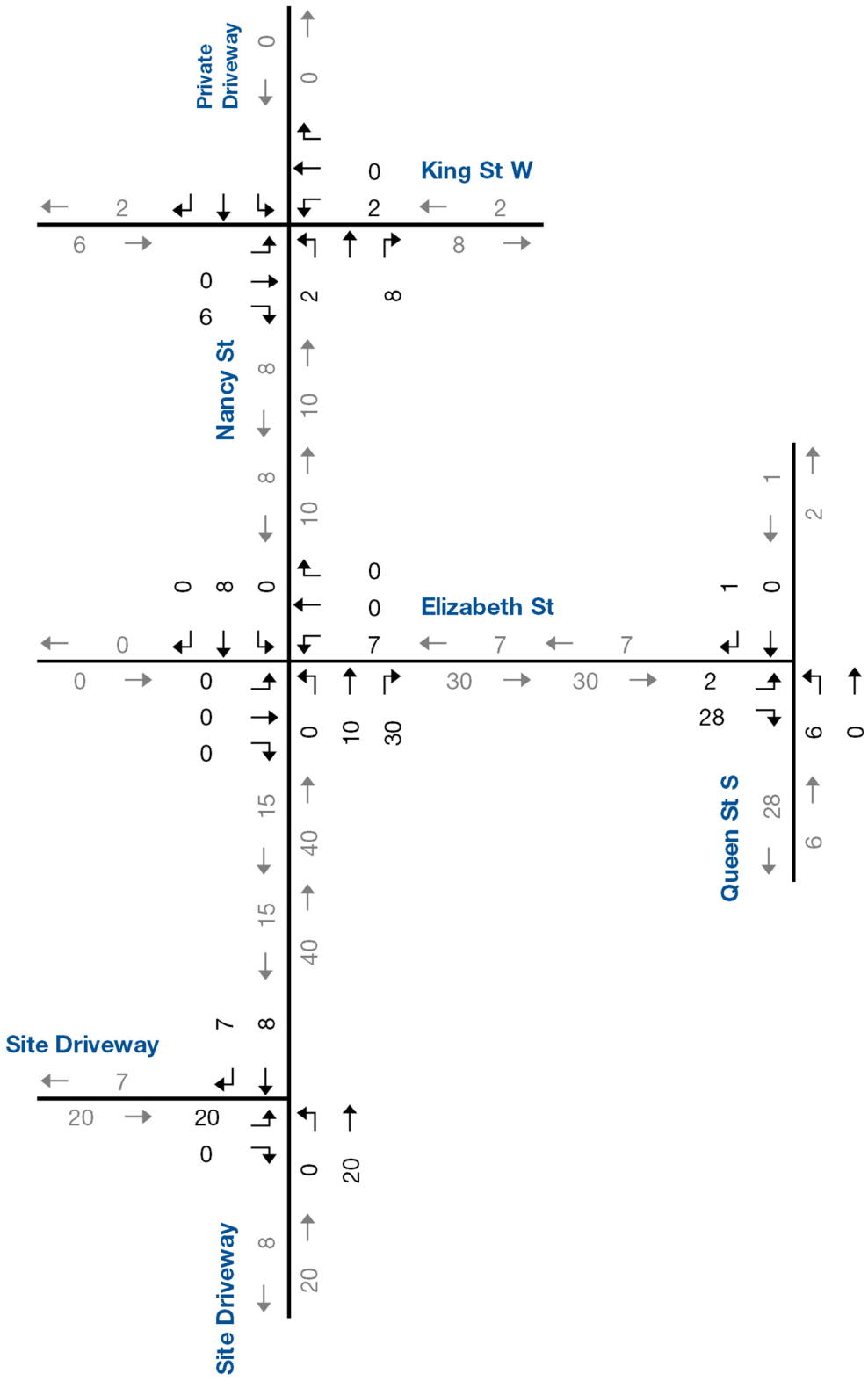
Land Use	Number of Units	AM Peak Hour				PM Peak Hour			
Multifamily Housing (Mid-Rise) (221)	159	0.67	14	40	54	0.72	43	27	70
Total Generation			**14**	**40**			**43**	**27**	**70**

Table 3.2 summarizes the estimated trip distribution. The distribution is based on the local forecast future trip patterns documented in the study area. **Figure 3.2A-B** details the site-generated traffic estimates forecast for the Opening Date Horizon. **Figure 3.3A-B** details the site-generated traffic estimates forecast for the Five-Year Horizon.

TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Designation	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Queen Street South	5%	5%	5%	0%
South via Queen Street South	40%	70%	60%	65%
East via King Street West	15%	20%	15%	25%
West via King Street West	40%	5%	20%	10%
West via Elizabeth Street	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

[5] Trip Generation Manual 10th Edition Institute of Transportation Engineers Washington DC



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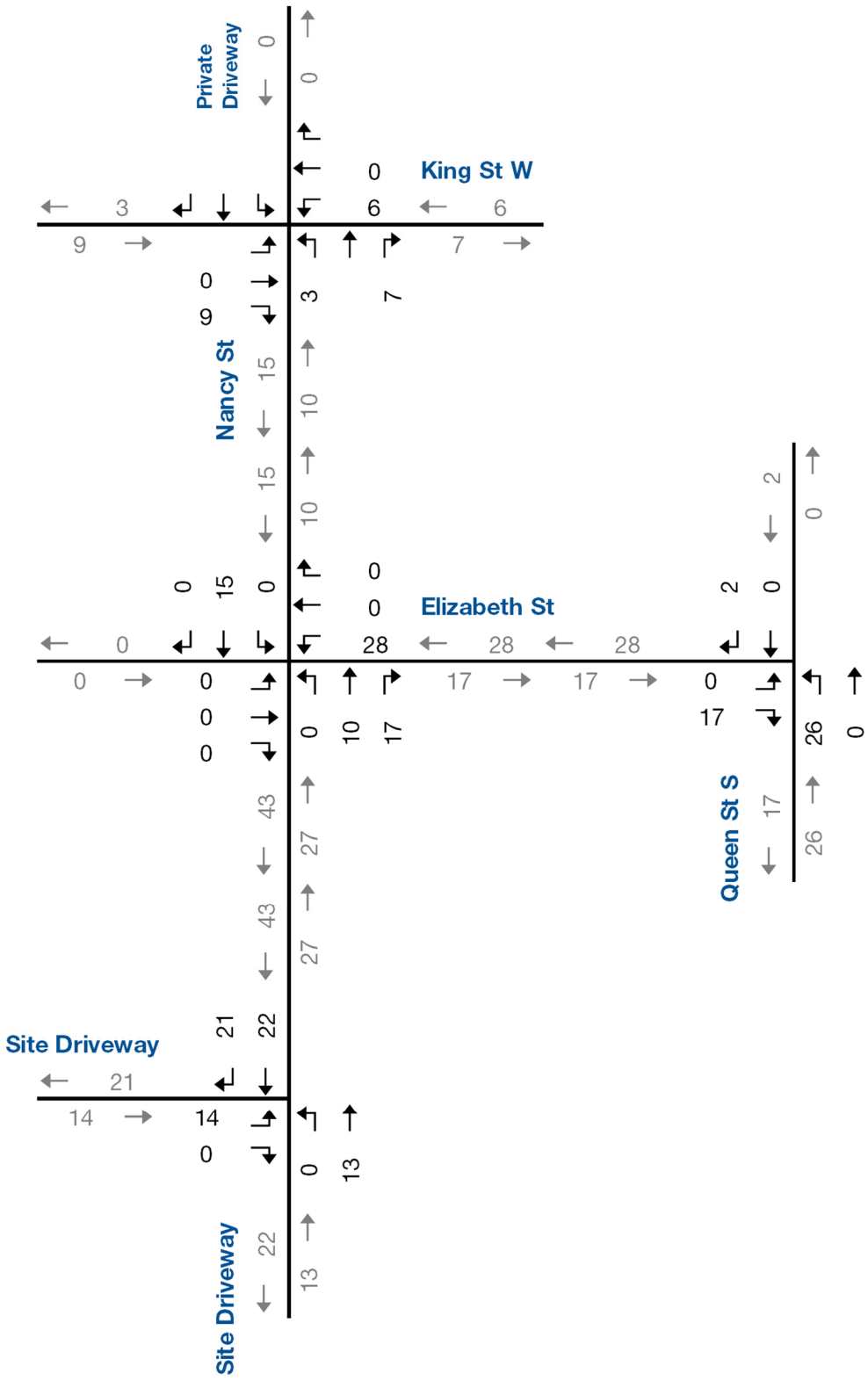
Estimated Site Generated Traffic – AM Peak Hour

84 Nancy Street
190433

Figure 3.2A



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Estimated Site Generated Traffic – PM Peak Hour

84 Nancy Street
190433

Figure 3.2B

4 Evaluation of Future Traffic Conditions

The assessment of the future traffic conditions contained in this section includes the future traffic forecasts as well as the level of service analysis.

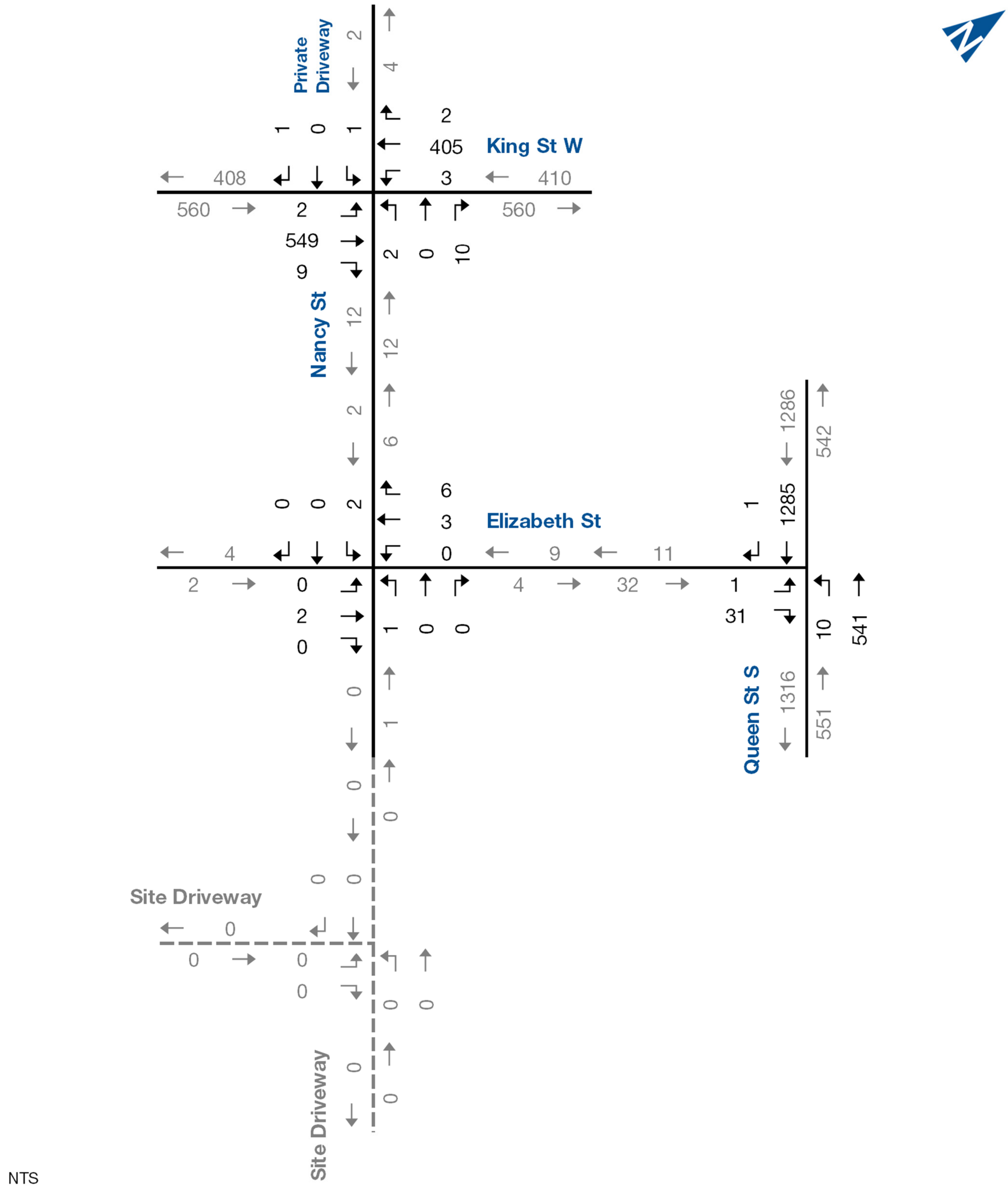
4.1 Forecast Traffic Volumes

A five-year horizon (Year 2027) beyond the anticipated build-out date (Year 2022) has been assessed. The likely future traffic volumes are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth);
- Traffic generated by adjacent future developments;
  - 50 Ann Street [6]; and
  - 232-240 King Street West[7]
- Traffic generated by the subject site.

The increased non-site traffic estimates were derived by applying a growth rate of 1.5 percent per annum to the existing traffic volumes[8]. **Appendix D** contains the detailed traffic forecast for the adjacent development applications. **Figure 4.1A-B** details the forecast background traffic volumes. **Figure 4.2A-B** details the forecast Total Traffic Volumes.

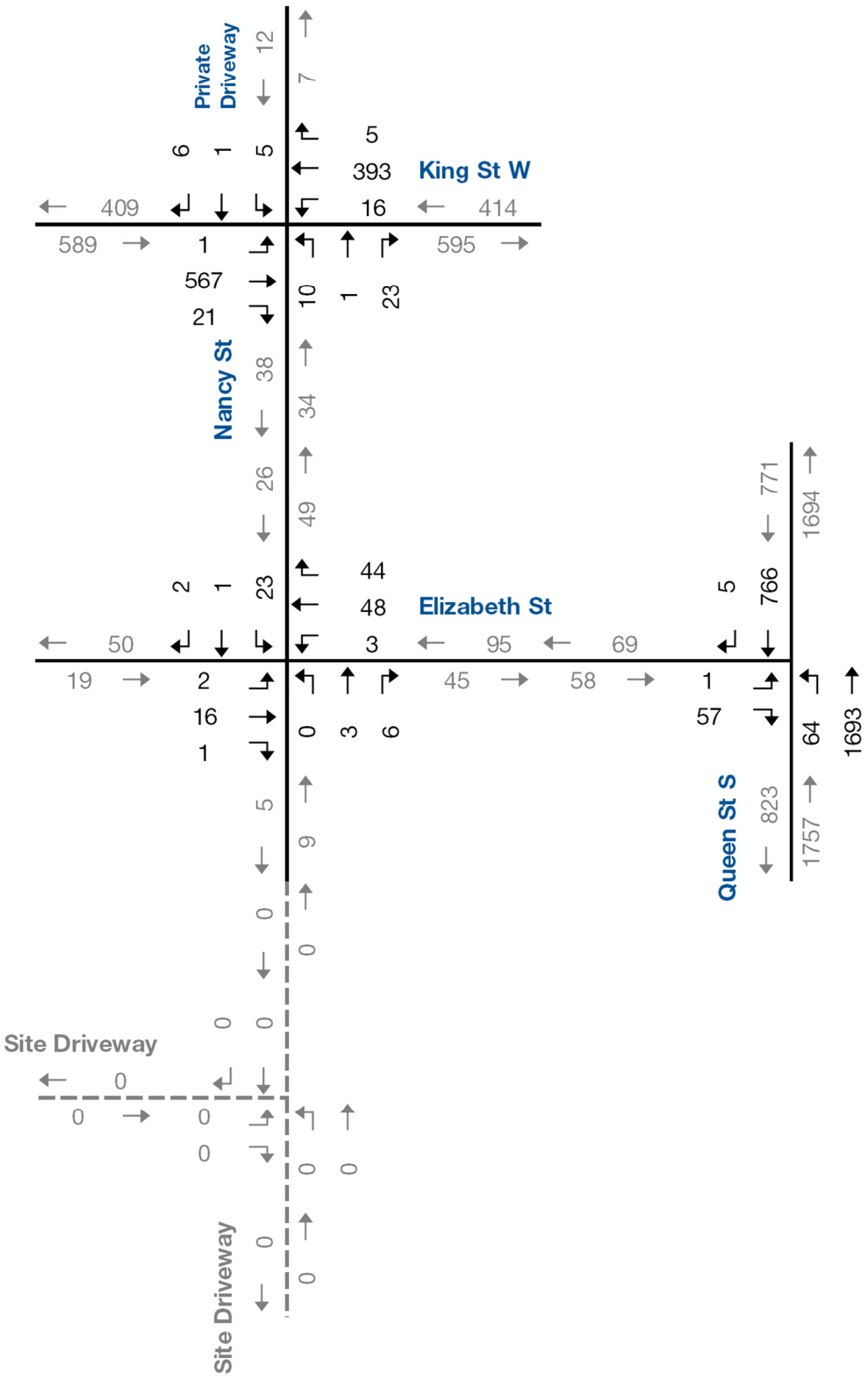
[6] 50 Ann Street Residential Development Town of Caledon Transportation Impact Study, BA Group, February 2018
[7] Site Traffic Figure provided by Town Staff.
[8] Recommended by Peel Region Staff – Appendix A



Forecast Background Traffic – AM Peak Hour

84 Nancy Street
190433

Figure 4.1A



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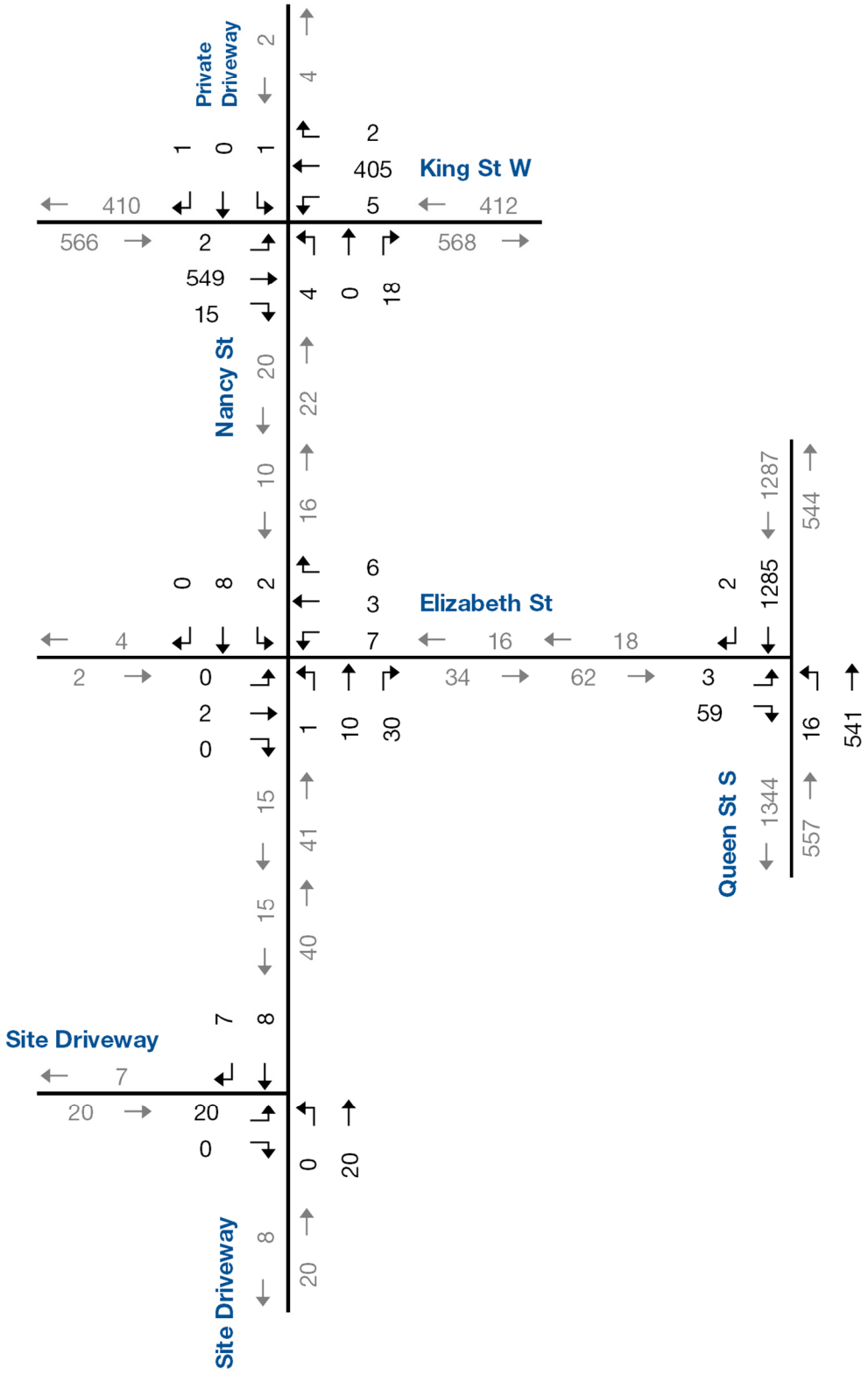
Forecast Background Traffic – PM Peak Hour

84 Nancy Street
190433

Figure 4.1B

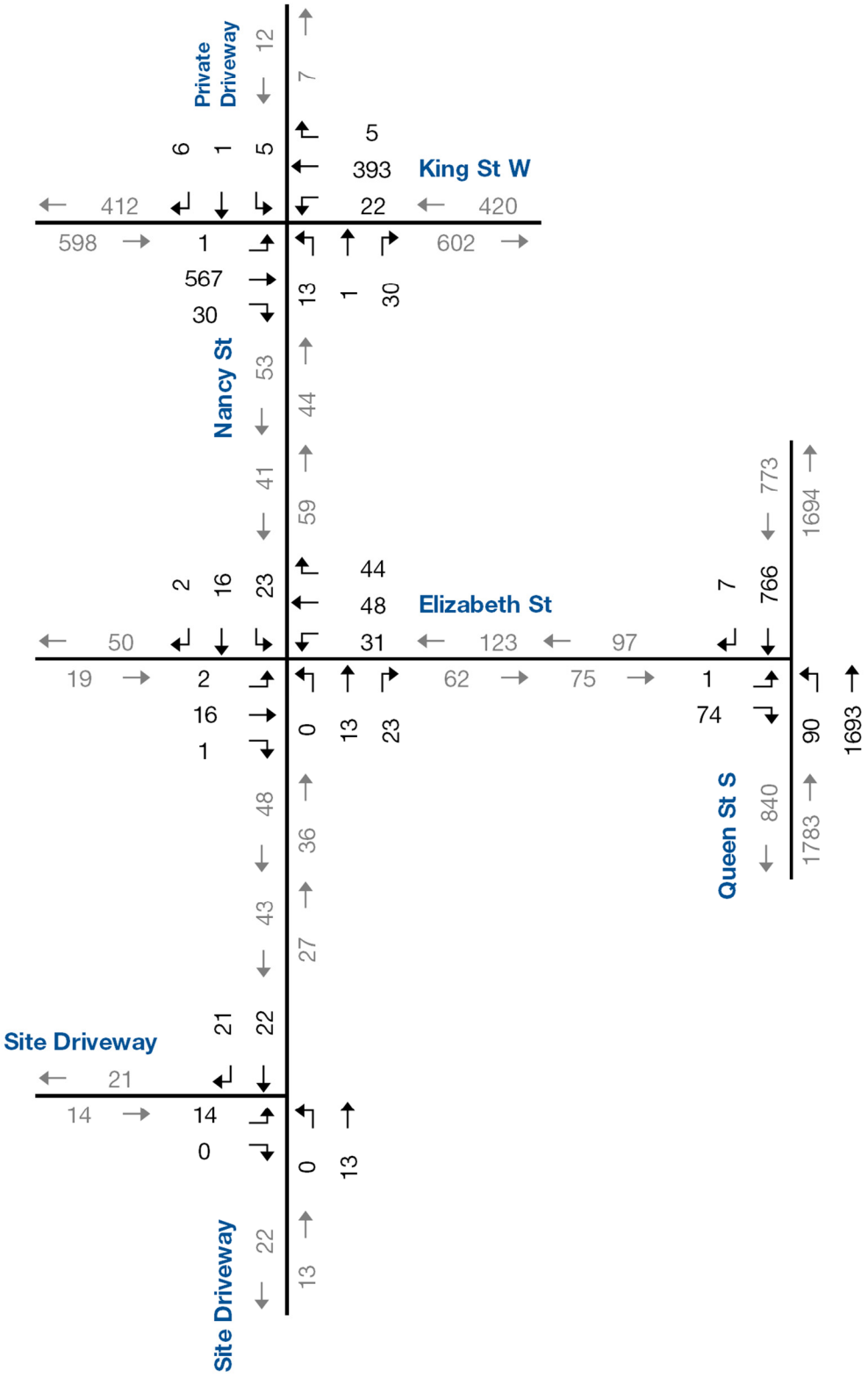


NTS

Forecast Total Traffic – AM Peak Hour

84 Nancy Street
190433

Figure 4.2A



NTS

Forecast Total Traffic – PM Peak Hour

84 Nancy Street
190433

Figure 4.2B

4.2 Background Traffic Operations

The study area intersection operations analyses for the background traffic projections followed the same methodology used for existing conditions. **Table 4.1** details the level of service conditions. No critical movements are identified at the study area intersections.

Appendix E contains the detailed Synchro 9.

TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	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	Nancy St & King St W	TWSC	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	C	>	C	
			Delay	<	0	>	0	<	0	>	0	<	13	>	13	<	16	>	16	
			V/C	<	0.00	>		<	0.00	>		<	0.03	>		<	0.01	>		
			95th	<	0	>		<	0	>		<	1	>		<	0	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			D. Util	<	0.00	>		<	0.01	>		<	0.00	>		<	0.00	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		C	C					<	A		A		A	>	A	
			Delay	<		15	15					<	1		0		0	>	0	
			V/C	<		0.08						<	0.21				0.50	>		
			95th	<		2						<	1				0	>		
PM Peak Hour	Nancy St & King St W	TWSC	LOS	<	A	>	A	<	A	>	A	<	C	>	C	<	C	>	C	
			Delay	<	0	>	0	<	1	>	1	<	16	>	16	<	17	>	17	
			V/C	<	0.00	>		<	0.02	>		<	0.10	>		<	0.04	>		
			95th	<	0	>		<	0	>		<	3	>		<	1	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			D. Util	<	0.02	>		<	0.10	>		<	0.01	>		<	0.03	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		B	B					<	A		A		A	>	A	
			Delay	<		12	12					<	2		1		0	>	0	
			V/C	<		0.11						<	0.66				0.30	>		
			95th	<		3						<	2				0	>		

MOE - Measure of Effectiveness
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
D. Util - Degree Utilization
95th - 95th Percentile Queue Length
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

4.3 Future Total Traffic Operations

The study area intersection operations analyses for the future total traffic projections followed the same methodology used for existing conditions. **Table 4.2** details the level of service conditions. No critical movements are identified at the study area intersections.

Appendix F contains the detailed Synchro 9.

TABLE 4.2: TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	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	Nancy St & King St W	TWSC	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	C	>	C	
			Delay	<	0	>	0	<	0	>	0	<	14	>	14	<	16	>	16	
			V/C	<	0.00	>		<	0.01	>		<	0.05	>		<	0.01	>		
			95th	<	0	>		<	0	>		<	1	>		<	0	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			D. Util	<	0.00	>		<	0.02	>		<	0.04	>		<	0.01	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		C	C					<	A		A		A	>	A	
			Delay	<		17	17					<	1		1		0	>	0	
			V/C	<		0.17						<	0.21				0.50	>		
			95th	<		5						<	1				0	>		
	Nancy St & Site Driveway	TWSC	LOS	<		A	A					<	A	>	A	<	A	>	A	
			Delay	<		9	9					<	0	>	0	<	0	>	0	
			V/C	<		0.02						<	0.00	>		<	0.01	>		
			95th	<		1						<	0	>		<	0	>		
PM Peak Hour	Nancy St & King St W	TWSC	LOS	<	A	>	A	<	A	>	A	<	C	>	C	<	C	>	C	
			Delay	<	0	>	0	<	1	>	1	<	17	>	17	<	18	>	18	
			V/C	<	0.00	>		<	0.02	>		<	0.13	>		<	0.04	>		
			95th	<	0	>		<	1	>		<	3	>		<	1	>		
	Nancy St & Elizabeth St	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	8	>	8	<	7	>	7	<	8	>	8	
			D. Util	<	0.02	>		<	0.14	>		<	0.04	>		<	0.05	>		
	Elizabeth St & Queen St S	TWSC	LOS	<		B	B					<	A		A		A	>	A	
			Delay	<		13	13					<	3		1		0	>	0	
			V/C	<		0.14						<	0.66				0.30	>		
			95th	<		4						<	3				0	>		
	Nancy St & Site Driveway	TWSC	LOS	<		A	A					<	A		A		A	>	A	
			Delay	<		9	9					<	0		0		0	>	0	
			V/C	<		0.01						<	0.00				0.03	>		
			95th	<		0						<	0				0	>		

MOE - Measure of Effectiveness
TWSC - Two-Way Stop Control
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95th - 95th Percentile Queue Length
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

5 Remedial Measures

5.1 Auxiliary Left-turn Lane Warrants

The need for an auxiliary left-turn lane for inbound traffic at the subject site's driveway was reviewed using the requirements in the MTO's Design Supplement for TAC Geometric Design Guide for Canadian Roads – June 2017[9]. Appendix G contains the warrant analysis. Table 5.1 summarizes the warrant analysis.

TABLE 5.1: LEFT-TURN LANE WARRANT ANALYSIS

Intersection	Directional	Analysis Period	Horizon Year		
			Existing	Background	Total
Queen St S & Elizabeth St	Northbound Left-Turn	AM	Yes - 15 m		
		PM	Yes - 15 m		Yes - 25 m
King St W & Nancy St	Eastbound Left-Turn	AM	No	Yes - 15 m	
		PM	No	Yes - 15 m	
	Westbound Left-Turn	AM	No		
		PM	No		

The warrant analysis is summarized as follows:

- Queen Street South at Elizabeth Street:
  - Northbound left-turn lane warranted under existing and background traffic conditions. Nomograph suggested storage lane length – 15 metres.
  - Northbound left-turn lane warranted under total traffic conditions. Nomograph suggested storage lane length – 25 metres.
- King Street West at Nancy Street:
  - Eastbound left-turn warranted under background traffic and total traffic conditions. Nomograph suggested storage lane length – 15 metres. Left-turning volumes are noted to be less than one (1) percent. Site traffic does not contribute to the left-turn traffic forecast.
  - Westbound left-turn not warranted.

The existing traffic volumes and forecast traffic volumes at the Queen Street South intersection with Elizabeth Street suggest the need for a northbound left-turn lane. The widening of Queen Street South within the study area may not be practical given the significant grade change

[9] MTO Geometric Design Standards for Ontario Highways, Chapter E, 1976

south of Elizabeth Street. The development of a turn lane would be a costly improvement.

Given the low levels of delay forecast to occur for the northbound approach, no changes to the existing lane geometrics at this intersection are recommended at this time.

Similarly, the provision of an eastbound left-turn lane at the intersection of King Street West with Nancy Street is not recommended due to the low volume of left-turning traffic and acceptable future traffic operations under the existing lane geometrics.

5.2 Traffic Control Improvements

The traffic analyses conducted as part of this assessment indicates that development volumes will only result in minor increases to the surrounding study area intersections. The current traffic control devices are projected to still be adequate for accommodating traffic associated with the proposed development.

5.3 Transportation Demand Management Measures

To assist in integrating the site into the surrounding neighbourhood the following Transportation Demand Management (TDM) measures should be included in the site plan and ultimately the future operation of the site.

Walking

- The On-site sidewalks connect to future sidewalks along the west side of Nancy Street. The Town of Caledon may wish to provide Ladder Crosswalk Marking at the all-way stop controlled Nancy Street intersection with Elizabeth Street. The contrast of the markings provides enhanced visibility of the crosswalk and thereby increases drivers' awareness of potential conflicts.
- The future landscaping plan consider enhancing the common amenity areas to include pedestrian amenities such as benches, seating areas and/or pedestrian scale lighting.

Cycling Infrastructure

- Convenient, secure location(s) for short-term visitor bicycle parking should be installed near building entrance for visitors. The short-term bicycle parking supply is recommended to be at least 0.05 spaces per unit.

Parking Infrastructure

- Unbundle parking costs from the cost of purchasing the units.

Wayfinding, Travel Planning, Education/Promotion

- Travel planning resources for residents (individualized marketing, active transportation maps, community resources) be provided.
- Wayfinding signage be considered in the Lobby or near main entrances.
- Contribute to building a strong TDM brand in marketing material; and
- Travel planning resources be provided with new unit purchases (transit information, active transportation maps, etc.)

The above TDM measures can assist in further mitigating the site's impact on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network that accommodates all modes of transportation.

6 Parking

6.1 Proposed Parking Supply

The site's parking supply is proposed to consist of 151 spaces within a parking structure and 31 surface parking spaces (total 182 spaces). Based on a build-out scenario of up to 159 units, the site's parking supply per unit is noted to be 1.00 spaces per unit while visitor requirements is noted to be 0.15 spaces per unit. The parking supply may be adjusted to reflect the final unit count.

6.2 Zoning By-law Requirement

The Town of Caledon's Zoning By-law[10] parking requirement for the subject site is 1.50 parking spaces per dwelling unit plus 0.25 parking spaces per unit for visitor parking in a designated visitor parking area. **Table 6.1** details the Zoning By-law parking requirement. Approximately 279 parking spaces are required to satisfy the Zoning By-law parking requirement. Based on the current noted parking supply, the site's parking supply is considered deficient.

TABLE 6.1: ZONING BY-LAW PARKING REQUIREMENT

Land Use	User	Rate	Requirement
159 Condominium Units	Occupant	1.50	239
	Visitor	0.25	40
Total		**1.75**	**279**

6.3 Parking Survey Data – Bolton

The approved residential condominium development located at 50 Ann Street, approximately 500 metres, north of the subject site has been approved with a parking supply ratio of 1.10 spaces per unit. The ratio was developed through local parking demand survey data.

The subject site is proposed to be developed as an adult lifestyle residential development with up to 159 units. The units will be marketed towards senior adults wishing to downsize their home while remaining independent. Residents may or may not be retired. Establishing a parking supply greater than what is approved for the residential condominium at 50 Ann Street (1.10 spaces per unit) is reasonable and should can be supported by the Town of Caledon.

[10] By-law 2006-50 – Section 5 Parking, Loading & Delivery Standards

6.4 Parking Survey Data

Paradigm has collected parking data for mid-rise condominium units in the City of Burlington. The site consists of 78 units with a structured parking supply of 111 spaces (1.42 spaces per unit), Table 6.3 details the observed parking demand data over the course of four (4) separate week days and the following is noted:

- Overall parking demands were observed to range from 0.86 to 1.07 spaces per unit.
  - Occupant parking demands were observed to range from 0.69 to 0.93 spaces per unit. Average occupant parking demand of 0.79 spaces per unit.
  - Visitor parking demands were observed to range from 0.10 to 0.24 spaces per unit. Average occupant parking demand of 0.16 spaces per unit.

TABLE 6.3: PARKING DEMAND SURVEY DATA

Land Use	Observation	Parking Demand		
		Occupant	Visitor	Combined
Mid-Rise 1284 Guelph Line 78 Units	Day 1	0.69	0.17	0.86
	Day 2	0.68	0.24	0.92
	Day 3	0.87	0.10	0.97
	Day 4	0.93	0.14	1.07
	Average	**0.79**	**0.16**	**0.96**

Appendix H contains the mid-rise unit parking demand data. The mid-rise parking demand data is considered conservative as the units are condominium units and not specific to adult lifestyle units.

6.5 Recommended Parking Supply

In consideration of the local parking demand data and the mid-rise condominium parking demand data, it is recommended that the site's parking supply be designed to provide at least 1.15 spaces per unit.

To support this ratio, occupant parking for each unit should be unbundled from the cost of the unit and parking for residents be limited to no more than 1.00 space per unit.

7 Conclusions and Recommendations

7.1 Conclusions

The main findings and conclusions of this study are as follows:

- **Study Area:** The intersections that form the study area include the Nancy Street intersections with King Street West and Elizabeth Street and the intersection of Elizabeth Street at Queen Street South.
- **Existing Traffic Conditions:** The intersections within the study area are currently operating with acceptable levels of service during the AM and PM peak hours.
- **Forecast Traffic:** The forecast traffic volumes near the subject site have been assessed for an Opening date horizon (Year 2022) and five years (Year 2027) beyond the opening date. The projected traffic volumes near the subject site are estimated to consist of:
  - Generalized background traffic growth;
  - Build-out of two (2) adjacent developments; and
  - Traffic generated by the subject site.
- **Background Traffic Conditions:** The intersections within the study area are forecast to continue to operate with acceptable levels of service during the AM and PM peak hours.
- **Parking:** The proposed parking supply for the subject site will consist of 182 spaces and results in a theoretical shortfall of 97 parking spaces in comparison to the Town of Caledon Zoning By-law parking requirements. Confirmed through parking utilization surveys, the 182 spaces will be sufficient to accommodate the anticipated parking demand at the proposed parking supply rate of 1.15 spaces per unit.
- **Transportation Demand Management:** The site concept plan includes TDM measures intended to assist in mitigating the site's transportation and parking impacts.
- **Development Generated Traffic:** The subject site is estimated to generate approximately 54 new AM peak hour trips and approximately 70 new PM peak hour trips
- **Total Traffic Conditions:** The intersections within the study area are forecast to continue to operate with acceptable levels of service during the AM and PM peak hours.

- **Remedial Measures:** No changes to the existing form of traffic control at the study area intersections is necessary to accommodate background growth or development related traffic. A northbound left-turn lane at the Queen Street South intersection with Elizabeth Street is warranted under existing conditions and subsequently warranted under future traffic conditions as well. However, the existing grade and retaining walls may be cost prohibitive to widening the Queen Street cross section at this location. From an operational perspective, the existing approach configuration is forecast to continue operating at an acceptable level of service under future traffic conditions.

7.2 Recommendations

Based on the findings of this study, the following is recommended:

- The proposed driveway connection to the external road network shall operate under two-way stop control.
- The TDM measures outlined in **Section 3.2** and **Section 5.4** be included in the future design of the subject site. Some elements of the TDM plan can be designed directly into the site plan while other elements can only be achieved after occupancy. The implementation of the TDM plan should assist in further reducing on-site parking demand.
- The site's parking supply be adjusted to reflect the final unit count. A parking supply ratio of at least 1.15 spaces per unit should be utilized for designing the final site plan.
- The occupant parking for each unit is recommended to be unbundled from the cost of the unit and the parking supply for residents be limited to no more than 1.00 space per unit.

Appendix A

Pre-Study Consultation

5000 Yonge Street, Suite 1901
Toronto, ON M2N 7E9
p: 416.479.9684
f: 1.855.764.7349

www.ptsl.com

11 May 2018
Project: 180126

Steve Ganesh
Transportation Planning
Region of Peel
905-791-7800 x 7824
Steve.Ganesh@peelregion.ca

Arash Olia Ph.D., P.Eng.
Coordinator, Transportation Development
Town of Caledon
905.584.2272 x. 4073
arash.olia@Caledon.ca

Dear Mr. Ganesh & Mr. Olia

RE: TERMS OF REFERENCE TRANSPORTATION IMPACT STUDY & PARKING STUDY – 84 NANCY STREET – TOWN OF CALEDON (BOLTON)

Paradigm Transportation Solutions Limited is pleased to submit these Terms of Reference for the Transportation Impact Study (TIS) and Parking Study for the proposed development of 84 Nancy Street in the Town of Caledon (Bolton).

Project Understanding

The site is located at 84 Nancy Street in Bolton. The current development concept includes a 9-storey residential building with 140 units intended to be marketed as a 50+ adult lifestyle community. The site's parking supply is noted to be 153 parking spaces with approximately 47 spaces provided at grade. The remaining spaces are to be contained within a 2-storey parking structure.

Vehicular access is proposed by a driveway connection to the terminus of Nancy Street. In assessing the transportation impacts, we intend to analyze the operation of the following intersections, subject to the review agencies concurrence:

- Nancy Street and Elizabeth Street;
- King Street West and Nancy Street; and
- Queen Street South and Elizabeth Street.

We will complete the TIS in accordance with the Region of Peel Transportation Impact Study - Terms of Reference and Town of Caledon Transportation Impact Studies - Terms of Reference and Guidelines as well as any further direction provided by the review agencies staff during pre-study consultation.

Work Plan

- **Task 1 - Pre-Study Consultation**: We will contact the review agencies (Peel Region and Town of Caledon) to confirm and refine the study scope and assumptions prior to undertaking the study.
- **Task 2- Data Collection**: Through pre-study consultation with the review agencies, we will request available traffic counts, traffic signal timings, background growth rates, relevant background reports, and any other information about the study area pertinent to the assessment (e.g., other development applications in the vicinity). If the review agency does not have traffic counts collected within the past two years, we will arrange for 8-hour traffic counts to be conducted on a weekday at the study area intersections.

  We will undertake a site visit to review roadway conditions in the immediate study area. We will also inventory the current available on-street parking within convenient walking distance of the development (250 metres) and other transportation related infrastructure such as pedestrian and cycling amenities and transit service.
- **Task 3- Traffic Forecasting**: We will request confirmation of the opening year. According to the Region and Town's Terms of Reference and Guidelines, we have assumed that we will be requested to develop traffic forecasts for the weekday AM and PM peak hours for a single future horizon year representing five (5) years from full build-out. The components of the traffic forecasts are as follows:
  - **Existing (Base Year) Traffic** - We will develop Existing vehicle traffic volumes for the AM and PM peak hours from available traffic counts for the study area intersections and site driveways.
  - **Future (Five-Year Horizon) Background Traffic** - We will estimate Future Background vehicle traffic volumes for the AM and PM peak hours by applying a growth rate to the Existing volumes and adding anticipated trips from any nearby approved developments identified in Task 1.
  - **Future (Five-Year Horizon) Total Traffic** - We will forecast the AM and PM peak hour vehicle traffic volumes generated by the proposed development based on a combination of data collected by Paradigm or the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) as appropriate. The site vehicle trips will be distributed to the adjacent road network based on existing traffic patterns and added to the Future Background estimates to produce Future Total traffic volumes for each horizon year.
- **Task 4 - Operational Analyses**: We will evaluate the operation of the study area intersections for the Existing, Future Background and Future Total AM and PM peak hour traffic conditions for each horizon year. The operational analyses will assess volume-to-capacity (v/c) ratios, Level of Service (LOS) and queuing conditions.

  Based on the analysis results, we will identify any deficiencies, as well as the net impact of the proposed development on the study area road network. The need for road improvements (e.g., provision of auxiliary turn lanes) and/or modifications to traffic control devices (e.g., addition of traffic control signals) to address any deficiencies will be determined. An assessment of whether these measures are required due to non-site traffic (i.e. Existing or Future Background) or the increase in traffic resulting from the proposed development will be completed.

- **Task 5 – Development Driveway:** The development driveway location will be evaluated in terms of capacity, safety and adequacy of queue storage capacity, and pedestrian safety. The driveway will be checked for conflicts with utilities, other driveway locations (including those of other sites), bus stop locations, on-street weaving problems, pedestrian/ bicycle safety, etc. Sightlines will be evaluated to ensure safe conditions in accordance with accepted standards where these are affected by the site design.
- **Task 6 – Parking Assessment:** We will review previous parking studies that we have completed and review the Institute of Transportation Engineers – Parking Generation – 4th Edition. We will also examine TTS data for the area and consider the percentage of trips made by alternative modes of travel.

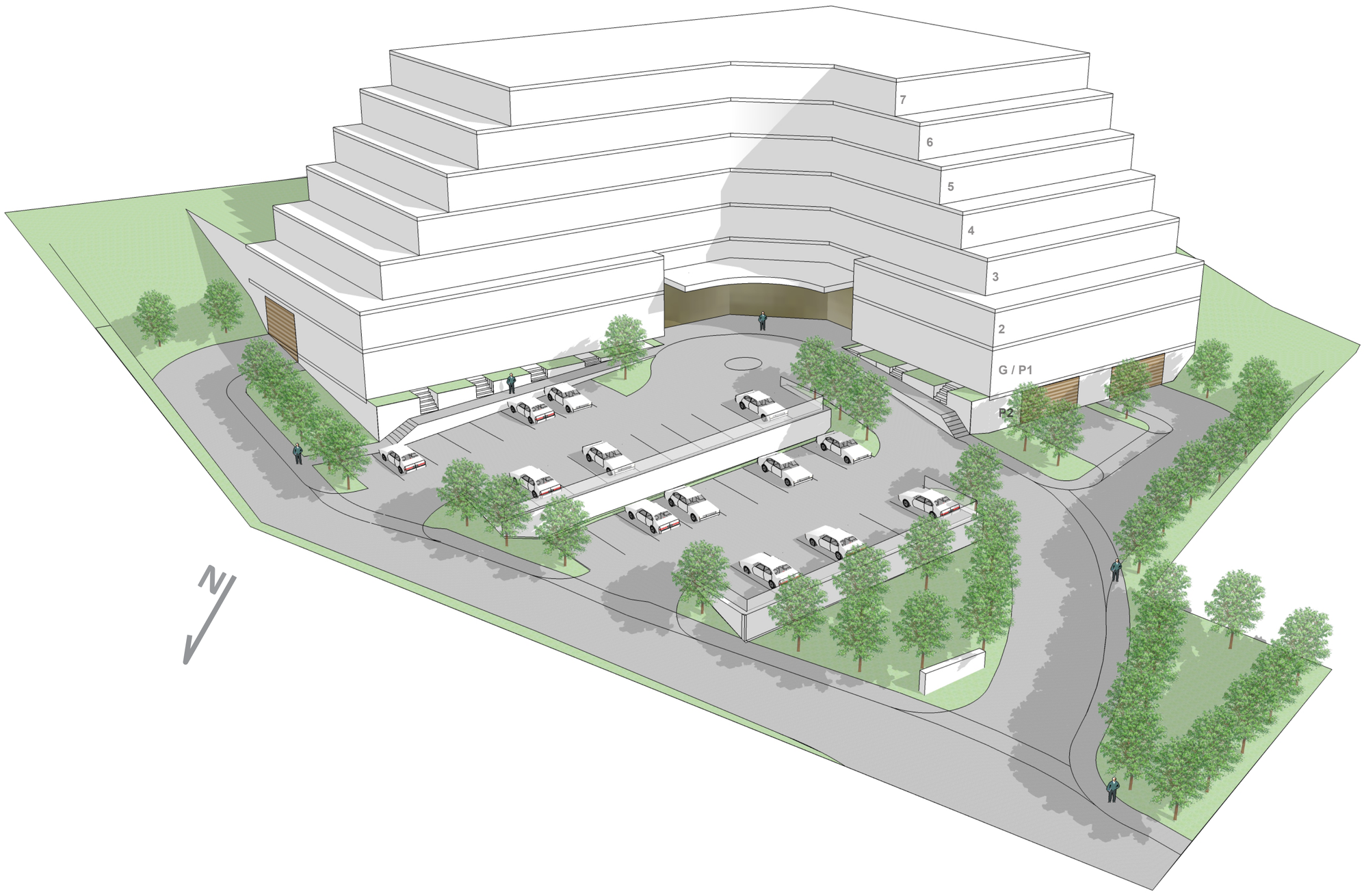
  To accurately compare parking supply to the forecast demand, Paradigm has an extensive number of surveys on file for residential developments. We will utilize these existing parking surveys to demonstrate the adequacy of the site's parking supply for both the occupants and visitors.
- **Task 7 – Report and Recommendations**: We will prepare and submit a report documenting the study findings and conclusions and providing recommendations regarding the proposed development from a transportation perspective. The final report will include appendices containing relevant traffic data as well as the detailed output generated by the operational analysis software.

you have any questions, please contact me at (905) 381-2229 x103 or by email at selkins@ptsl.com.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

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



84 Nancy St.

Bolton, ON

March 2, 2018 **Not to Scale**

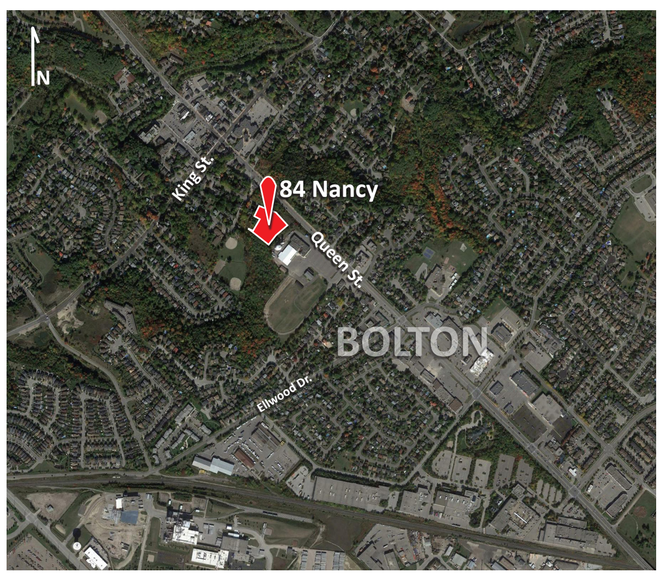
Concept Site Plan and Massing Model

MARKIN CONSULTING
416-988-4081 | pmarkine@gmail.com

Drawn by: PM

Site Area: 7,780m² / 83,750sf / 1.9ac
Parking Spaces: 150

Floor	Bldg Area (Incl. Pkg.)	GFA (Excl.Pkg.)
P2:	27,000sf	8,200sf
Ground/P1:	27,000sf	8,200sf
2nd Floor:	27,000sf	27,000sf
3rd Floor:	24,500sf	24,500sf
4th Floor:	23,000sf	23,000sf
5th Floor:	21,500sf	21,500sf
6th Floor:	20,000sf	20,000sf
7th Floor:	18,500sf	18,500sf
Total:	**188,500sf (x2.25)**	**150,900sf (x1.8)**



Scott Catton

From: Arash Olia <Arash.Olia@caledon.ca>
Sent: Monday, 14 May, 2018 11:06 AM
To: Scott Catton
Cc: Eric Chan
Subject: RE: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Hi Scott,

Thanks for your email. King Street is under the jurisdiction of the Region of Peel, and the Region should also confirm the Terms of Reference. From the Town's perspective, please see my comments below:

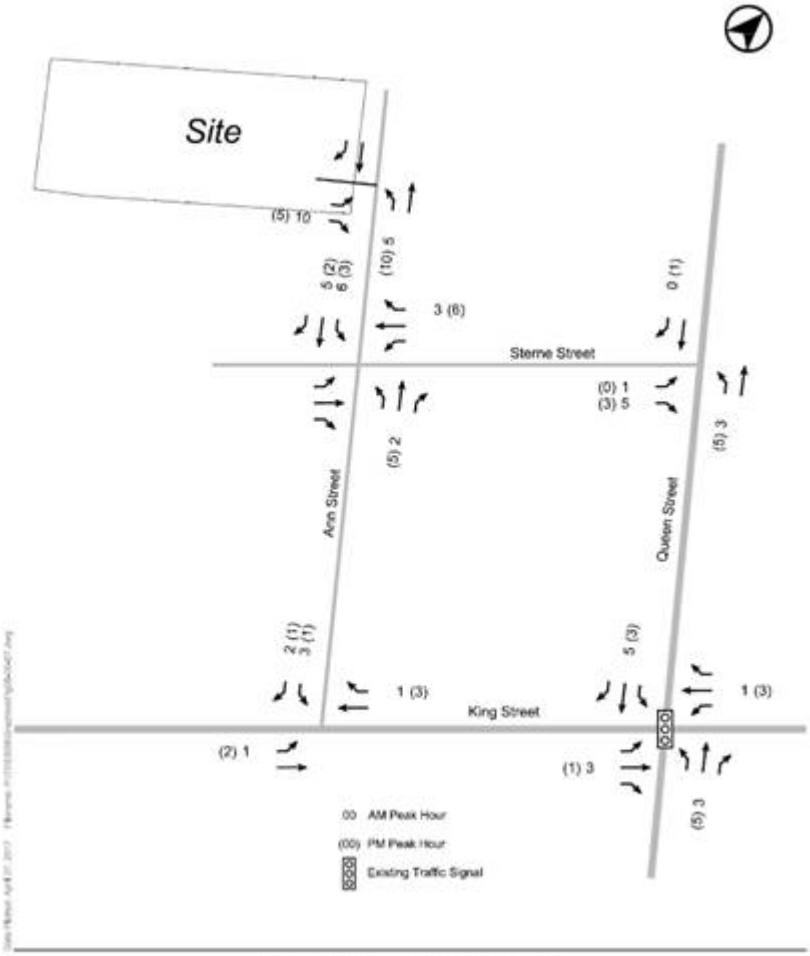
1. Include the following background studies in your TIS. I have attached the Sites Traffic Volumes.
    a. 50 Ann Street
    b. 232-240 King Street West
2. The potential for promoting the sustainable transportation including the connectivity of the proposed development to the existing facilities should be investigated and provided in the TIS.

50 ANN STREET
RESIDENTIAL DEVELOPMENT
TOWN OF CALEDON

Transportation Impact Study

Prepared For: Brookfield Residential (Ontario) Limited

April 27, 2017



SITE TRAFFIC VOLUMES

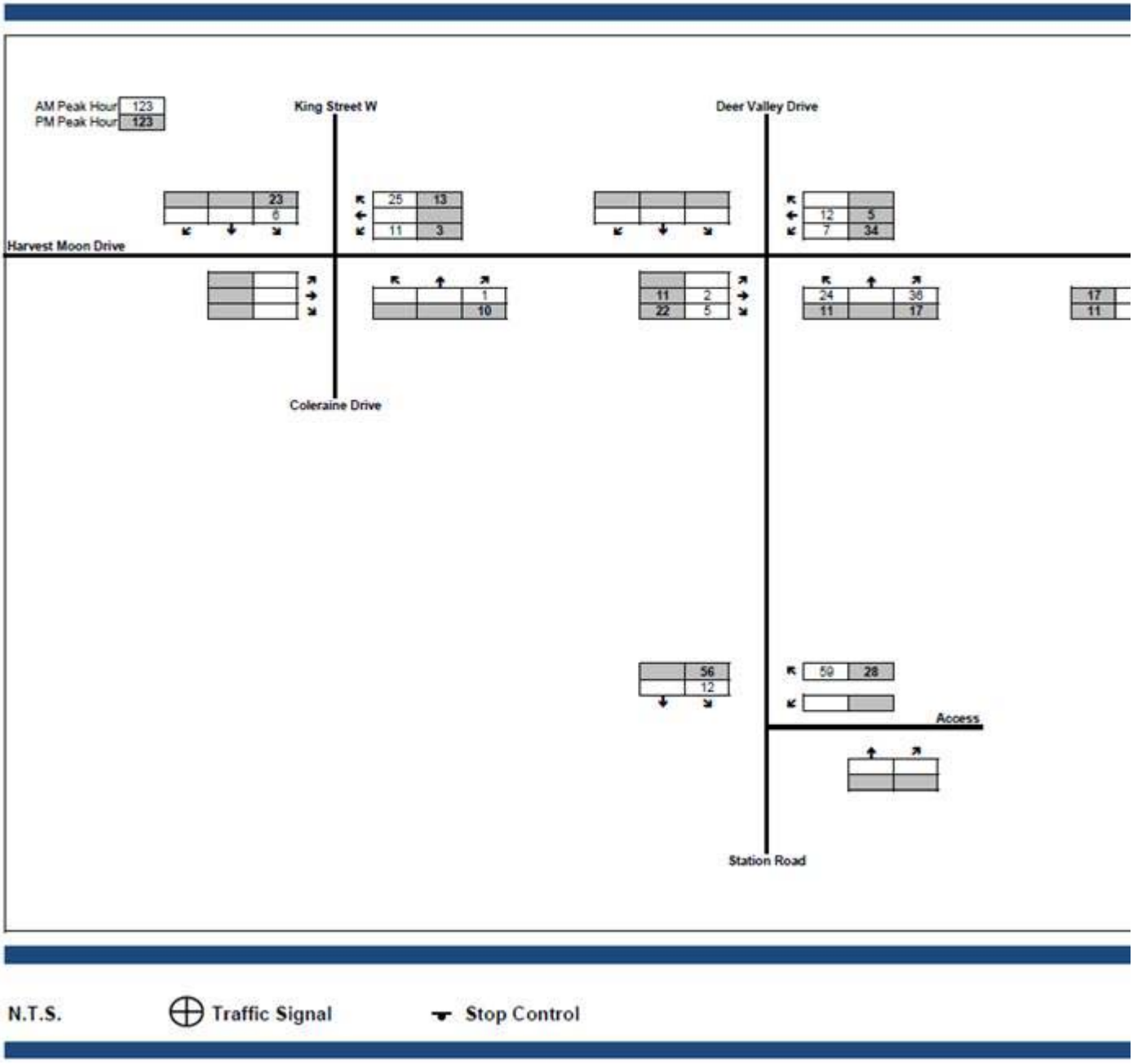
232 – 240 King Street W –
Bolton, ON
Traffic Impact Study

Traffic Impact Study in support of the proposed residential and retirement residence development

Stantec

Prepared for:
King Station Facility Inc.

Prepared by:
Stantec Consulting Ltd.



Should you have any questions, please let me know.

Thanks,
Arash

Arash Olia, Ph.D., P.Eng.
Coordinator, Transportation Development, Transportation
Finance & Infrastructure Services

Office: 905.584.2272 x.4073

Email: arash.olia@caledon.ca

Town of Caledon | www.caledon.ca | www.visitcaledon.ca | Follow us @YourCaledon

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From: Scott Catton [mailto:scatton@ptsl.com]
Sent: Friday, May 11, 2018 10:39 AM
To: Steve.Ganesh@peelregion.ca; Arash Olia
Subject: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Good morning Steve & Arash,
We've been retained to conduct the Transportation Impact Study and Parking Study for the proposed development of 84 Nancy Street in the Town of Caledon (Bolton). The site is proposed to be developed as a 50+ Adult Lifestyle Community with approximately 140 units. Our proposed terms of reference for the study along with the current site concept plan can be found attached.

Would you kindly review the proposed terms of reference for the study and provide me with comment at your earliest convenience?

If there is a more appropriate person at the Town/Region to review and comment on the study TOR, Kindly forward this email to them. Thank you.

If you have any questions or require any additional information, please feel free to contact me. Thank you.

Scott Catton, Dipl. T., C.E.T., MITE
Transportation Engineering Technologist

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300, Waterloo ON N2J 1N8
p: 905.381.2229 x302
m: 519.498.2797
e: scatton@ptsl.com
w: www.ptsl.com

Scott Catton

From: Shan, Rosalie <rosalie.shan@peelregion.ca>
Sent: Friday, 25 May, 2018 10:12 AM
To: Scott Catton
Cc: arash.olia@Caledon.ca
Subject: RE: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Categories: Comments

Hi Scott,

Now I have a chance to review the proposed terms of reference and we agree with your study scope. For background data inquiries, please contact – Region of Peel (905)791-7800

- Transportation Planning – Gordon Hui ext.4549 to obtain
  - Growth rate along Highway 50
- Traffic Operations Supervisor – Damian Jamroz ext.7856 to obtain the most recent TMCs and/or average annual daily traffic (AADT)
- Traffic Signal and Street Lighting Supervisor - Rick Laing ext.7859 to obtain traffic signal timing parameters and ensure that the information includes the appropriate walk/don't walk splits, recall modes and offsets.

In addition, we will request a left turn lane warrant analysis at the intersection of Highway 50 and Elizabeth Road.

Please let me know if you need more information on this. Thank you.

Regards,

Rosalie Shan

Technical Analyst, Traffic Development and Permits
Transportation Division, Public Works
Region of Peel

P: (905)791-7800 ext. 7999
E: Rosalie.Shan@peelregion.ca

From: Scott Catton [mailto:scatton@ptsl.com]
Sent: May 25, 2018 9:50 AM
To: Shan, Rosalie
Cc: arash.olia@Caledon.ca; Carrick, Sean
Subject: RE: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Good morning Rosalie
Just following up on the review of the TOR for the study.

If you would kindly provide comment, it would be appreciated. Thank you.

Scott Catton, Dipl. T., C.E.T., MITE
Transportation Engineering Technologist

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300, Waterloo ON N2J 1N8
p: 905.381.2229 x302
m: 519.498.2797
e: scatton@ptsl.com
w: www.ptsl.com

From: Carrick, Sean <sean.carrick@peelregion.ca>
Sent: Tuesday, 15 May, 2018 11:54
To: Scott Catton <scatton@ptsl.com>
Cc: arash.olia@Caledon.ca; Shan, Rosalie <rosalie.shan@peelregion.ca>
Subject: RE: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Hi Scott,

Thanks for reaching out to us, Rosalie will be reviewing the TOR and will be providing comments

Please feel free to give Rosalie (x7999) or myself a shout if you have any questions

Sean

Sean Carrick, C.E.T.
Supervisor, Traffic Development & Permits
Transportation Division
Public Works, Region of Peel

Tel: (905) 791-7800 ext. 7868
Fax: (905) 791-1442

From: Scott Catton [mailto:scatton@ptsl.com]
Sent: May 11, 2018 10:39 AM
To: Ganesh, Steve; arash.olia@Caledon.ca
Subject: 180126 (84 Nancy St TIS & Parking Study) Terms of Reference

Good morning Steve & Arash,
We've been retained to conduct the Transportation Impact Study and Parking Study for the proposed development of 84 Nancy Street in the Town of Caledon (Bolton). The site is proposed to be developed as a 50+ Adult Lifestyle Community with approximately 140 units. Our proposed terms of reference for the study along with the current site concept plan can be found attached.

Would you kindly review the proposed terms of reference for the study and provide me with comment at your earliest convenience?

If there is a more appropriate person at the Town/Region to review and comment on the study TOR, Kindly forward this email to them. Thank you.

If you have any questions or require any additional information, please feel free to contact me. Thank you.

Scott Catton, Dipl. T., C.E.T., MITE
Transportation Engineering Technologist

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300, Waterloo ON N2J 1N8
p: 905.381.2229 x302
m: 519.498.2797
e: scatton@ptsl.com
w: www.ptsl.com

<180126 (84 Nancy St TIS Parking) - TOR - 2018-02-11.pdf>

<180126 (84 Nancy St Site Plan) - 2018-03-02.pdf>

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Scott Catton

From: Christine Bowness
Sent: Tuesday, 5 June, 2018 10:19 AM
To: Scott Catton
Subject: FW: 180126 Growth Rate Data

Growth Rate below.

Christine Bowness
Data Collection Coordinator

Paradigm Transportation Solutions Limited
p: 519.896.3163 x403

From: Wang, Kaili <kaili.wang@peelregion.ca>
Sent: June 5, 2018 10:09 AM
To: Christine Bowness <cbowness@ptsl.com>
Cc: Hui, Gordon <gordon.hui@peelregion.ca>
Subject: RE: Growth Rate Data

Hi Christine,

Please use 1.5% growth rate for Queen St. South at King Street West for horizon year 2027.

Regards,

Kaili Wang
Transportation System Planning
Public Works, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton ON L6T 4B9
905-791-7800, ext. 4810

From: Christine Bowness [mailto:cbowness@ptsl.com]
Sent: May 31, 2018 3:58 PM
To: Wang, Kaili
Cc: Hui, Gordon
Subject: RE: Growth Rate Data

The horizon year is 2027.

Thanks,

Christine Bowness
Data Collection Coordinator

Paradigm Transportation Solutions Limited
p: 519.896.3163 x403

From: Wang, Kaili <kaili.wang@peelregion.ca>
Sent: May 31, 2018 3:40 PM
To: Christine Bowness <cbowness@ptsl.com>
Cc: Hui, Gordon <gordon.hui@peelregion.ca>
Subject: RE: Growth Rate Data

Hi Christine,

I am handling your growth rate request. Can you provide me the horizon year in your analysis so that I can provide growth rate accordingly?

Regards,

Kaili Wang
Transportation System Planning
Public Works, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton ON L6T 4B9
905-791-7800, ext. 4810

From: Hui, Gordon
Sent: May 31, 2018 2:56 PM
To: Wang, Kaili
Subject: FW: Growth Rate Data

Gordon Hui
W: 905-791-7800 x4549
C: 416-805-8040

From: Christine Bowness [mailto:cbowness@ptsl.com]
Sent: May 31, 2018 2:54 PM
To: Hui, Gordon
Subject: Growth Rate Data

Good afternoon,

Are you able to provide the growth rate along Queen Street South (Highway 50) near he King Street West intersection?

If you are, what is the cost? I can call with my credit card information.

The data is to be used for the purposes of completing a Transportation Impact Study which has been scoped with Rosalie Shan.

Regards,

Christine Bowness
Data Collection Coordinator

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300, Waterloo ON N2J 1N8
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Appendix B

Existing Count Data

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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

Count Name: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018

Turning Movement Data

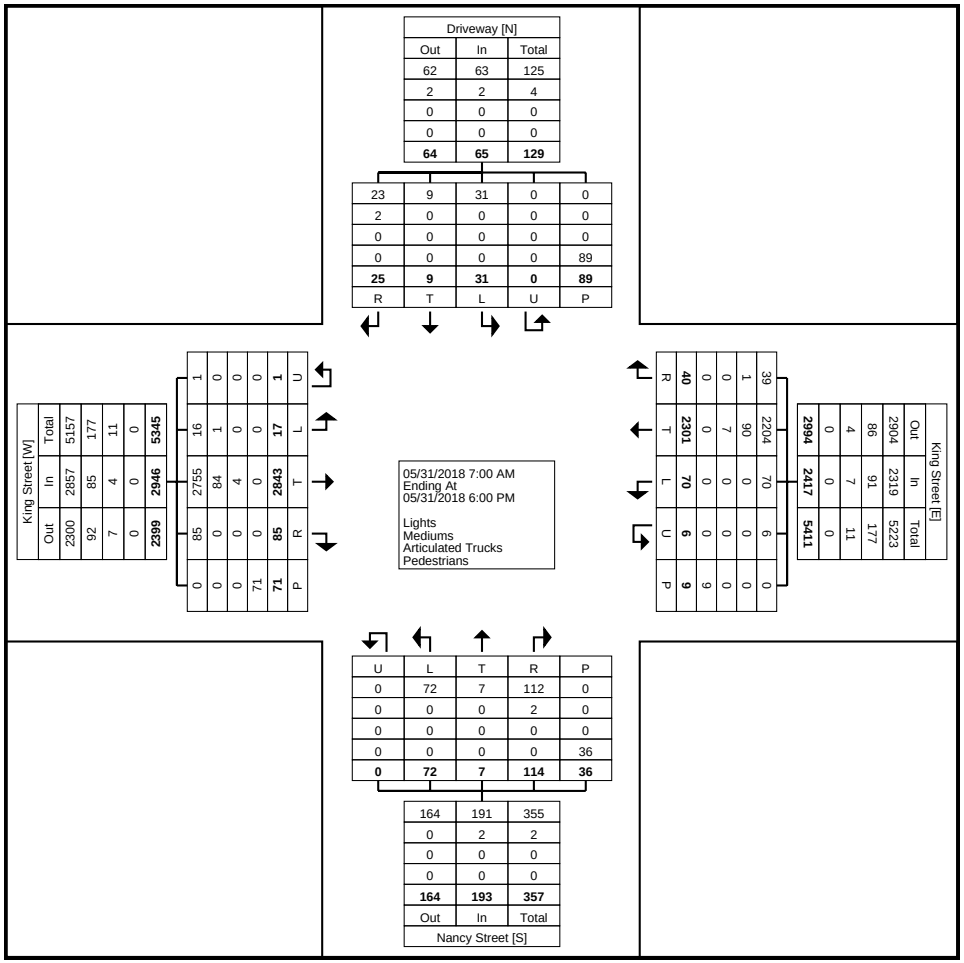
Start Time	King Street Eastbound						King Street Westbound						Nancy Street Northbound						Driveway Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	82	3	0	0	85	1	54	0	0	0	55	2	0	1	0	1	3	0	0	0	0	0	0	143
7:15 AM	0	80	1	0	0	81	0	75	0	0	0	75	0	0	1	0	0	1	0	0	0	0	0	0	157
7:30 AM	1	102	1	0	0	104	0	79	1	0	0	80	1	0	1	0	0	2	0	0	0	0	3	0	186
7:45 AM	0	100	1	0	0	101	1	81	1	0	0	83	0	0	1	0	2	1	0	0	0	0	1	0	185
Hourly Total	1	364	6	0	0	371	2	289	2	0	0	293	3	0	4	0	3	7	0	0	0	0	4	0	671
8:00 AM	0	120	0	0	0	120	1	83	0	2	0	86	1	0	3	0	0	4	0	0	1	0	3	1	211
8:15 AM	1	112	6	0	0	119	1	101	0	0	0	102	0	0	4	0	0	4	1	0	0	0	1	1	226
8:30 AM	0	90	4	0	3	94	4	81	1	0	0	86	1	0	1	0	0	2	0	0	0	0	0	0	182
8:45 AM	0	70	3	0	0	73	4	81	0	0	0	85	1	0	3	0	0	4	1	0	0	0	1	1	163
Hourly Total	1	392	13	0	3	406	10	346	1	2	0	359	3	0	11	0	0	14	2	0	1	0	5	3	782
9:00 AM	0	77	2	0	3	79	0	74	1	0	0	75	5	0	1	0	0	6	0	0	0	0	2	0	160
9:15 AM	1	71	2	0	1	74	1	61	0	0	0	62	3	0	1	0	1	4	0	0	0	0	1	0	140
9:30 AM	0	66	2	0	0	68	1	55	1	0	0	57	3	0	4	0	0	7	1	0	0	0	6	1	133
9:45 AM	1	64	2	0	12	67	0	62	0	0	0	62	0	0	2	0	1	2	0	0	0	0	2	0	131
Hourly Total	2	278	8	0	16	288	2	252	2	0	0	256	11	0	8	0	2	19	1	0	0	0	11	1	564
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	68	3	0	1	71	0	48	1	0	0	49	3	1	2	0	0	6	0	0	0	0	1	0	126
11:15 AM	1	50	1	0	2	52	2	41	1	0	0	44	2	0	1	0	2	3	2	0	1	0	5	3	102
11:30 AM	0	60	0	0	4	60	3	46	2	2	0	53	2	0	6	0	1	8	1	0	1	0	2	2	123
11:45 AM	1	88	2	0	3	91	2	56	0	0	0	58	3	0	4	0	2	7	0	0	0	0	6	0	156
Hourly Total	2	266	6	0	10	274	7	191	4	2	0	204	10	1	13	0	5	24	3	0	2	0	14	5	507
12:00 PM	2	68	3	0	1	73	3	64	2	0	1	69	2	0	7	0	2	9	1	0	1	0	1	2	153
12:15 PM	1	70	2	0	0	73	1	35	6	1	2	43	0	0	4	0	0	4	3	2	2	0	0	7	127
12:30 PM	0	75	2	0	5	77	1	52	0	1	2	54	2	0	3	0	3	5	5	0	0	0	5	5	141
12:45 PM	0	65	2	0	2	67	5	49	2	0	1	56	4	1	1	0	1	6	2	0	1	0	2	3	132
Hourly Total	3	278	9	0	8	290	10	200	10	2	6	222	8	1	15	0	6	24	11	2	4	0	8	17	553
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	82	1	1	2	85	4	77	1	0	1	82	5	2	11	0	0	18	0	1	0	0	2	1	186
3:15 PM	0	77	0	0	2	77	2	98	1	0	0	101	0	0	6	0	4	6	1	0	2	0	4	3	187
3:30 PM	1	101	3	0	4	105	4	80	6	0	0	90	4	0	3	0	1	7	1	1	3	0	2	5	207
3:45 PM	1	96	6	0	5	103	4	64	0	0	0	68	7	1	6	0	3	14	1	1	3	0	2	5	190
Hourly Total	3	356	10	1	13	370	14	319	8	0	1	341	16	3	26	0	8	45	3	3	8	0	10	14	770
4:00 PM	1	113	3	0	1	117	2	85	4	0	1	91	1	0	6	0	1	7	3	1	2	0	1	6	221
4:15 PM	2	98	5	0	5	105	2	90	4	0	1	96	1	0	6	0	2	7	3	1	2	0	5	6	214
4:30 PM	1	103	2	0	2	106	5	89	1	0	0	95	3	1	1	0	0	5	1	1	1	0	12	3	209
4:45 PM	0	133	6	0	0	139	4	79	1	0	0	84	4	1	7	0	0	12	0	0	3	0	4	3	238
Hourly Total	4	447	16	0	8	467	13	343	10	0	2	366	9	2	20	0	3	31	7	3	8	0	22	18	882

5:00 PM	0	128	6	0	1	134	1	84	0	0	0	85	3	0	8	0	0	11	1	1	1	0	3	3	233
5:15 PM	0	112	2	0	1	114	5	97	2	0	0	104	0	0	3	0	7	3	1	0	0	0	3	1	222
5:30 PM	1	124	4	0	6	129	4	85	1	0	0	90	2	0	2	0	0	4	2	0	1	0	5	3	226
5:45 PM	0	98	5	0	5	103	2	95	0	0	0	97	7	0	4	0	2	11	0	0	0	0	4	0	211
Hourly Total	1	462	17	0	13	480	12	361	3	0	0	376	12	0	17	0	9	29	4	1	2	0	15	7	892
Grand Total	17	2843	85	1	71	2946	70	2301	40	6	9	2417	72	7	114	0	36	193	31	9	25	0	89	65	5621
Approach %	0.6	96.5	2.9	0.0	-	-	2.9	95.2	1.7	0.2	-	-	37.3	3.6	59.1	0.0	-	-	47.7	13.8	38.5	0.0	-	-	-
Total %	0.3	50.6	1.5	0.0	-	52.4	1.2	40.9	0.7	0.1	-	43.0	1.3	0.1	2.0	0.0	-	3.4	0.6	0.2	0.4	0.0	-	1.2	-
Lights	16	2755	85	1	-	2857	70	2204	39	6	-	2319	72	7	112	0	-	191	31	9	23	0	-	63	5430
% Lights	94.1	96.9	100.0	100.0	-	97.0	100.0	95.8	97.5	100.0	-	95.9	100.0	100.0	98.2	-	-	99.0	100.0	100.0	92.0	-	-	96.9	96.6
Mediums	1	84	0	0	-	85	0	90	1	0	-	91	0	0	2	0	-	2	0	0	2	0	-	2	180
% Mediums	5.9	3.0	0.0	0.0	-	2.9	0.0	3.9	2.5	0.0	-	3.8	0.0	0.0	1.8	-	-	1.0	0.0	0.0	8.0	-	-	3.1	3.2
Articulated Trucks	0	4	0	0	-	4	0	7	0	0	-	7	0	0	0	0	-	0	0	0	0	0	-	0	11
% Articulated Trucks	0.0	0.1	0.0	0.0	-	0.1	0.0	0.3	0.0	0.0	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	71	-	-	-	-	-	9	-	-	-	-	-	36	-	-	-	-	-	89	-	-
% 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: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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

Count Name: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018

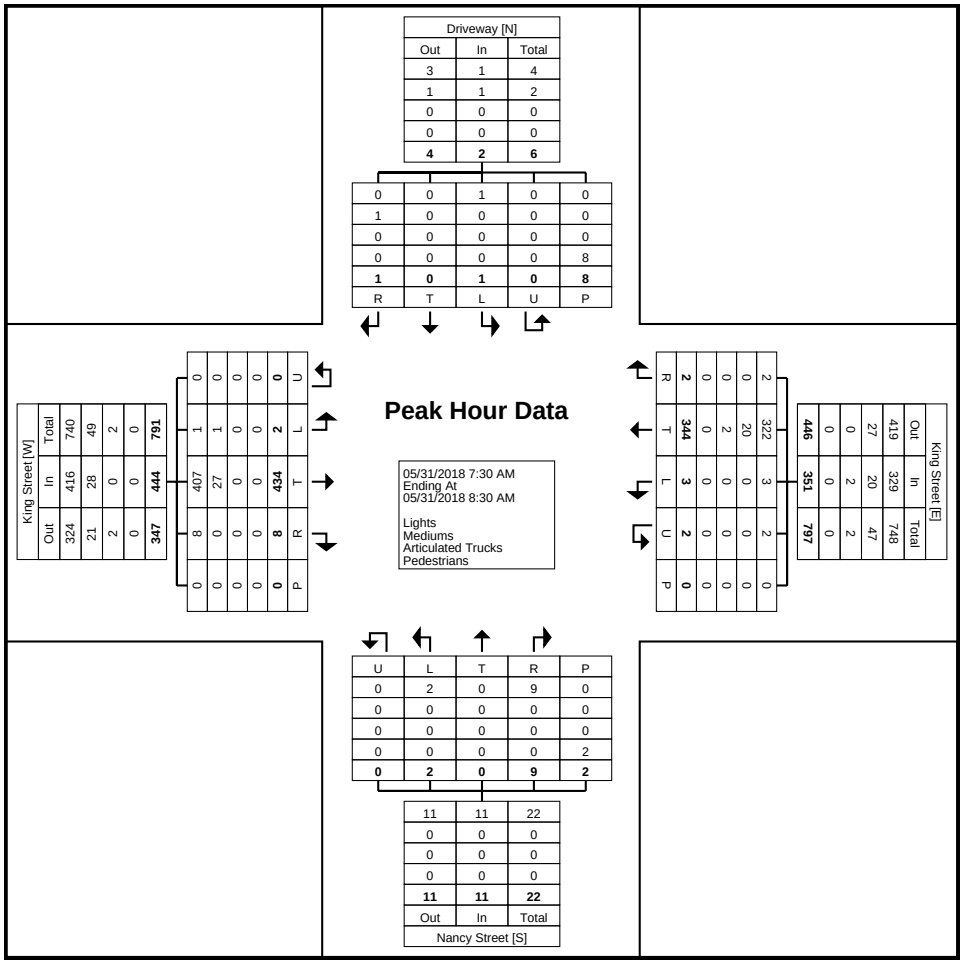
Turning Movement Peak Hour Data (7:30 AM)

Start Time	King Street Eastbound						King Street Westbound						Nancy Street Northbound						Driveway 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	
7:30 AM	1	102	1	0	0	104	0	79	1	0	0	80	1	0	1	0	0	2	0	0	0	0	3	0	186
7:45 AM	0	100	1	0	0	101	1	81	1	0	0	83	0	0	1	0	2	1	0	0	0	0	1	0	185
8:00 AM	0	120	0	0	0	120	1	83	0	2	0	86	1	0	3	0	0	4	0	0	1	0	3	1	211
8:15 AM	1	112	6	0	0	119	1	101	0	0	0	102	0	0	4	0	0	4	1	0	0	0	1	1	226
Total	2	434	8	0	0	444	3	344	2	2	0	351	2	0	9	0	2	11	1	0	1	0	8	2	808
Approach %	0.5	97.7	1.8	0.0	-	-	0.9	98.0	0.6	0.6	-	-	18.2	0.0	81.8	0.0	-	-	50.0	0.0	50.0	0.0	-	-	-
Total %	0.2	53.7	1.0	0.0	-	55.0	0.4	42.6	0.2	0.2	-	43.4	0.2	0.0	1.1	0.0	-	1.4	0.1	0.0	0.1	0.0	-	0.2	-
PHF	0.500	0.904	0.333	0.000	-	0.925	0.750	0.851	0.500	0.250	-	0.860	0.500	0.000	0.563	0.000	-	0.688	0.250	0.000	0.250	0.000	-	0.500	0.894
Lights	1	407	8	0	-	416	3	322	2	2	-	329	2	0	9	0	-	11	1	0	0	0	-	1	757
% Lights	50.0	93.8	100.0	-	-	93.7	100.0	93.6	100.0	100.0	-	93.7	100.0	-	100.0	-	-	100.0	100.0	-	0.0	-	-	50.0	93.7
Mediums	1	27	0	0	-	28	0	20	0	0	-	20	0	0	0	0	-	0	0	0	1	0	-	1	49
% Mediums	50.0	6.2	0.0	-	-	6.3	0.0	5.8	0.0	0.0	-	5.7	0.0	-	0.0	-	-	0.0	0.0	-	100.0	-	-	50.0	6.1
Articulated Trucks	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	0.0	-	0.6	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018



Turning Movement Peak Hour Data Plot (7:30 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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

Count Name: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018

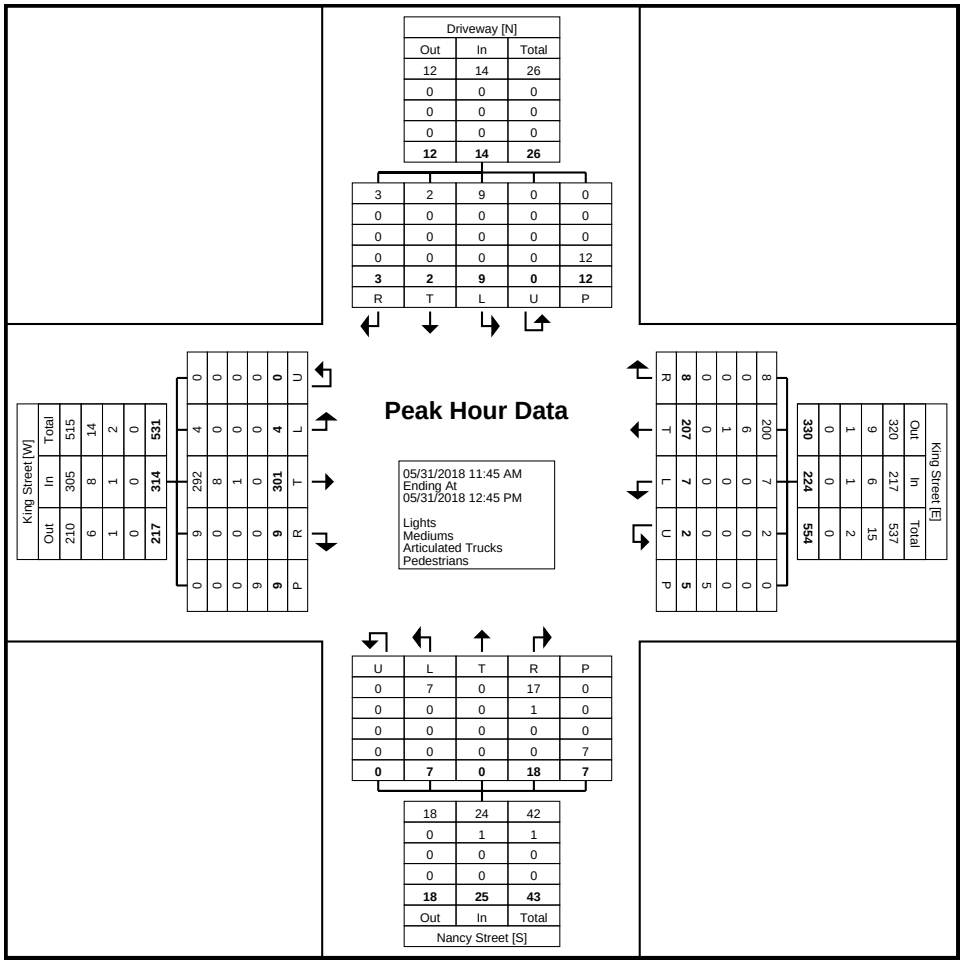
Turning Movement Peak Hour Data (11:45 AM)

Start Time	King Street Eastbound						King Street Westbound						Nancy Street Northbound						Driveway 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	
11:45 AM	1	88	2	0	3	91	2	56	0	0	0	58	3	0	4	0	2	7	0	0	0	0	6	0	156
12:00 PM	2	68	3	0	1	73	3	64	2	0	1	69	2	0	7	0	2	9	1	0	1	0	1	2	153
12:15 PM	1	70	2	0	0	73	1	35	6	1	2	43	0	0	4	0	0	4	3	2	2	0	0	7	127
12:30 PM	0	75	2	0	5	77	1	52	0	1	2	54	2	0	3	0	3	5	5	0	0	0	5	5	141
Total	4	301	9	0	9	314	7	207	8	2	5	224	7	0	18	0	7	25	9	2	3	0	12	14	577
Approach %	1.3	95.9	2.9	0.0	-	-	3.1	92.4	3.6	0.9	-	-	28.0	0.0	72.0	0.0	-	-	64.3	14.3	21.4	0.0	-	-	-
Total %	0.7	52.2	1.6	0.0	-	54.4	1.2	35.9	1.4	0.3	-	38.8	1.2	0.0	3.1	0.0	-	4.3	1.6	0.3	0.5	0.0	-	2.4	-
PHF	0.500	0.855	0.750	0.000	-	0.863	0.583	0.809	0.333	0.500	-	0.812	0.583	0.000	0.643	0.000	-	0.694	0.450	0.250	0.375	0.000	-	0.500	0.925
Lights	4	292	9	0	-	305	7	200	8	2	-	217	7	0	17	0	-	24	9	2	3	0	-	14	560
% Lights	100.0	97.0	100.0	-	-	97.1	100.0	96.6	100.0	100.0	-	96.9	100.0	-	94.4	-	-	96.0	100.0	100.0	100.0	-	-	100.0	97.1
Mediums	0	8	0	0	-	8	0	6	0	0	-	6	0	0	1	0	-	1	0	0	0	0	-	0	15
% Mediums	0.0	2.7	0.0	-	-	2.5	0.0	2.9	0.0	0.0	-	2.7	0.0	-	5.6	-	-	4.0	0.0	0.0	0.0	-	-	0.0	2.6
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.5	0.0	0.0	-	0.4	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Pedestrians	-	-	-	-	9	-	-	-	-	-	5	-	-	-	-	-	7	-	-	-	-	-	12	-	-
% 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: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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

Count Name: King Street & Nancy Street
Site Code:
Start Date: 05/31/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	King Street Eastbound						King Street Westbound						Nancy Street Northbound						Driveway 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	
4:45 PM	0	133	6	0	0	139	4	79	1	0	0	84	4	1	7	0	0	12	0	0	3	0	4	3	238
5:00 PM	0	128	6	0	1	134	1	84	0	0	0	85	3	0	8	0	0	11	1	1	1	0	3	3	233
5:15 PM	0	112	2	0	1	114	5	97	2	0	0	104	0	0	3	0	7	3	1	0	0	0	3	1	222
5:30 PM	1	124	4	0	6	129	4	85	1	0	0	90	2	0	2	0	0	4	2	0	1	0	5	3	226
Total	1	497	18	0	8	516	14	345	4	0	0	363	9	1	20	0	7	30	4	1	5	0	15	10	919
Approach %	0.2	96.3	3.5	0.0	-	-	3.9	95.0	1.1	0.0	-	-	30.0	3.3	66.7	0.0	-	-	40.0	10.0	50.0	0.0	-	-	-
Total %	0.1	54.1	2.0	0.0	-	56.1	1.5	37.5	0.4	0.0	-	39.5	1.0	0.1	2.2	0.0	-	3.3	0.4	0.1	0.5	0.0	-	1.1	-
PHF	0.250	0.934	0.750	0.000	-	0.928	0.700	0.889	0.500	0.000	-	0.873	0.563	0.250	0.625	0.000	-	0.625	0.500	0.250	0.417	0.000	-	0.833	0.965
Lights	1	491	18	0	-	510	14	340	4	0	-	358	9	1	20	0	-	30	4	1	4	0	-	9	907
% Lights	100.0	98.8	100.0	-	-	98.8	100.0	98.6	100.0	-	-	98.6	100.0	100.0	100.0	-	-	100.0	100.0	100.0	80.0	-	-	90.0	98.7
Mediums	0	5	0	0	-	5	0	4	0	0	-	4	0	0	0	0	-	0	0	0	1	0	-	1	10
% Mediums	0.0	1.0	0.0	-	-	1.0	0.0	1.2	0.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	20.0	-	-	10.0	1.1
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	8	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	15	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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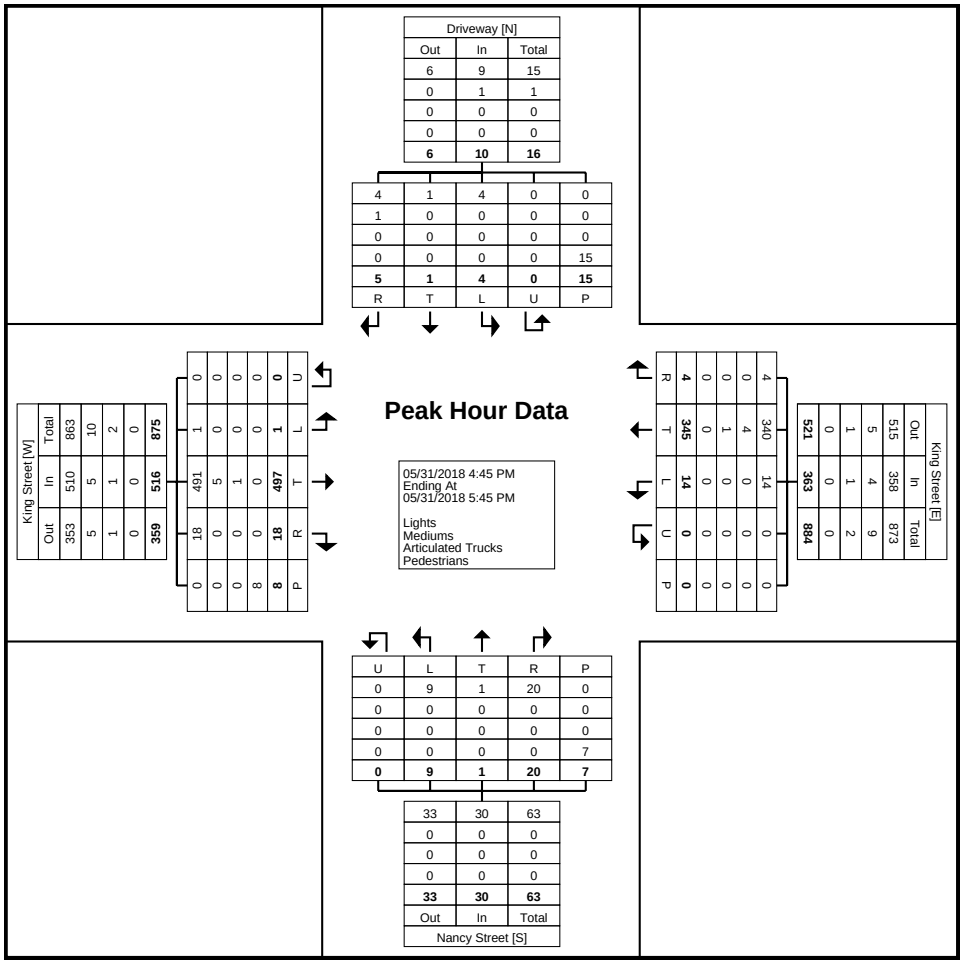

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Count Name: Nancy Street & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Data

Start Time	Elizabeth Street Eastbound						Elizabeth Street Westbound						Nancy Street Northbound						Nancy 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	0	3	0	0	0	3	0	1	1	0	0	2	0	0	0	0	0	0	4	0	0	0	0	4	9
7:15 AM	0	3	0	0	0	3	0	1	0	0	0	1	0	0	1	0	0	1	1	0	1	0	0	2	7
7:30 AM	0	2	0	0	0	2	0	4	1	0	0	5	0	0	0	0	0	0	1	0	0	0	0	1	8
7:45 AM	0	0	0	0	0	0	1	2	0	0	0	3	0	2	0	0	0	2	2	0	0	0	0	2	7
Hourly Total	0	8	0	0	0	8	1	8	2	0	0	11	0	2	1	0	0	3	8	0	1	0	0	9	31
8:00 AM	0	3	0	0	0	3	0	1	2	0	0	3	0	0	1	0	0	1	1	0	0	0	1	1	8
8:15 AM	1	2	0	0	0	3	0	2	2	0	0	4	0	0	0	0	0	0	6	1	0	0	0	7	14
8:30 AM	0	2	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	12	0	0	0	0	12	15
8:45 AM	1	5	0	0	0	6	1	5	5	0	0	11	0	0	0	0	0	0	3	1	1	0	0	5	22
Hourly Total	2	12	0	0	0	14	1	8	10	0	0	19	0	0	1	0	0	1	22	2	1	0	1	25	59
9:00 AM	0	2	0	0	0	2	0	3	5	0	0	8	1	0	0	0	0	1	2	0	0	0	0	2	13
9:15 AM	1	0	0	0	0	1	0	1	3	0	0	4	0	0	0	0	0	0	1	1	2	0	0	4	9
9:30 AM	0	2	0	0	0	2	0	1	7	0	0	8	0	0	1	0	0	1	2	0	0	0	0	2	13
9:45 AM	0	5	0	0	0	5	0	0	2	0	0	2	0	1	0	0	0	1	3	0	1	0	0	4	12
Hourly Total	1	9	0	0	0	10	0	5	17	0	0	22	1	1	1	0	0	3	8	1	3	0	0	12	47
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	2	0	0	0	2	0	6	4	1	0	11	0	0	1	0	0	1	1	0	0	0	0	1	15
11:15 AM	1	4	0	0	0	5	0	2	3	0	0	5	0	0	0	0	0	0	5	0	1	0	0	6	16
11:30 AM	1	1	0	0	0	2	0	2	7	0	0	9	0	0	0	0	0	0	2	0	0	0	0	2	13
11:45 AM	0	8	0	0	0	8	0	7	6	0	0	13	0	0	1	0	0	1	3	0	1	0	0	4	26
Hourly Total	2	15	0	0	0	17	0	17	20	1	0	38	0	0	2	0	0	2	11	0	2	0	0	13	70
12:00 PM	2	0	1	0	0	3	1	2	4	0	0	7	0	2	1	0	0	3	5	0	2	0	0	7	20
12:15 PM	0	6	0	0	0	6	1	4	5	0	0	10	0	0	0	0	0	0	5	0	0	0	0	5	21
12:30 PM	1	3	0	0	0	4	0	6	6	0	1	12	1	0	0	0	0	1	3	1	1	0	2	5	22
12:45 PM	0	2	0	0	0	2	1	3	6	0	0	10	0	1	2	0	0	3	6	0	0	0	0	6	21
Hourly Total	3	11	1	0	0	15	3	15	21	0	1	39	1	3	3	0	0	7	19	1	3	0	2	23	84
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	4	0	0	0	4	1	15	16	0	3	32	0	2	5	0	0	7	3	0	0	0	0	3	46
3:15 PM	1	1	0	0	0	2	0	10	5	0	0	15	0	0	0	0	0	0	2	0	0	0	0	2	19
3:30 PM	0	4	0	0	0	4	1	7	5	2	0	15	0	1	0	0	0	1	9	1	0	0	1	10	30
3:45 PM	1	5	1	0	0	7	1	10	13	0	0	24	0	0	0	0	0	0	6	0	2	0	0	8	39
Hourly Total	2	14	1	0	0	17	3	42	39	2	3	86	0	3	5	0	0	8	20	1	2	0	1	23	134
4:00 PM	0	4	0	0	0	4	0	3	3	0	0	6	0	2	0	0	0	2	5	0	0	0	0	5	17
4:15 PM	0	2	0	0	2	2	0	6	8	0	0	14	0	0	0	0	2	0	6	0	2	0	0	8	24
4:30 PM	0	2	0	0	0	2	1	6	8	0	0	15	0	0	0	0	0	0	7	0	0	0	0	7	24
4:45 PM	0	8	0	0	2	8	1	12	11	0	0	24	0	0	2	0	2	2	8	1	0	0	0	9	43
Hourly Total	0	16	0	0	4	16	2	27	30	0	0	59	0	2	2	0	4	4	26	1	2	0	0	29	108

5:00 PM	1	5	0	0	0	6	0	3	10	0	0	13	0	0	1	0	1	1	10	0	0	0	0	10	30
5:15 PM	0	4	0	0	2	4	2	9	0	0	0	11	0	1	0	0	0	1	6	0	0	0	0	6	22
5:30 PM	0	3	0	0	0	3	0	5	5	0	0	10	0	0	0	0	0	0	3	1	1	0	0	5	18
5:45 PM	0	1	0	0	3	1	2	3	10	0	0	15	0	0	0	0	1	0	6	0	2	0	0	8	24
Hourly Total	1	13	0	0	5	14	4	20	25	0	0	49	0	1	1	0	2	2	25	1	3	0	0	29	94
Grand Total	11	98	2	0	9	111	14	142	164	3	4	323	2	12	16	0	6	30	139	7	17	0	4	163	627
Approach %	9.9	88.3	1.8	0.0	-	-	4.3	44.0	50.8	0.9	-	-	6.7	40.0	53.3	0.0	-	-	85.3	4.3	10.4	0.0	-	-	-
Total %	1.8	15.6	0.3	0.0	-	17.7	2.2	22.6	26.2	0.5	-	51.5	0.3	1.9	2.6	0.0	-	4.8	22.2	1.1	2.7	0.0	-	26.0	-
Lights	10	96	2	0	-	108	14	141	163	3	-	321	2	12	16	0	-	30	139	7	17	0	-	163	622
% Lights	90.9	98.0	100.0	-	-	97.3	100.0	99.3	99.4	100.0	-	99.4	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	99.2
Mediums	1	2	0	0	-	3	0	1	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	5
% Mediums	9.1	2.0	0.0	-	-	2.7	0.0	0.7	0.6	0.0	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.8
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	-	-	-	-	9	-	-	-	-	-	4	-	-	-	-	-	6	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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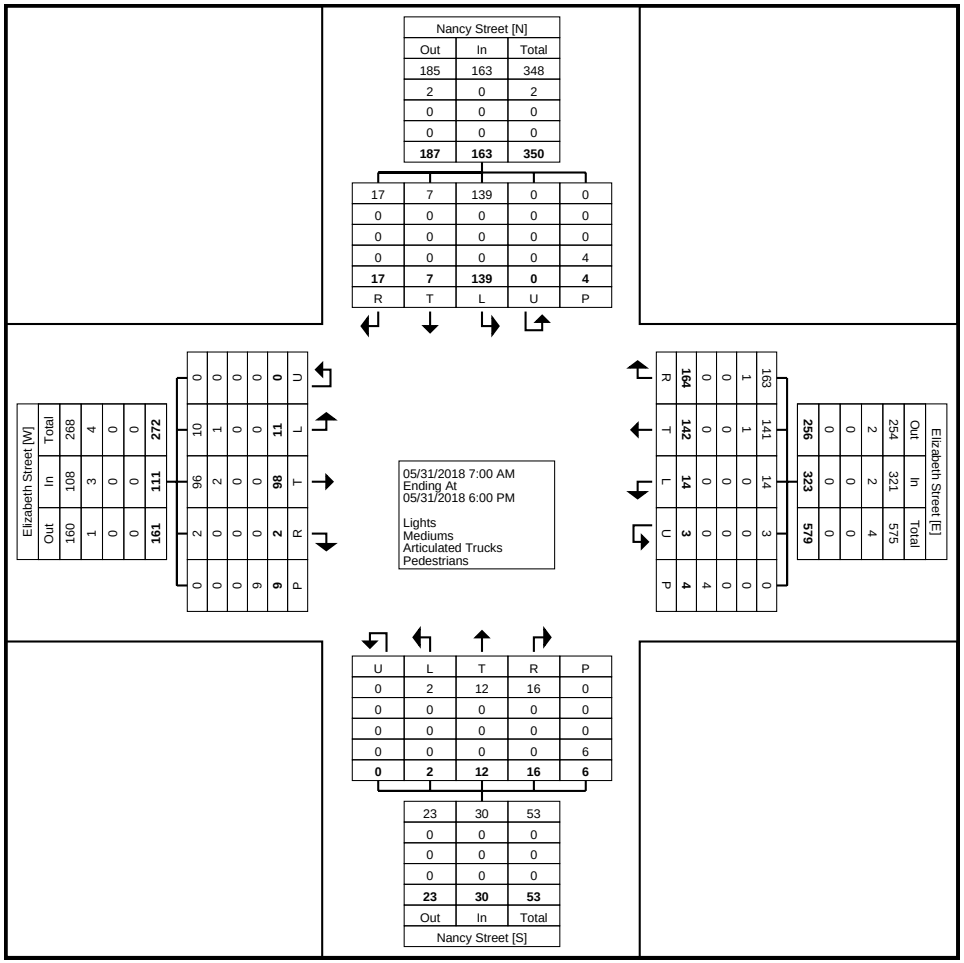
Count Name: Nancy Street & Elizabeth Street
Site Code:
Start Date: 05/31/2018



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Turning Movement Peak Hour Data (8:15 AM)

Start Time	Elizabeth Street Eastbound						Elizabeth Street Westbound						Nancy Street Northbound						Nancy 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	
8:15 AM	1	2	0	0	0	3	0	2	2	0	0	4	0	0	0	0	0	0	6	1	0	0	0	7	14
8:30 AM	0	2	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	12	0	0	0	0	12	15
8:45 AM	1	5	0	0	0	6	1	5	5	0	0	11	0	0	0	0	0	0	3	1	1	0	0	5	22
9:00 AM	0	2	0	0	0	2	0	3	5	0	0	8	1	0	0	0	0	1	2	0	0	0	0	2	13
Total	2	11	0	0	0	13	1	10	13	0	0	24	1	0	0	0	0	1	23	2	1	0	0	26	64
Approach %	15.4	84.6	0.0	0.0	-	-	4.2	41.7	54.2	0.0	-	-	100.0	0.0	0.0	0.0	-	-	88.5	7.7	3.8	0.0	-	-	-
Total %	3.1	17.2	0.0	0.0	-	20.3	1.6	15.6	20.3	0.0	-	37.5	1.6	0.0	0.0	0.0	-	1.6	35.9	3.1	1.6	0.0	-	40.6	-
PHF	0.500	0.550	0.000	0.000	-	0.542	0.250	0.500	0.650	0.000	-	0.545	0.250	0.000	0.000	0.000	-	0.250	0.479	0.500	0.250	0.000	-	0.542	0.727
Lights	2	11	0	0	-	13	1	10	13	0	-	24	1	0	0	0	-	1	23	2	1	0	-	26	64
% Lights	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	-	-	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0
Mediums	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Mediums	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
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
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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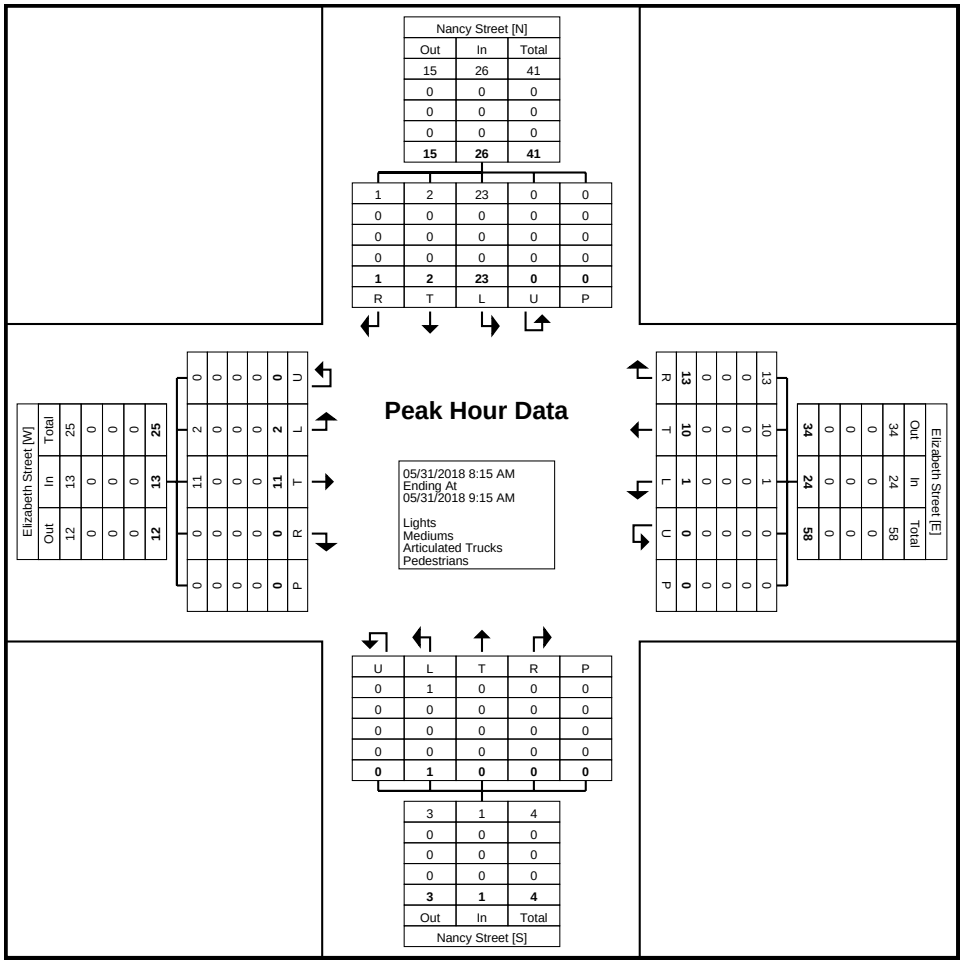

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Start Time	Elizabeth Street Eastbound						Elizabeth Street Westbound						Nancy Street Northbound						Nancy Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	0	8	0	0	0	8	0	7	6	0	0	13	0	0	1	0	0	1	3	0	1	0	0	4	26
12:00 PM	2	0	1	0	0	3	1	2	4	0	0	7	0	2	1	0	0	3	5	0	2	0	0	7	20
12:15 PM	0	6	0	0	0	6	1	4	5	0	0	10	0	0	0	0	0	0	5	0	0	0	0	5	21
12:30 PM	1	3	0	0	0	4	0	6	6	0	1	12	1	0	0	0	0	1	3	1	1	0	2	5	22
Total	3	17	1	0	0	21	2	19	21	0	1	42	1	2	2	0	0	5	16	1	4	0	2	21	89
Approach %	14.3	81.0	4.8	0.0	-	-	4.8	45.2	50.0	0.0	-	-	20.0	40.0	40.0	0.0	-	-	76.2	4.8	19.0	0.0	-	-	-
Total %	3.4	19.1	1.1	0.0	-	23.6	2.2	21.3	23.6	0.0	-	47.2	1.1	2.2	2.2	0.0	-	5.6	18.0	1.1	4.5	0.0	-	23.6	-
PHF	0.375	0.531	0.250	0.000	-	0.656	0.500	0.679	0.875	0.000	-	0.808	0.250	0.250	0.500	0.000	-	0.417	0.800	0.250	0.500	0.000	-	0.750	0.856
Lights	2	17	1	0	-	20	2	19	21	0	-	42	1	2	2	0	-	5	16	1	4	0	-	21	88
% Lights	66.7	100.0	100.0	-	-	95.2	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	98.9
Mediums	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Mediums	33.3	0.0	0.0	-	-	4.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	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
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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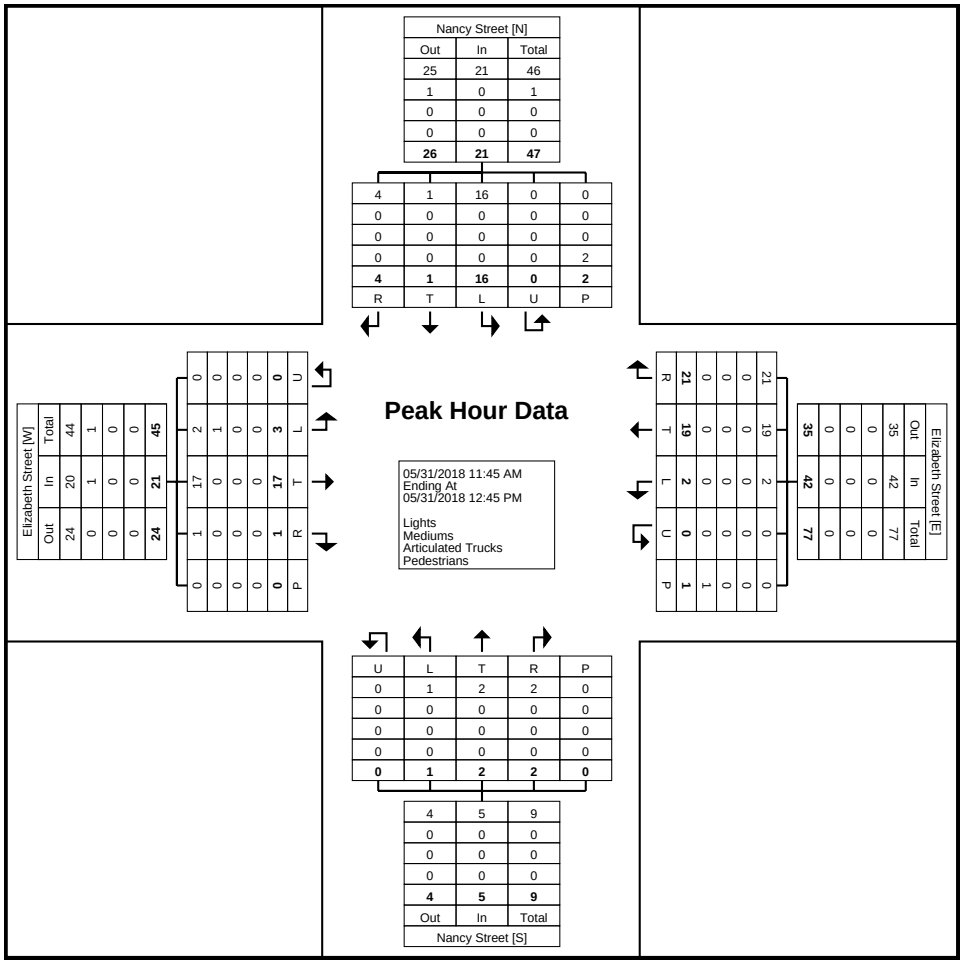

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22 King Street South, Suite 300

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

Count Name: Nancy Street & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Peak Hour Data (3:00 PM)

Start Time	Elizabeth Street Eastbound						Elizabeth Street Westbound						Nancy Street Northbound						Nancy 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	
3:00 PM	0	4	0	0	0	4	1	15	16	0	3	32	0	2	5	0	0	7	3	0	0	0	0	3	46
3:15 PM	1	1	0	0	0	2	0	10	5	0	0	15	0	0	0	0	0	0	2	0	0	0	0	2	19
3:30 PM	0	4	0	0	0	4	1	7	5	2	0	15	0	1	0	0	0	1	9	1	0	0	1	10	30
3:45 PM	1	5	1	0	0	7	1	10	13	0	0	24	0	0	0	0	0	0	6	0	2	0	0	8	39
Total	2	14	1	0	0	17	3	42	39	2	3	86	0	3	5	0	0	8	20	1	2	0	1	23	134
Approach %	11.8	82.4	5.9	0.0	-	-	3.5	48.8	45.3	2.3	-	-	0.0	37.5	62.5	0.0	-	-	87.0	4.3	8.7	0.0	-	-	-
Total %	1.5	10.4	0.7	0.0	-	12.7	2.2	31.3	29.1	1.5	-	64.2	0.0	2.2	3.7	0.0	-	6.0	14.9	0.7	1.5	0.0	-	17.2	-
PHF	0.500	0.700	0.250	0.000	-	0.607	0.750	0.700	0.609	0.250	-	0.672	0.000	0.375	0.250	0.000	-	0.286	0.556	0.250	0.250	0.000	-	0.575	0.728
Lights	2	12	1	0	-	15	3	41	39	2	-	85	0	3	5	0	-	8	20	1	2	0	-	23	131
% Lights	100.0	85.7	100.0	-	-	88.2	100.0	97.6	100.0	100.0	-	98.8	-	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	97.8
Mediums	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	3
% Mediums	0.0	14.3	0.0	-	-	11.8	0.0	2.4	0.0	0.0	-	1.2	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	2.2
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
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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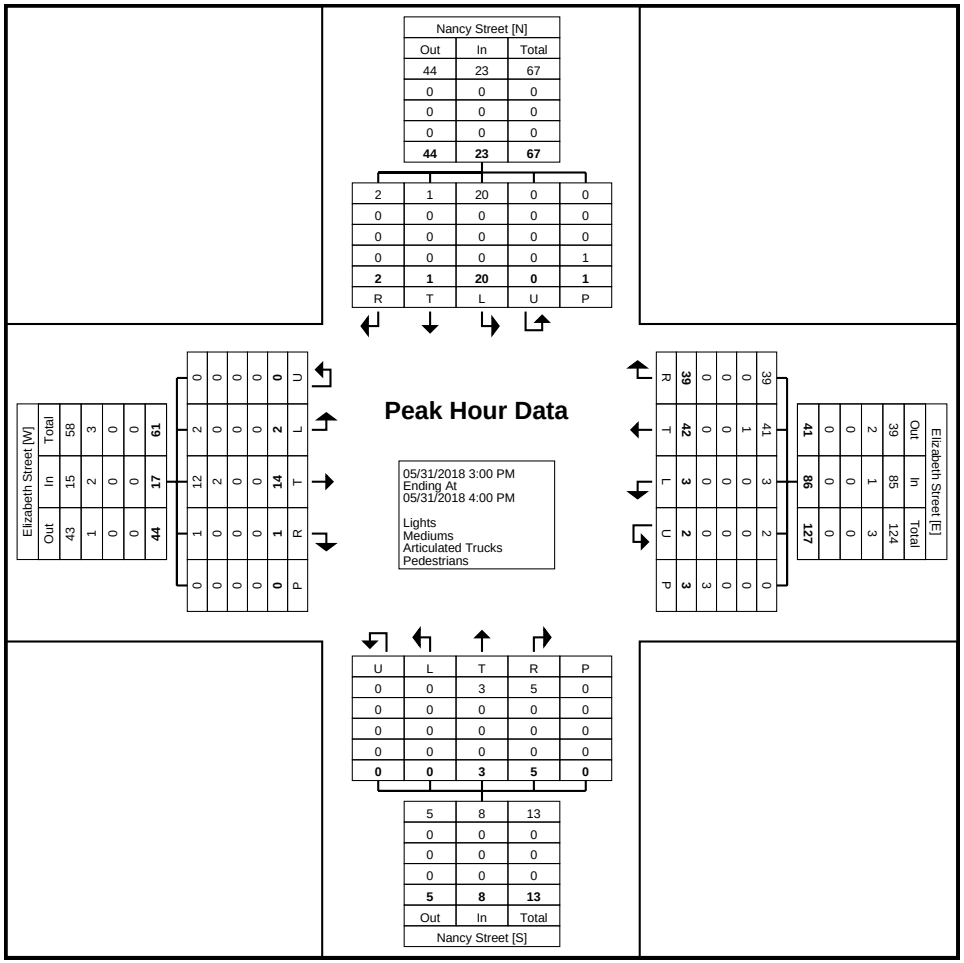

Turning Movement Peak Hour Data Plot (3:00 PM)

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Count Name: Queen Street South & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Data

Start Time	Elizabeth Street Eastbound					Queen Street Northbound					Queen Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	7	0	0	7	2	67	0	0	69	220	0	0	0	220	296
7:15 AM	0	5	0	0	5	1	66	0	0	67	207	0	0	0	207	279
7:30 AM	0	3	0	0	3	4	93	0	0	97	224	1	0	0	225	325
7:45 AM	0	2	0	3	2	3	112	0	0	115	294	1	0	0	295	412
Hourly Total	0	17	0	3	17	10	338	0	0	348	945	2	0	0	947	1312
8:00 AM	0	5	0	0	5	2	103	0	0	105	248	0	0	1	248	358
8:15 AM	0	8	0	0	8	3	133	0	0	136	261	0	0	0	261	405
8:30 AM	1	12	0	0	13	1	119	0	0	120	296	0	0	0	296	429
8:45 AM	0	9	0	0	9	11	127	0	0	138	214	1	0	0	215	362
Hourly Total	1	34	0	0	35	17	482	0	0	499	1019	1	0	1	1020	1554
9:00 AM	0	3	0	2	3	8	139	0	0	147	190	0	0	0	190	340
9:15 AM	0	1	0	3	1	3	126	0	0	129	185	0	0	0	185	315
9:30 AM	0	5	0	1	5	8	123	0	0	131	231	0	0	0	231	367
9:45 AM	1	7	0	1	8	2	150	0	0	152	215	0	0	1	215	375
Hourly Total	1	16	0	7	17	21	538	0	0	559	821	0	0	1	821	1397
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	4	0	0	5	10	163	0	0	173	165	1	0	0	166	344
11:15 AM	0	9	0	0	9	5	188	0	0	193	179	0	0	0	179	381
11:30 AM	0	4	0	0	4	11	191	0	0	202	181	0	0	0	181	387
11:45 AM	0	13	0	0	13	10	176	0	0	186	177	1	0	0	178	377
Hourly Total	1	30	0	0	31	36	718	0	0	754	702	2	0	0	704	1489
12:00 PM	0	5	0	1	5	6	184	0	0	190	214	2	0	1	216	411
12:15 PM	1	10	0	1	11	12	189	0	0	201	178	0	0	0	178	390
12:30 PM	0	7	0	0	7	11	208	0	0	219	197	1	0	0	198	424
12:45 PM	1	11	0	0	12	9	191	0	0	200	214	3	0	0	217	429
Hourly Total	2	33	0	2	35	38	772	0	0	810	803	6	0	1	809	1654
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	13	0	1	13	27	313	0	0	340	174	1	0	0	175	528
3:15 PM	0	2	0	0	2	16	277	0	0	293	168	0	0	0	168	463
3:30 PM	0	15	0	1	15	15	242	0	0	257	188	0	0	0	188	460
3:45 PM	0	11	0	1	11	21	258	1	0	280	185	1	0	0	186	477
Hourly Total	0	41	0	3	41	79	1090	1	0	1170	715	2	0	0	717	1928
4:00 PM	0	10	0	1	10	6	310	0	0	316	157	0	0	0	157	483
4:15 PM	0	8	0	2	8	13	296	0	0	309	157	2	0	0	159	476
4:30 PM	0	9	0	1	9	13	336	0	0	349	162	1	0	0	163	521
4:45 PM	0	19	0	1	19	28	357	0	0	385	158	0	0	0	158	562
Hourly Total	0	46	0	5	46	60	1299	0	0	1359	634	3	0	0	637	2042
5:00 PM	1	13	0	7	14	8	378	0	0	386	187	2	0	0	189	589

5:15 PM	0	11	0	1	11	10	373	0	0	383	155	1	0	0	156	550
5:30 PM	0	7	0	2	7	10	351	0	0	361	158	1	0	0	159	527
5:45 PM	0	8	0	0	8	13	342	0	0	355	192	1	0	0	193	556
Hourly Total	1	39	0	10	40	41	1444	0	0	1485	692	5	0	0	697	2222
Grand Total	6	256	0	30	262	302	6681	1	0	6984	6331	21	0	3	6352	13598
Approach %	2.3	97.7	0.0	-	-	4.3	95.7	0.0	-	-	99.7	0.3	0.0	-	-	-
Total %	0.0	1.9	0.0	-	1.9	2.2	49.1	0.0	-	51.4	46.6	0.2	0.0	-	46.7	-
Lights	6	254	0	-	260	300	6537	1	-	6838	6210	21	0	-	6231	13329
% Lights	100.0	99.2	-	-	99.2	99.3	97.8	100.0	-	97.9	98.1	100.0	-	-	98.1	98.0
Mediums	0	2	0	-	2	2	132	0	-	134	109	0	0	-	109	245
% Mediums	0.0	0.8	-	-	0.8	0.7	2.0	0.0	-	1.9	1.7	0.0	-	-	1.7	1.8
Articulated Trucks	0	0	0	-	0	0	12	0	-	12	12	0	0	-	12	24
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	0.2	0.2	0.0	-	-	0.2	0.2
Pedestrians	-	-	-	30	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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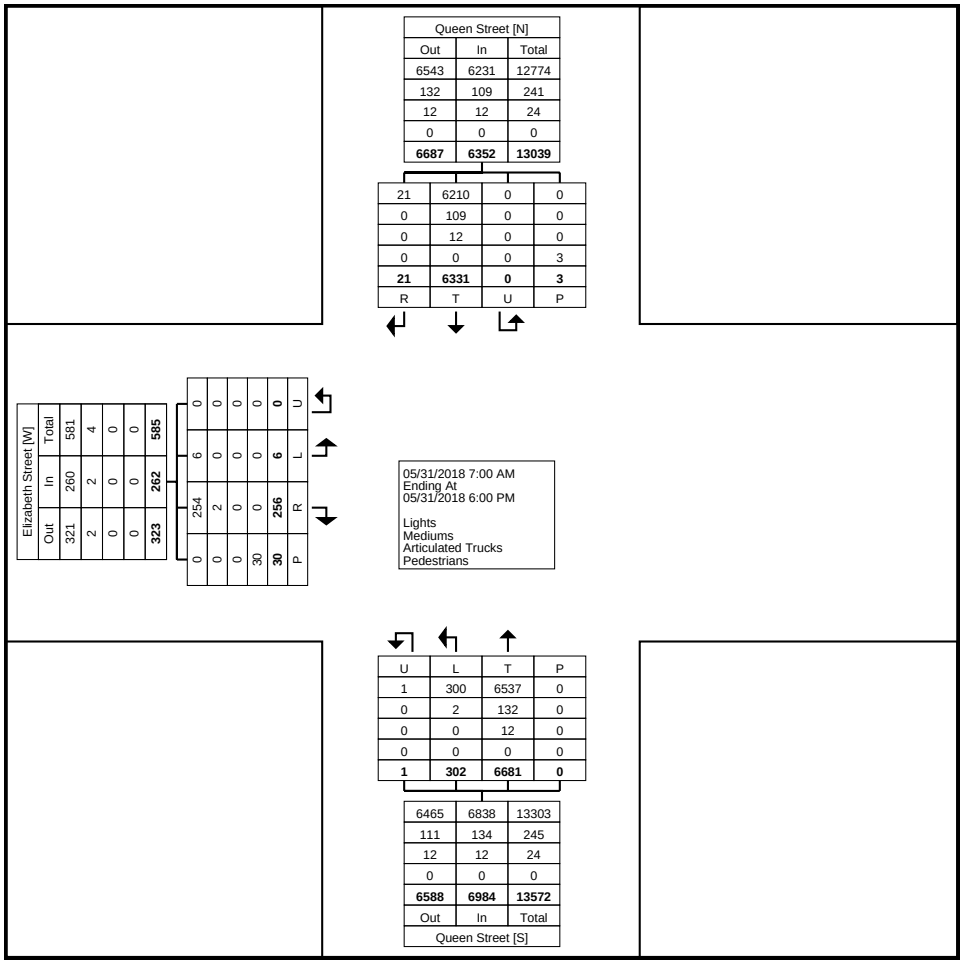

Turning Movement Data Plot

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Count Name: Queen Street South & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Elizabeth Street Eastbound					Queen Street Northbound					Queen Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	0	2	0	3	2	3	112	0	0	115	294	1	0	0	295	412
8:00 AM	0	5	0	0	5	2	103	0	0	105	248	0	0	1	248	358
8:15 AM	0	8	0	0	8	3	133	0	0	136	261	0	0	0	261	405
8:30 AM	1	12	0	0	13	1	119	0	0	120	296	0	0	0	296	429
Total	1	27	0	3	28	9	467	0	0	476	1099	1	0	1	1100	1604
Approach %	3.6	96.4	0.0	-	-	1.9	98.1	0.0	-	-	99.9	0.1	0.0	-	-	-
Total %	0.1	1.7	0.0	-	1.7	0.6	29.1	0.0	-	29.7	68.5	0.1	0.0	-	68.6	-
PHF	0.250	0.563	0.000	-	0.538	0.750	0.878	0.000	-	0.875	0.928	0.250	0.000	-	0.929	0.935
Lights	1	27	0	-	28	9	434	0	-	443	1068	1	0	-	1069	1540
% Lights	100.0	100.0	-	-	100.0	100.0	92.9	-	-	93.1	97.2	100.0	-	-	97.2	96.0
Mediums	0	0	0	-	0	0	32	0	-	32	29	0	0	-	29	61
% Mediums	0.0	0.0	-	-	0.0	0.0	6.9	-	-	6.7	2.6	0.0	-	-	2.6	3.8
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	2	0	0	-	2	3
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.2	-	-	0.2	0.2	0.0	-	-	0.2	0.2
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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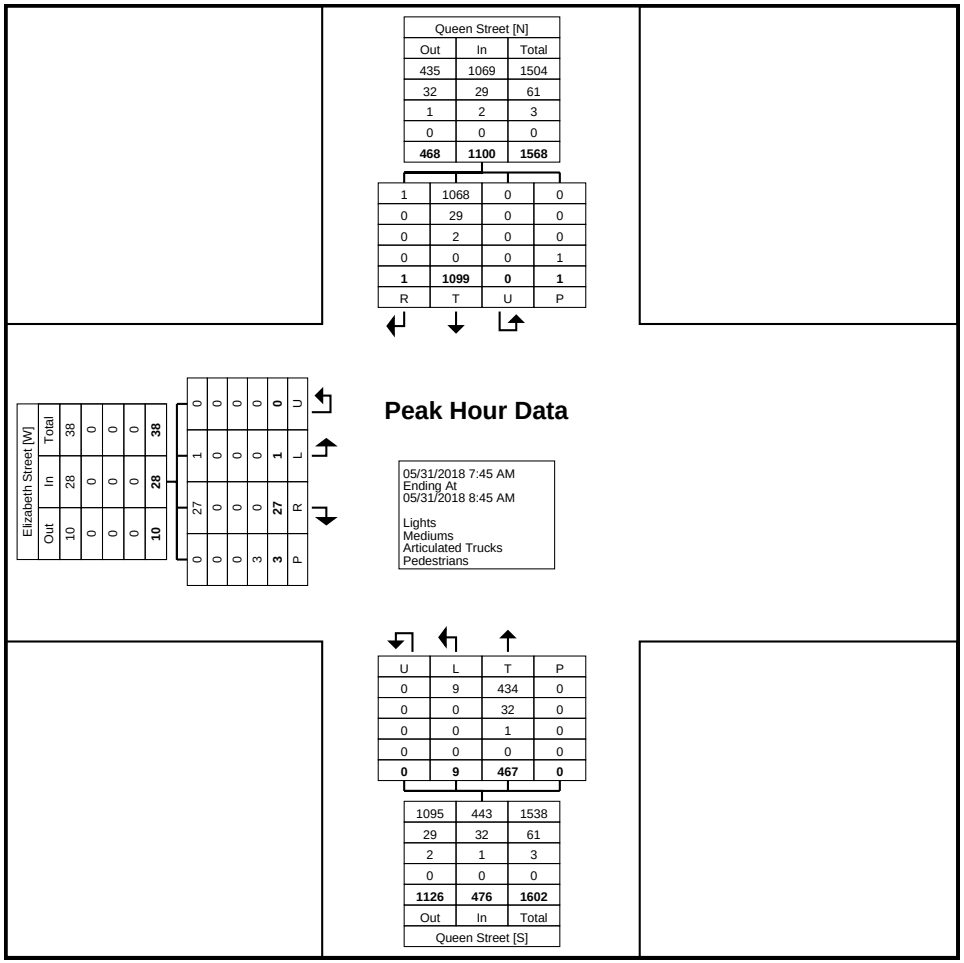

Turning Movement Peak Hour Data Plot (7:45 AM)

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Count Name: Queen Street South & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Elizabeth Street Eastbound					Queen Street Northbound					Queen Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	0	5	0	1	5	6	184	0	0	190	214	2	0	1	216	411
12:15 PM	1	10	0	1	11	12	189	0	0	201	178	0	0	0	178	390
12:30 PM	0	7	0	0	7	11	208	0	0	219	197	1	0	0	198	424
12:45 PM	1	11	0	0	12	9	191	0	0	200	214	3	0	0	217	429
Total	2	33	0	2	35	38	772	0	0	810	803	6	0	1	809	1654
Approach %	5.7	94.3	0.0	-	-	4.7	95.3	0.0	-	-	99.3	0.7	0.0	-	-	-
Total %	0.1	2.0	0.0	-	2.1	2.3	46.7	0.0	-	49.0	48.5	0.4	0.0	-	48.9	-
PHF	0.500	0.750	0.000	-	0.729	0.792	0.928	0.000	-	0.925	0.938	0.500	0.000	-	0.932	0.964
Lights	2	33	0	-	35	38	759	0	-	797	794	6	0	-	800	1632
% Lights	100.0	100.0	-	-	100.0	100.0	98.3	-	-	98.4	98.9	100.0	-	-	98.9	98.7
Mediums	0	0	0	-	0	0	11	0	-	11	9	0	0	-	9	20
% Mediums	0.0	0.0	-	-	0.0	0.0	1.4	-	-	1.4	1.1	0.0	-	-	1.1	1.2
Articulated Trucks	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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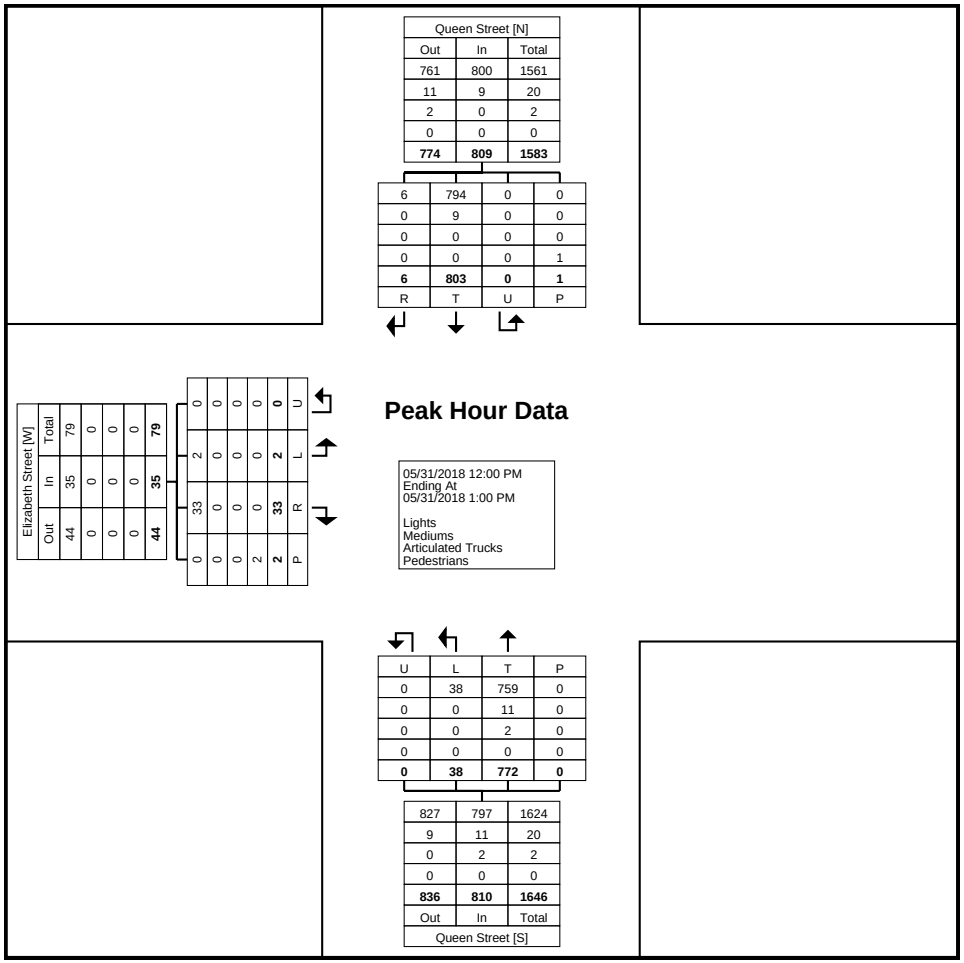

Turning Movement Peak Hour Data Plot (12:00 PM)

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Count Name: Queen Street South & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Elizabeth Street Eastbound					Queen Street Northbound					Queen Street Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:45 PM	0	19	0	1	19	28	357	0	0	385	158	0	0	0	158	562
5:00 PM	1	13	0	7	14	8	378	0	0	386	187	2	0	0	189	589
5:15 PM	0	11	0	1	11	10	373	0	0	383	155	1	0	0	156	550
5:30 PM	0	7	0	2	7	10	351	0	0	361	158	1	0	0	159	527
Total	1	50	0	11	51	56	1459	0	0	1515	658	4	0	0	662	2228
Approach %	2.0	98.0	0.0	-	-	3.7	96.3	0.0	-	-	99.4	0.6	0.0	-	-	-
Total %	0.0	2.2	0.0	-	2.3	2.5	65.5	0.0	-	68.0	29.5	0.2	0.0	-	29.7	-
PHF	0.250	0.658	0.000	-	0.671	0.500	0.965	0.000	-	0.981	0.880	0.500	0.000	-	0.876	0.946
Lights	1	50	0	-	51	56	1454	0	-	1510	648	4	0	-	652	2213
% Lights	100.0	100.0	-	-	100.0	100.0	99.7	-	-	99.7	98.5	100.0	-	-	98.5	99.3
Mediums	0	0	0	-	0	0	5	0	-	5	9	0	0	-	9	14
% Mediums	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.3	1.4	0.0	-	-	1.4	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	0.0
Pedestrians	-	-	-	11	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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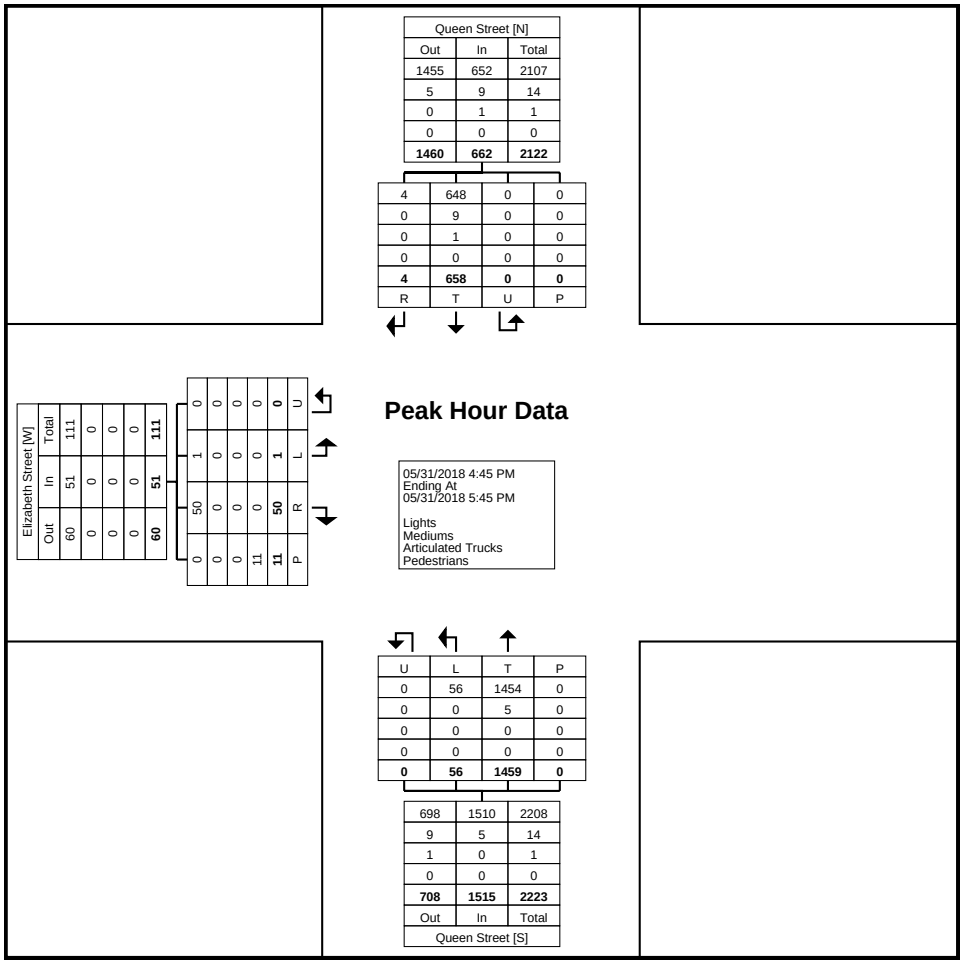

Turning Movement Peak Hour Data Plot (4:45 PM)

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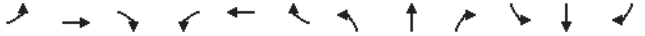
Count Name: Queen Street South & Elizabeth Street
Site Code:
Start Date: 05/31/2018

Appendix C

Existing Traffic Operational Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	436	9	3	345	0	1	0	9	0	0	0
Future Volume (Veh/h)	0	436	9	3	345	0	1	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	0	436	9	3	345	0	1	0	9	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)		31										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	345			445			792	792	440	800	796	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	345			385			751	751	380	761	756	345
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	100
cM capacity (veh/h)	1214			1110			309	320	631	300	318	698

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	445	348	10	0
Volume Left	0	3	1	0
Volume Right	9	0	9	0
cSH	1214	1110	571	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.1	0.4	0.0
Control Delay (s)	0.0	0.1	11.4	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.1	11.4	0.0
Approach LOS			B	A

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	33.5%	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)	0	2	0	0	3	5	1	0	0	2	0	0
Future Volume (vph)	0	2	0	0	3	5	1	0	0	2	0	0
Peak Hour 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
Hourly flow rate (vph)	0	2	0	0	3	5	1	0	0	2	0	0

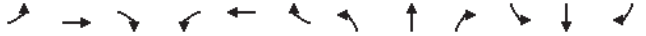
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	2	8	1	2
Volume Left (vph)	0	0	1	2
Volume Right (vph)	0	5	0	0
Hadj (s)	0.03	-0.34	0.23	0.23
Departure Headway (s)	3.9	3.6	4.2	4.2
Degree Utilization, x	0.00	0.01	0.00	0.00
Capacity (veh/h)	904	1002	851	859
Control Delay (s)	7.0	6.6	7.2	7.2
Approach Delay (s)	7.0	6.6	7.2	7.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	27	9	467	1099	1
Future Volume (Veh/h)	1	27	9	467	1099	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	27	9	467	1099	1
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	1351	550	1100			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1351	550	1100			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	94	99			
cM capacity (veh/h)	139	479	630			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	28	165	311	733	367
Volume Left	1	9	0	0	0
Volume Right	27	0	0	0	1
cSH	441	630	1700	1700	1700
Volume to Capacity	0.06	0.01	0.18	0.43	0.22
Queue Length 95th (m)	1.6	0.3	0.0	0.0	0.0
Control Delay (s)	13.7	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.7	0.3		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	40.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	497	18	14	345	4	9	1	20	4	1	5
Future Volume (Veh/h)	1	497	18	14	345	4	9	1	20	4	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	1	497	18	14	345	4	9	1	20	4	1	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		31										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	349			515			888	885	506	904	892	347
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			445			845	841	435	861	849	347
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
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	97	98	100	99
cM capacity (veh/h)	1210			1041			258	277	580	245	274	696

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	516	363	30	10
Volume Left	1	14	9	4
Volume Right	18	4	20	5
cSH	1210	1041	411	368
Volume to Capacity	0.00	0.01	0.07	0.03
Queue Length 95th (m)	0.0	0.3	1.9	0.7
Control Delay (s)	0.0	0.5	14.4	15.0
Lane LOS	A	A	B	C
Approach Delay (s)	0.0	0.5	14.4	15.0
Approach LOS			B	C

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	39.2%	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)	2	14	1	3	42	39	0	3	5	20	1	2
Future Volume (vph)	2	14	1	3	42	39	0	3	5	20	1	2
Peak Hour 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
Hourly flow rate (vph)	2	14	1	3	42	39	0	3	5	20	1	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	17	84	8	23
Volume Left (vph)	2	3	0	20
Volume Right (vph)	1	39	5	2
Hadj (s)	0.02	-0.24	-0.34	0.16
Departure Headway (s)	4.1	3.7	3.8	4.3
Degree Utilization, x	0.02	0.09	0.01	0.03
Capacity (veh/h)	869	948	914	820
Control Delay (s)	7.1	7.1	6.8	7.4
Approach Delay (s)	7.1	7.1	6.8	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.1	
Level of Service			A	
Intersection Capacity Utilization			19.8%	ICU Level of Service
Analysis Period (min)			15	A

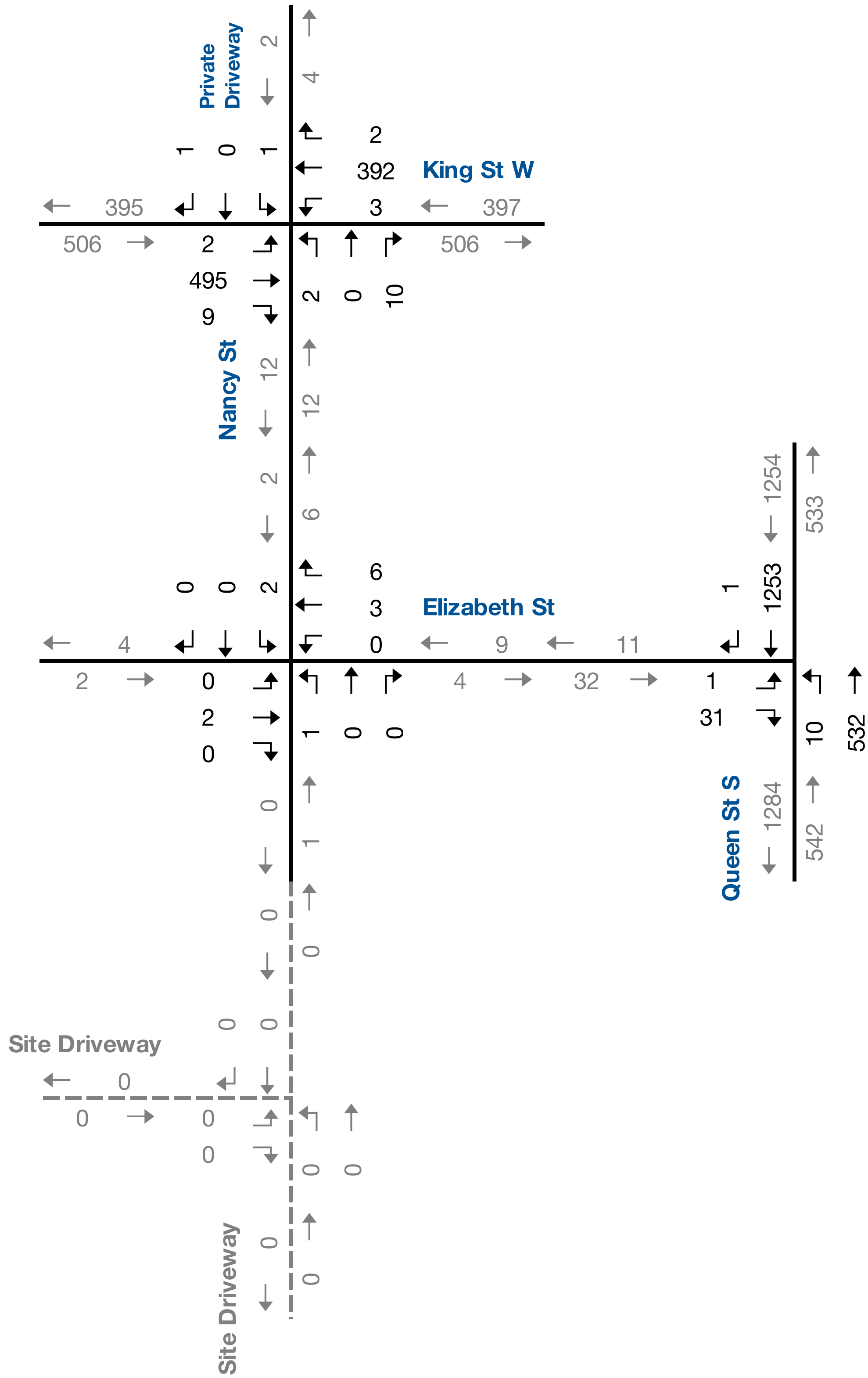
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	50	56	1469	658	4
Future Volume (Veh/h)	1	50	56	1469	658	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	50	56	1469	658	4
Pedestrians						
Lane 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	1506	331	662			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1506	331	662			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	92	94			
cM capacity (veh/h)	105	665	922			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	546	979	439	223
Volume Left	1	56	0	0	0
Volume Right	50	0	0	0	4
cSH	602	922	1700	1700	1700
Volume to Capacity	0.08	0.06	0.58	0.26	0.13
Queue Length 95th (m)	2.2	1.5	0.0	0.0	0.0
Control Delay (s)	11.5	1.6	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.5	0.6		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		73.9%	ICU Level of Service	D
Analysis Period (min)		15		

Appendix D

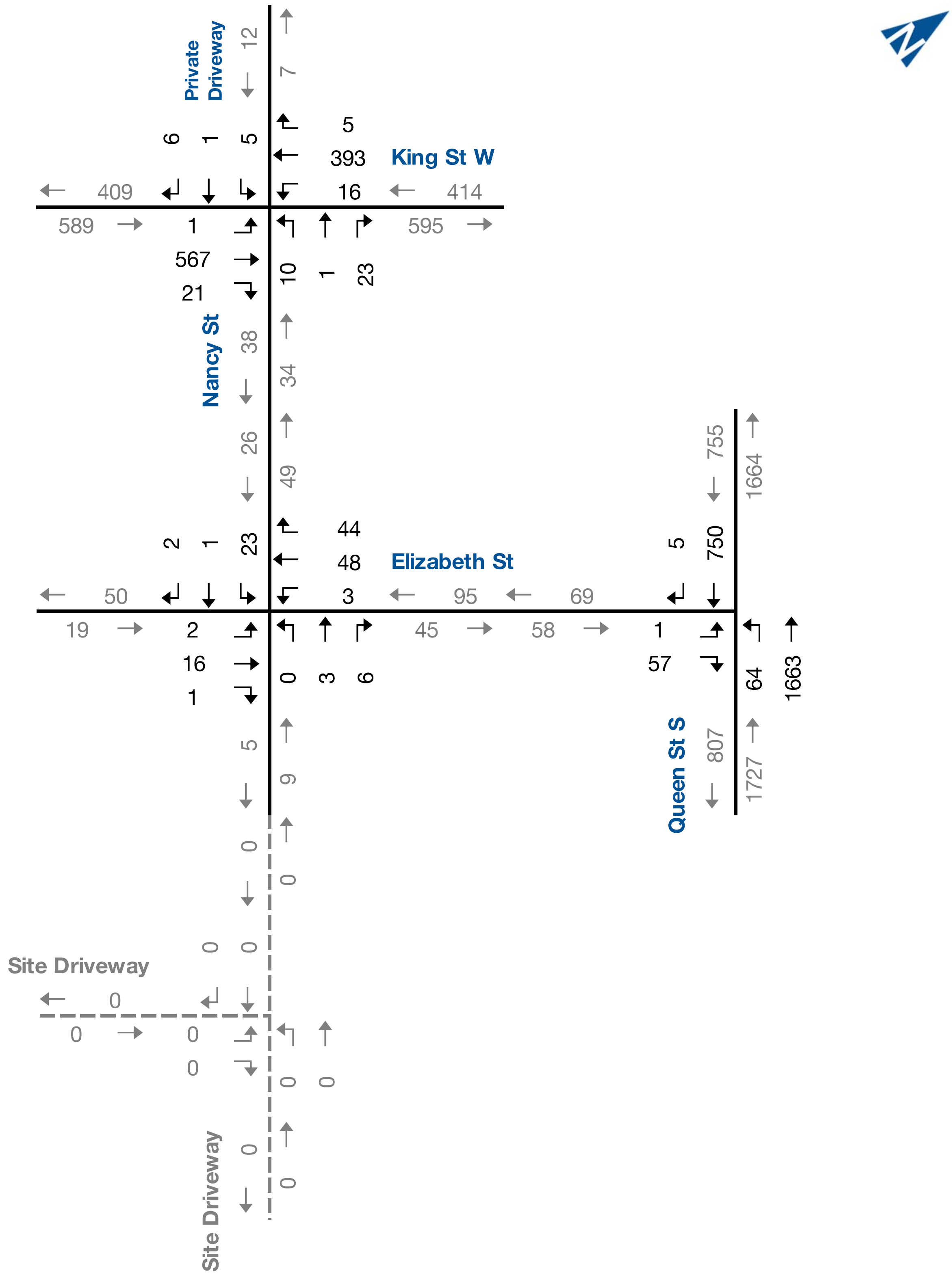
Detailed Background Traffic Forecast



NTS

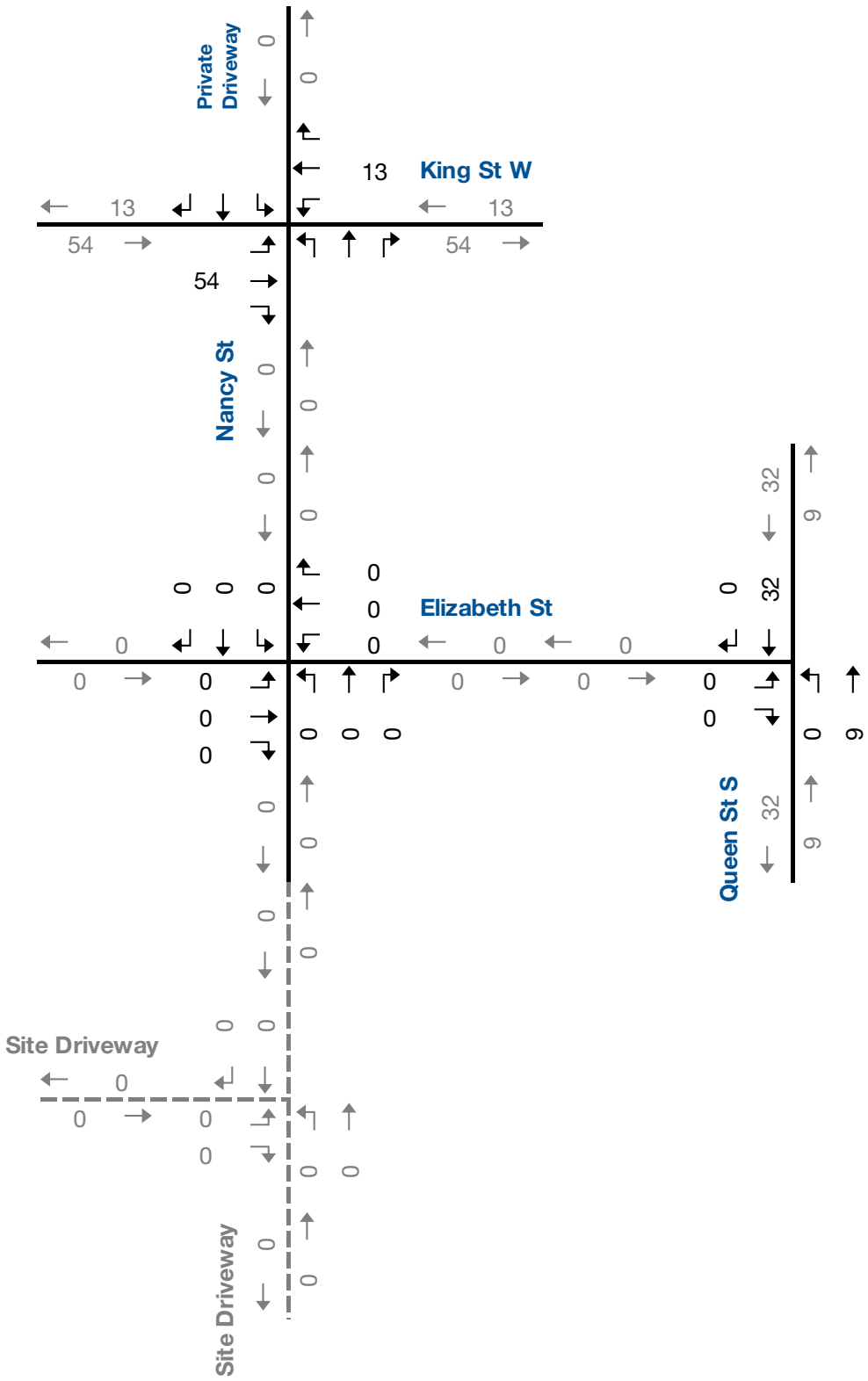
Generalized Background Traffic Growth – AM Peak Hour

84 Nancy Street
180126



Generalized Background Traffic Growth – PM Peak Hour

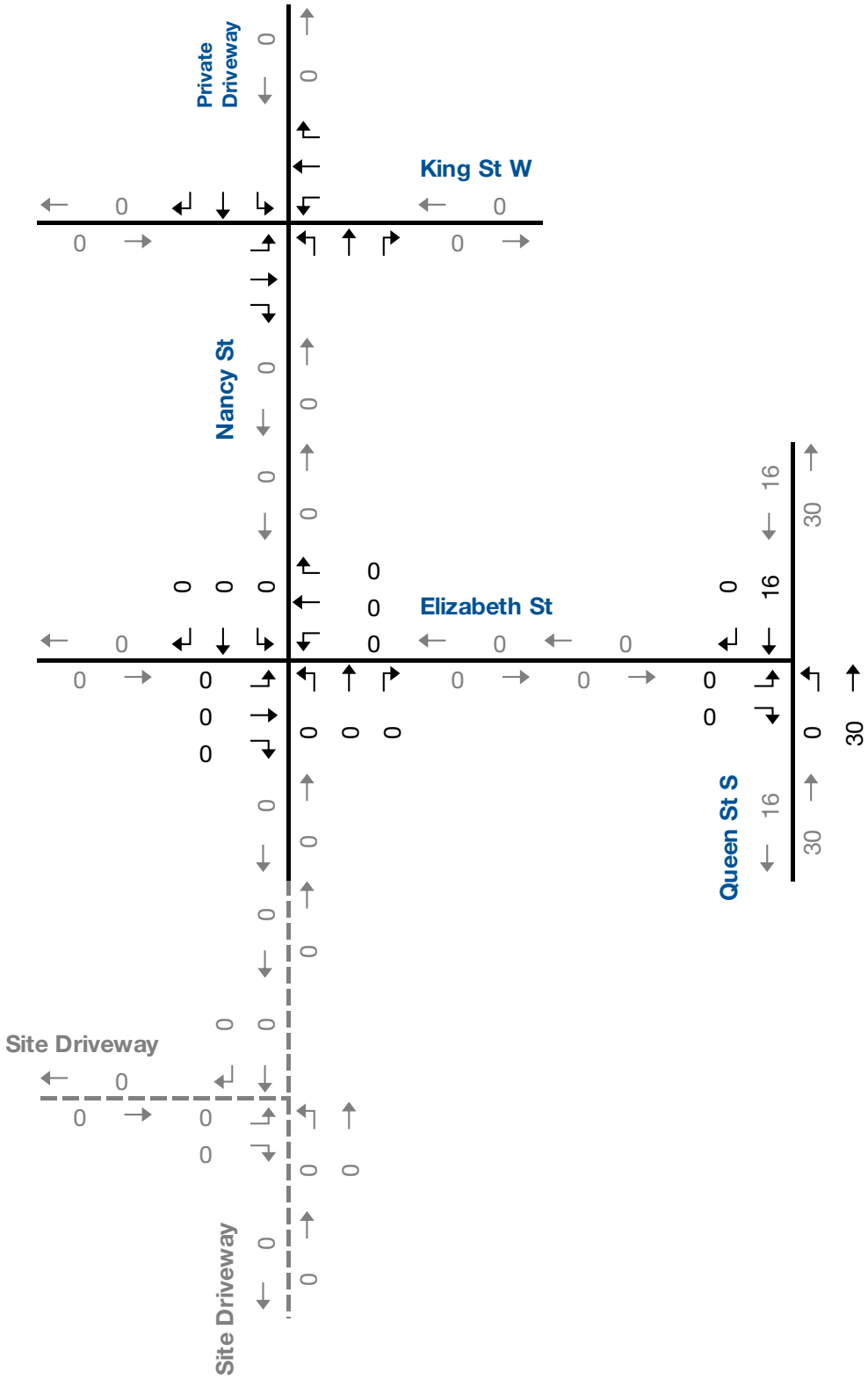
84 Nancy Street
180126



NTS

Adjacent Development Site Traffic – AM Peak Hour

84 Nancy Street
180126



NTS

Adjacent Development Site Traffic – PM Peak Hour

84 Nancy Street
180126

Appendix E

Background Traffic Operational Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	549	9	3	405	2	2	0	10	1	0	1
Future Volume (Veh/h)	2	549	9	3	405	2	2	0	10	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	549	9	3	405	2	2	0	10	1	0	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		31										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	407			558			970	970	554	980	974	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			482			928	928	477	937	932	406
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	98	100	100	100
cM capacity (veh/h)	1152			1000			229	247	544	221	246	645

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	560	410	12	2
Volume Left	2	3	2	1
Volume Right	9	2	10	1
cSH	1152	1000	442	330
Volume to Capacity	0.00	0.00	0.03	0.01
Queue Length 95th (m)	0.0	0.1	0.7	0.1
Control Delay (s)	0.0	0.1	13.4	16.0
Lane LOS	A	A	B	C
Approach Delay (s)	0.0	0.1	13.4	16.0
Approach LOS			B	C

Intersection Summary						
Average Delay	0.3					
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)	0	2	0	0	3	6	1	0	0	2	0	0
Future Volume (vph)	0	2	0	0	3	6	1	0	0	2	0	0
Peak Hour 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
Hourly flow rate (vph)	0	2	0	0	3	6	1	0	0	2	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	2	9	1	2
Volume Left (vph)	0	0	1	2
Volume Right (vph)	0	6	0	0
Hadj (s)	0.03	-0.37	0.23	0.23
Departure Headway (s)	3.9	3.5	4.2	4.2
Degree Utilization, x	0.00	0.01	0.00	0.00
Capacity (veh/h)	904	1009	850	859
Control Delay (s)	7.0	6.6	7.2	7.2
Approach Delay (s)	7.0	6.6	7.2	7.2
Approach LOS	A	A	A	A

Intersection Summary						
Delay	6.8					
Level of Service	A					
Intersection Capacity Utilization	13.3%	ICU Level of Service		A		
Analysis Period (min)	15					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	31	10	541	1285	1
Future Volume (Veh/h)	1	31	10	541	1285	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	31	10	541	1285	1
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	1576	643	1286			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1576	643	1286			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	93	98			
cM capacity (veh/h)	99	416	535			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	190	361	857	429
Volume Left	1	10	0	0	0
Volume Right	31	0	0	0	1
cSH	378	535	1700	1700	1700
Volume to Capacity	0.08	0.02	0.21	0.50	0.25
Queue Length 95th (m)	2.2	0.5	0.0	0.0	0.0
Control Delay (s)	15.4	0.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.4	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	45.6%	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)	1	567	21	16	393	5	10	1	23	5	1	6
Future Volume (Veh/h)	1	567	21	16	393	5	10	1	23	5	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	1	567	21	16	393	5	10	1	23	5	1	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		31										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	398			588			1014	1010	578	1030	1018	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	398			508			971	967	497	989	975	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
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	96	97	100	99
cM capacity (veh/h)	1161			972			208	230	527	195	227	654

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	589	414	34	12
Volume Left	1	16	10	5
Volume Right	21	5	23	6
cSH	1161	972	354	306
Volume to Capacity	0.00	0.02	0.10	0.04
Queue Length 95th (m)	0.0	0.4	2.5	1.0
Control Delay (s)	0.0	0.5	16.2	17.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.0	0.5	16.2	17.2
Approach LOS			C	C

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	43.4%	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)	2	16	1	3	48	44	0	3	6	23	1	2
Future Volume (vph)	2	16	1	3	48	44	0	3	6	23	1	2
Peak Hour 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
Hourly flow rate (vph)	2	16	1	3	48	44	0	3	6	23	1	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	19	95	9	26
Volume Left (vph)	2	3	0	23
Volume Right (vph)	1	44	6	2
Hadj (s)	0.02	-0.24	-0.37	0.16
Departure Headway (s)	4.1	3.8	3.8	4.3
Degree Utilization, x	0.02	0.10	0.01	0.03
Capacity (veh/h)	864	944	910	811
Control Delay (s)	7.2	7.2	6.8	7.4
Approach Delay (s)	7.2	7.2	6.8	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.2	
Level of Service			A	
Intersection Capacity Utilization			20.6%	ICU Level of Service
Analysis Period (min)			15	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	57	64	1693	766	5
Future Volume (Veh/h)	1	57	64	1693	766	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	57	64	1693	766	5
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	1743	386	771			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1743	386	771			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	91	92			
cM capacity (veh/h)	72	613	840			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	58	628	1129	511	260
Volume Left	1	64	0	0	0
Volume Right	57	0	0	0	5
cSH	542	840	1700	1700	1700
Volume to Capacity	0.11	0.08	0.66	0.30	0.15
Queue Length 95th (m)	2.9	2.0	0.0	0.0	0.0
Control Delay (s)	12.4	2.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.4	0.7		0.0	
Approach LOS	B				

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			83.6%	ICU Level of Service	E
Analysis Period (min)			15		

Appendix F

Total Traffic Operational Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	549	15	5	405	2	4	0	18	1	0	1
Future Volume (Veh/h)	2	549	15	5	405	2	4	0	18	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	2	549	15	5	405	2	4	0	18	1	0	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		31										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	407			564			978	978	556	994	984	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			487			935	935	479	953	942	406
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	97	100	100	100
cM capacity (veh/h)	1152			994			226	244	542	212	241	645

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	566	412	22	2
Volume Left	2	5	4	1
Volume Right	15	2	18	1
cSH	1152	994	432	319
Volume to Capacity	0.00	0.01	0.05	0.01
Queue Length 95th (m)	0.0	0.1	1.3	0.2
Control Delay (s)	0.0	0.2	13.8	16.3
Lane LOS	A	A	B	C
Approach Delay (s)	0.0	0.2	13.8	16.3
Approach LOS			B	C

Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	41.0%	ICU Level of Service		A		
Analysis Period (min)	15					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	2	0	7	3	6	1	10	30	2	8	0
Future Volume (vph)	0	2	0	7	3	6	1	10	30	2	8	0
Peak Hour 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
Hourly flow rate (vph)	0	2	0	7	3	6	1	10	30	2	8	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	2	16	41	10
Volume Left (vph)	0	7	1	2
Volume Right (vph)	0	6	30	0
Hadj (s)	0.03	-0.10	-0.40	0.07
Departure Headway (s)	4.0	3.9	3.5	4.0
Degree Utilization, x	0.00	0.02	0.04	0.01
Capacity (veh/h)	871	907	1006	879
Control Delay (s)	7.1	7.0	6.7	7.1
Approach Delay (s)	7.1	7.0	6.7	7.1
Approach LOS	A	A	A	A

Intersection Summary						
Delay	6.8					
Level of Service	A					
Intersection Capacity Utilization	17.1%	ICU Level of Service		A		
Analysis Period (min)	15					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	59	16	541	1285	2
Future Volume (Veh/h)	3	59	16	541	1285	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	59	16	541	1285	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)						
pX, platoon unblocked						
vC, conflicting volume	1588	644	1287			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1588	644	1287			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	86	97			
cM capacity (veh/h)	96	416	535			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	62	196	361	857	430
Volume Left	3	16	0	0	0
Volume Right	59	0	0	0	2
cSH	358	535	1700	1700	1700
Volume to Capacity	0.17	0.03	0.21	0.50	0.25
Queue Length 95th (m)	4.9	0.7	0.0	0.0	0.0
Control Delay (s)	17.2	1.3	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	17.2	0.5		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	20	7	7
Future Volume (Veh/h)	20	0	0	20	7	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	1.00	1.00
Hourly flow rate (vph)	22	0	0	22	7	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	32	10	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	10	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	986	1077	1604			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	22	14
Volume Left	22	0	0
Volume Right	0	0	7
cSH	986	1604	1700
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	13.3%	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)	1	567	30	22	393	5	13	1	30	5	1	6
Future Volume (Veh/h)	1	567	30	22	393	5	13	1	30	5	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour 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
Hourly flow rate (vph)	1	567	30	22	393	5	13	1	30	5	1	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		31										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	398			597			1030	1026	582	1054	1038	396
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	398			516			988	983	500	1014	997	396
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			94	100	94	97	100	99
cM capacity (veh/h)	1161			963			201	223	524	184	219	654

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	598	420	44	12
Volume Left	1	22	13	5
Volume Right	30	5	30	6
cSH	1161	963	348	293
Volume to Capacity	0.00	0.02	0.13	0.04
Queue Length 95th (m)	0.0	0.6	3.4	1.0
Control Delay (s)	0.0	0.7	16.8	17.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.0	0.7	16.8	17.8
Approach LOS			C	C

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	48.2%	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)	2	16	1	31	48	44	0	13	23	23	16	2
Future Volume (vph)	2	16	1	31	48	44	0	13	23	23	16	2
Peak Hour 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
Hourly flow rate (vph)	2	16	1	31	48	44	0	13	23	23	16	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	19	123	36	41
Volume Left (vph)	2	31	0	23
Volume Right (vph)	1	44	23	2
Hadj (s)	0.02	-0.13	-0.35	0.12
Departure Headway (s)	4.2	4.0	3.9	4.4
Degree Utilization, x	0.02	0.14	0.04	0.05
Capacity (veh/h)	830	889	880	796
Control Delay (s)	7.3	7.6	7.1	7.6
Approach Delay (s)	7.3	7.6	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary					
Delay	7.5				
Level of Service	A				
Intersection Capacity Utilization	28.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	74	90	1693	766	7
Future Volume (Veh/h)	1	74	90	1693	766	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	74	90	1693	766	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	1796	386	773			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1796	386	773			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	88	89			
cM capacity (veh/h)	64	612	838			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	654	1129	511	262
Volume Left	1	90	0	0	0
Volume Right	74	0	0	0	7
cSH	549	838	1700	1700	1700
Volume to Capacity	0.14	0.11	0.66	0.30	0.15
Queue Length 95th (m)	3.8	2.9	0.0	0.0	0.0
Control Delay (s)	12.6	2.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.6	1.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		85.4%	ICU Level of Service	E
Analysis Period (min)		15		

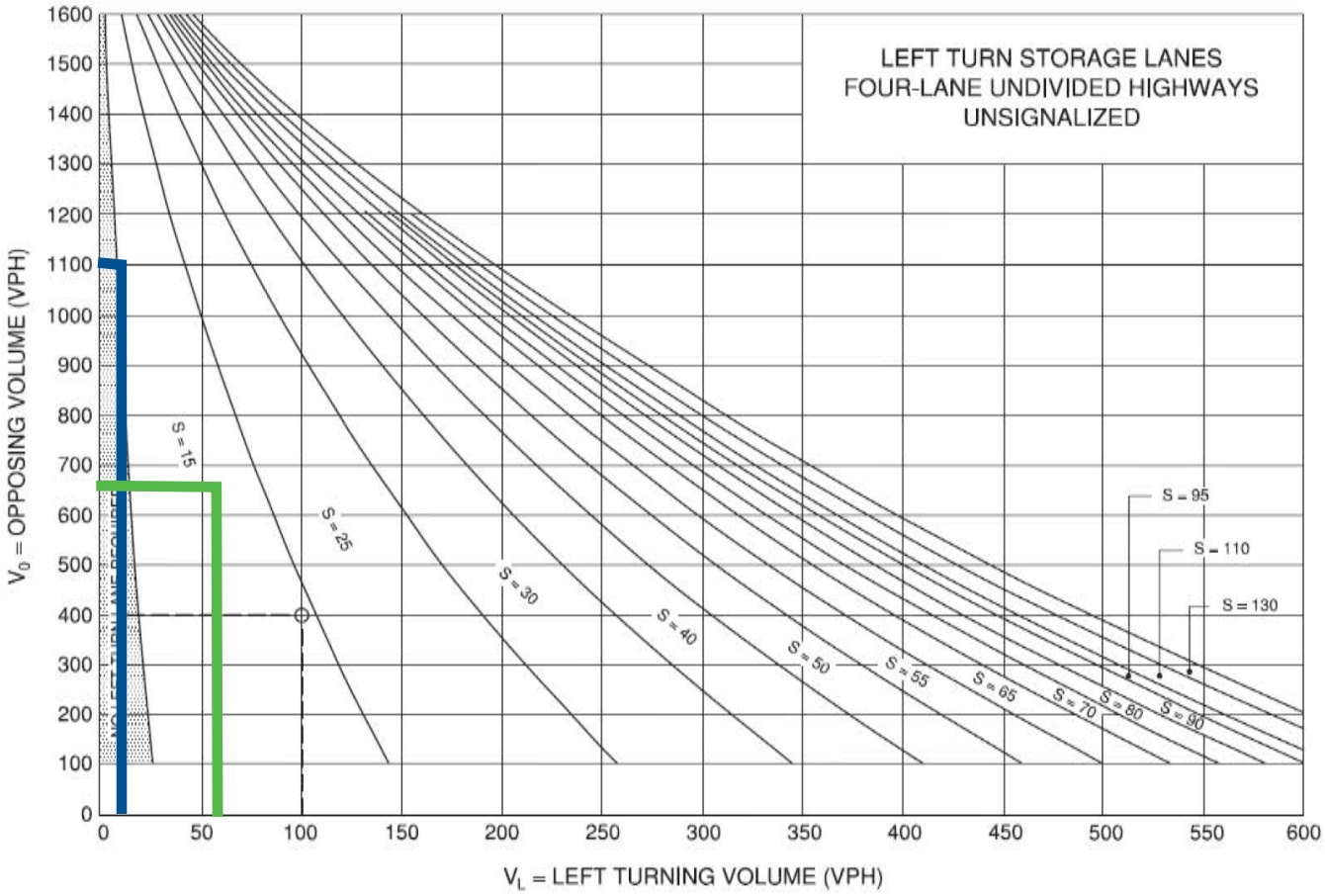
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	0	0	13	22	21
Future Volume (Veh/h)	14	0	0	13	22	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	14	0	0	13	22	21
Pedestrians						
Lane Width (m)						
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	46	32	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46	32	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	970	1047	1579			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	13	43
Volume Left	14	0	0
Volume Right	0	0	21
cSH	970	1579	1700
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		1.8		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

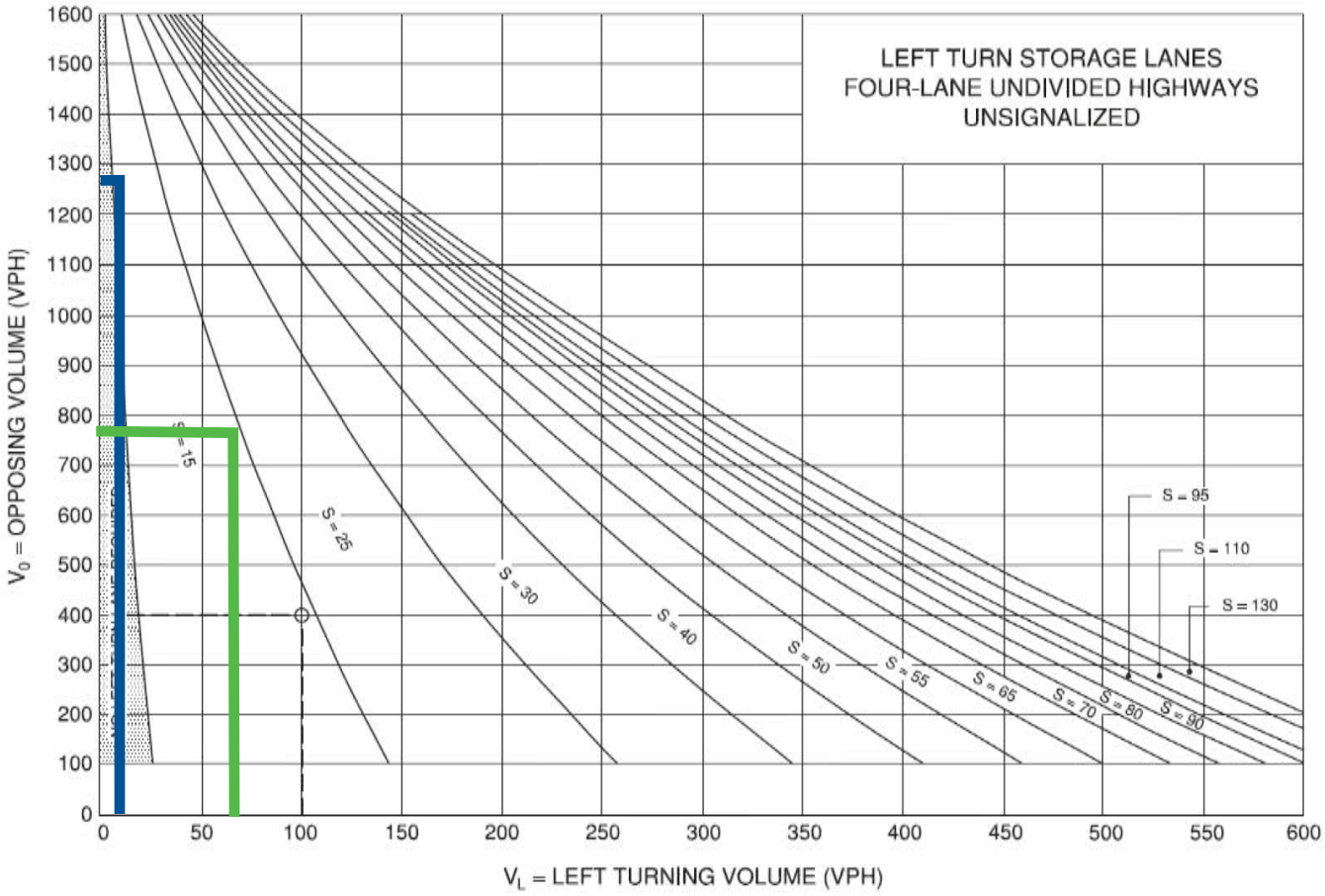
Appendix G

Left-Turn Lane Warrants



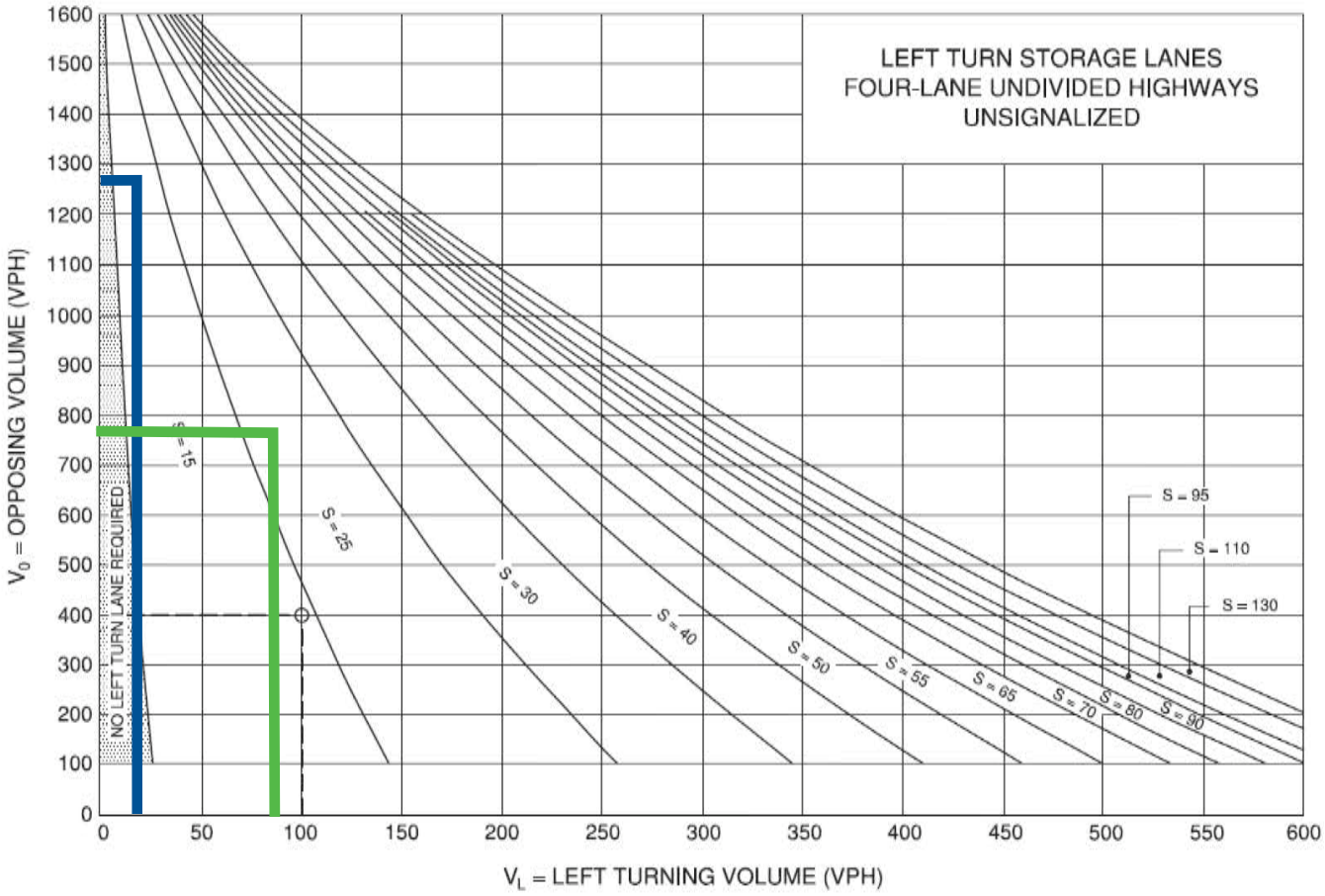
AM Peak Hour
PM Peak Hour

Location: Queen St S & Elizabeth Street
Direction: Northbound Left-Turn
Horizon Year: Existing Traffic



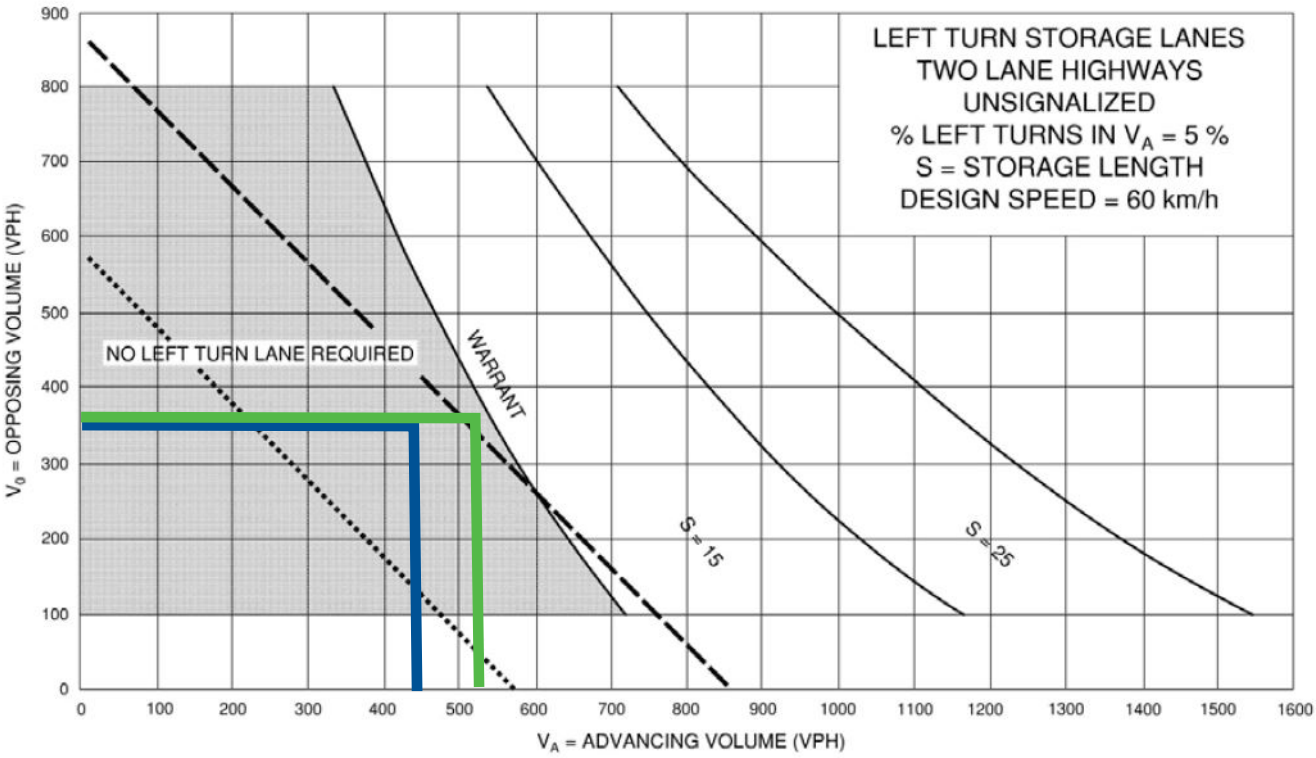
AM Peak Hour
PM Peak Hour

Location: Queen St S & Elizabeth Street
Direction: Northbound Left-Turn
Horizon Year: Background Traffic



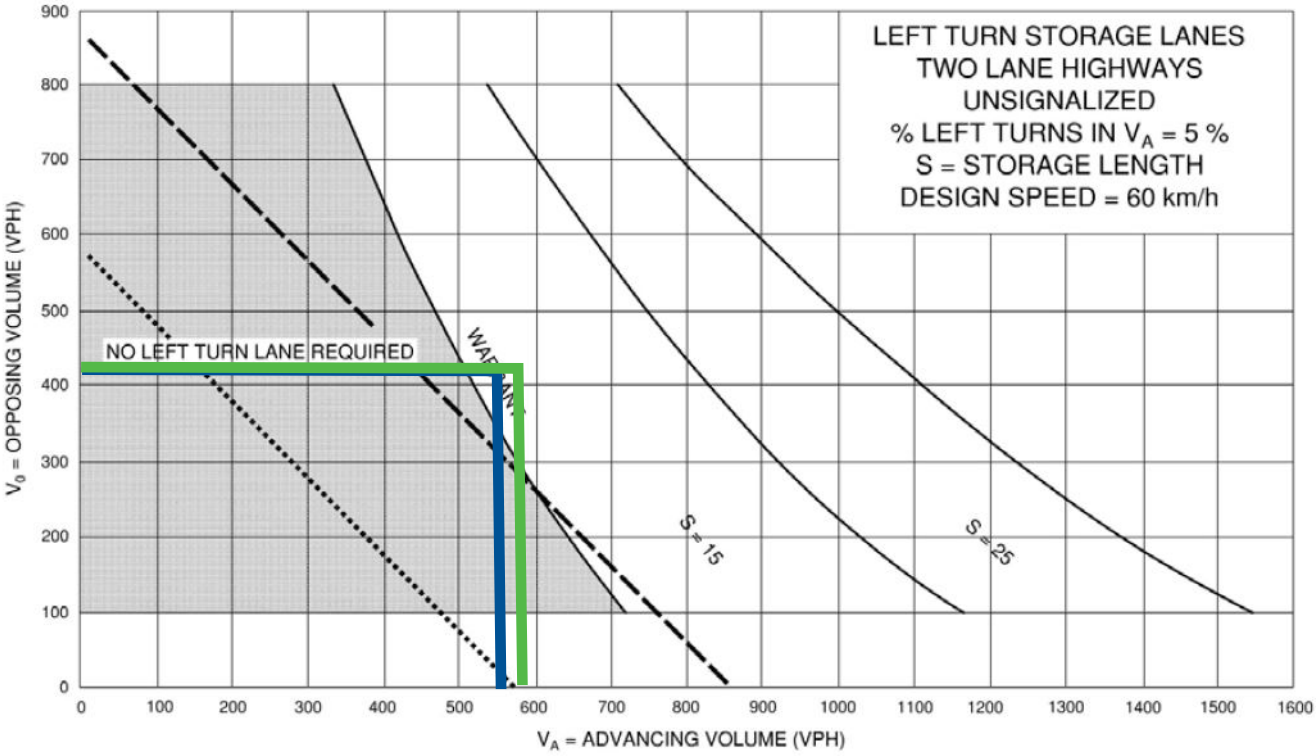
AM Peak Hour
PM Peak Hour

Location: Queen St S & Elizabeth Street
Direction: Northbound Left-Turn
Horizon Year: Total Traffic



AM Peak Hour
PM Peak Hour

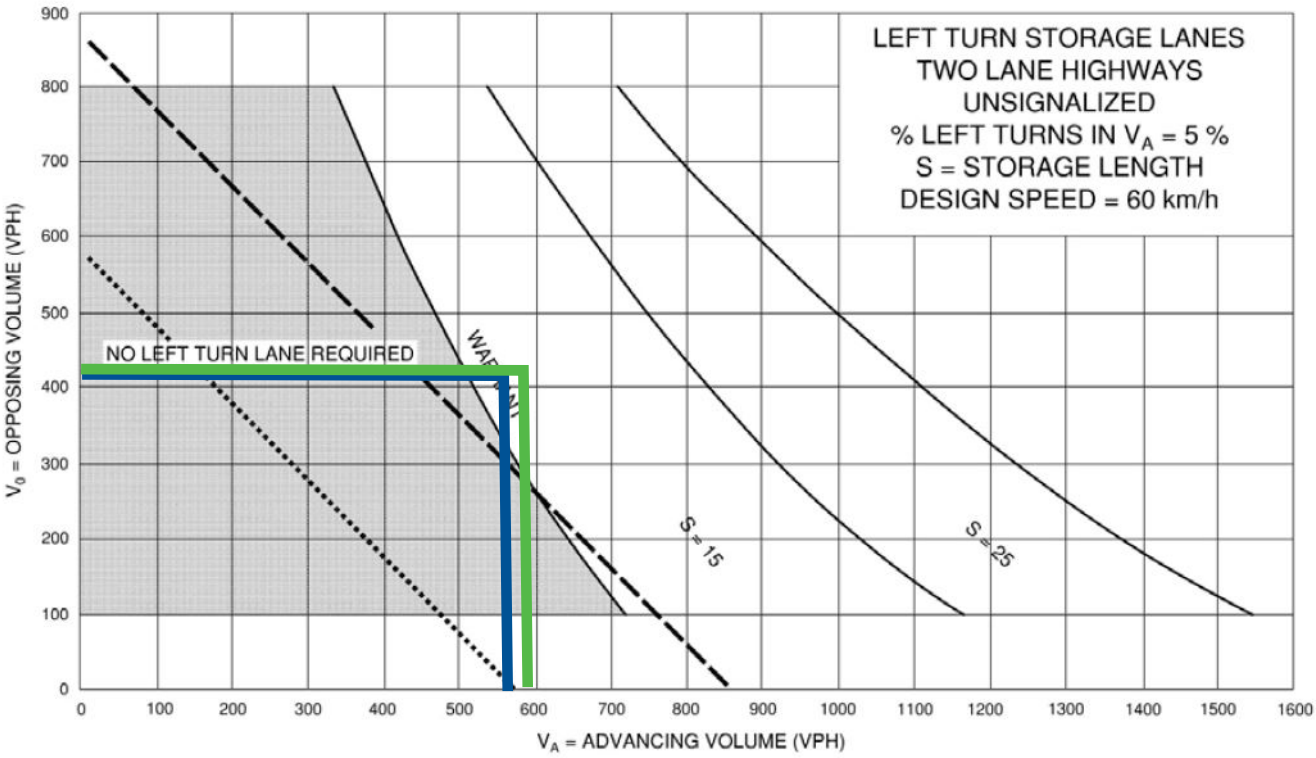
Location: King Street W & Nancy Street
Direction: Eastbound Left-Turn
Horizon Year: Existing Traffic



Note: Left-turning traffic accounts for less than 1.0% of advancing design hour volumes

AM Peak Hour
PM Peak Hour

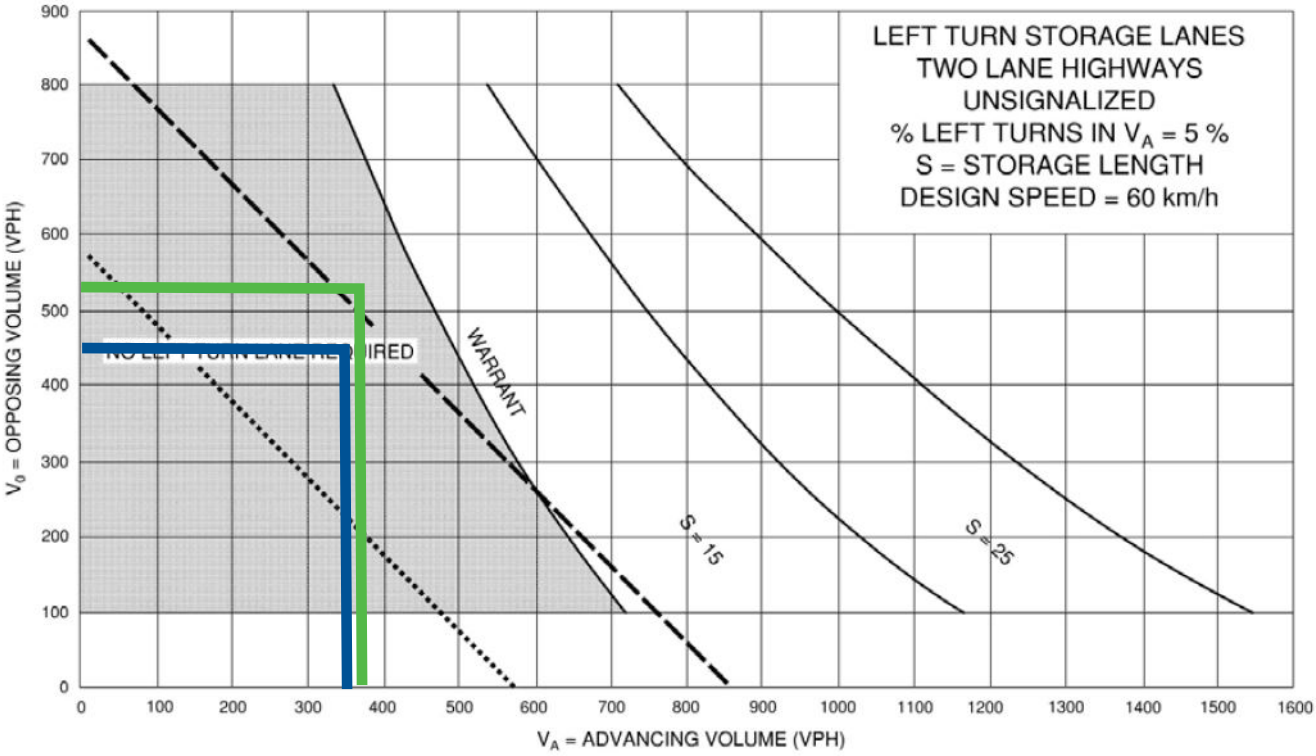
Location: King Street W & Nancy Street
Direction: Eastbound Left-Turn
Horizon Year: Background Traffic



Note: Left-turning traffic accounts for less than 1.0% of advancing design hour volumes

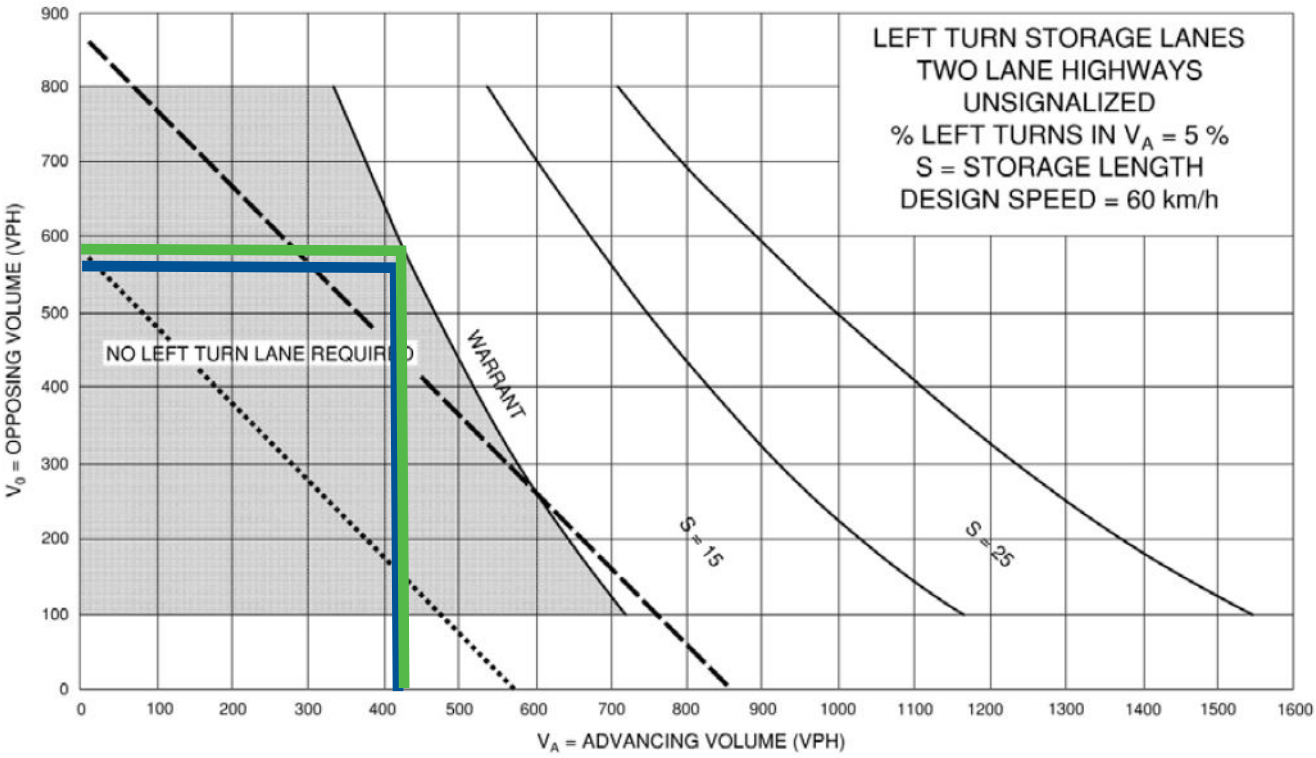
AM Peak Hour
PM Peak Hour

Location: King Street W & Nancy Street
Direction: Eastbound Left-Turn
Horizon Year: Total Traffic



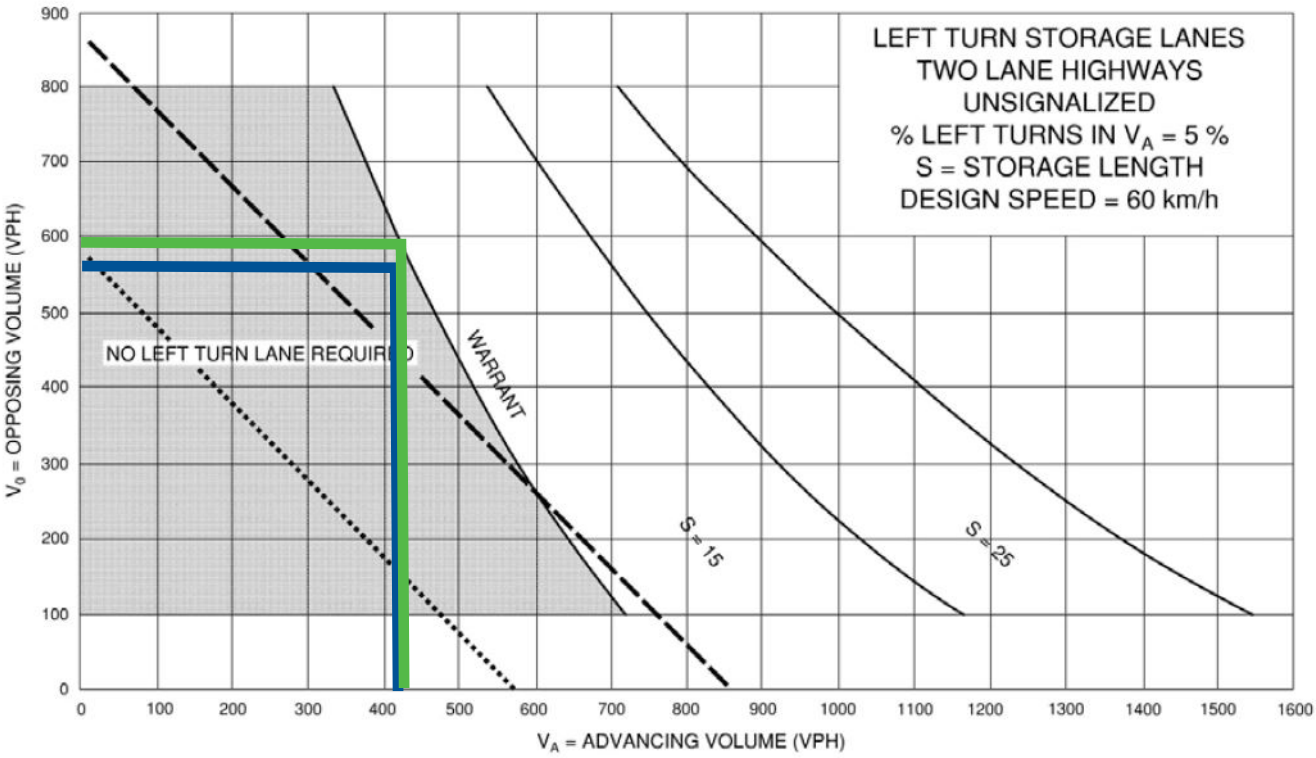
AM Peak Hour
PM Peak Hour

Location: King Street W & Nancy Street
Direction: Westbound Left-Turn
Horizon Year: Existing Traffic



AM Peak Hour
PM Peak Hour

Location: King Street W & Nancy Street
Direction: Westbound Left-Turn
Horizon Year: Background Traffic



AM Peak Hour
PM Peak Hour

Location: King Street W & Nancy Street
Direction: Westbound Left-Turn
Horizon Year: Total Traffic

Appendix H

Parking Study Data

Municipal Address:	**1284 Guelph Line**
	Burlington, ON L7L 4X5
Name:	**Mod'rn**
Type:	**Stacked Townhouse**
Units	**78**
Occupied	75
Parking Supply	**111**
Residents	83
Visitors	27
Car Share	1
Parking Supply Ratio	
Spaces/Unit	1.42
Resident spaces/unit	1.08
Visitor spaces/unit	0.35
Parking Rate (occupied)	
Day 1	
Visitor	0.17
Resident	0.69
Overall	**0.84**
Day 2	
Visitor	0.24
Resident	0.68
Overall	**0.92**

Wednesday - 13 April 2016				
Time	**Visitors**	**Residents**	**Car Share**	**Total**
16:00	11	13	1	25
16:15	9	17	1	27
16:30	11	15	1	27
16:45	13	17	1	31
17:00	12	19	1	32
17:15	10	20	1	31
17:30	7	25	1	33
17:45	9	29	1	39
18:00	9	32	1	42
18:15	10	35	1	46
18:30	9	38	1	48
18:45	13	39	1	53
19:00	12	42	1	55
19:15	10	45	1	56
19:30	12	45	1	58
19:45	10	44	1	55
20:00	13	43	1	57
20:15	13	42	1	56
20:30	12	44	1	57
20:45	12	46	1	59
21:00	**13**	47	1	61
21:15	12	49	1	62
21:30	11	50	1	62
21:45	11	**51**	1	63
22:00	12	50	**1**	**63**

Thursday - 14 April 2016				
Time	**Visitors**	**Residents**	**Car Share**	**Total**
16:00	7	14	1	**22**
16:15	7	19	1	**27**
16:30	5	19	1	**25**
16:45	5	19	1	**25**
17:00	4	18	1	**23**
17:15	4	20	1	**25**
17:30	5	23	1	**29**
17:45	7	23	1	**31**
18:00	8	25	1	**34**
18:15	8	28	1	**37**
18:30	9	31	1	**41**
18:45	9	34	1	**44**
19:00	9	36	1	**46**
19:15	8	35	1	**44**
19:30	10	36	1	**47**
19:45	10	39	1	**50**
20:00	10	41	1	**52**
20:15	11	42	1	**54**
20:30	12	42	1	**55**
20:45	15	44	1	**60**
21:00	14	47	1	**62**
21:15	16	48	1	**65**
21:30	17	50	1	**68**
21:45	18	50	1	**69**
22:00	**18**	**50**	**1**	**69**

NOTE: Car share is assumed to be related to the Resident demand only.

Municipal Address:	**1284 Guelph Line**
	Burlington, ON L7L 4X5
Name:	**Mod'rn**
Type:	**Stacked Townhouse**
Units	**78**
Occupied	70
Parking Supply	**111**
Residents	83
Visitors	27
Car Share	1
Parking Supply Ratio	
Spaces/Unit	1.42
Resident spaces/unit	1.08
Visitor spaces/unit	0.35
Parking Rate (occupied)	
Day 1 - 17 August 2016	
Visitor	0.10
Resident	0.87
Total	**0.96**
Day 2 - 23 April 2016	
Visitor	0.14
Resident	0.93
Total	**1.07**

Wednesday - 17 August 2016					
Time	**Visitors**	**Adj. Visitor**	**Residents**	**Car Share**	**Total**
16:00	8	2	26	1	**29**
16:15	10	4	27	1	**32**
16:30	12	5	30	1	**36**
16:45	10	3	28	1	**32**
17:00	9	2	29	1	**32**
17:15	8	1	33	1	**35**
17:30	8	1	34	1	**36**
17:45	8	1	34	1	**36**
18:00	9	1	46	1	**48**
18:15	9	2	46	1	**49**
18:30	10	2	46	1	**49**
18:45	10	2	46	1	**49**
19:00	13	4	47	1	**52**
19:15	13	4	48	1	**53**
19:30	11	2	43	1	**46**
19:45	11	2	44	1	**47**
20:00	12	2	47	1	**50**
20:15	13	3	49	1	**53**
20:30	16	6	50	1	**57**
20:45	16	6	55	1	**62**
21:00	16	6	56	1	**63**
21:15	17	7	56	1	**64**
21:30	17	7	57	1	**65**
21:45	17	**7**	58	1	**66**
22:00	16	6	**60**	**1**	**67**

NOTE: Car share is assumed to be related to the Resident demand only.

Tuesday - 23 August 2016					
Time	**Visitors**	**Adj. Visitor**	**Residents**	**Car Share**	**Total**
16:00	3	1	32	1	**34**
16:15	6	4	30	1	**35**
16:30	6	4	29	1	**34**
16:45	6	4	31	1	**36**
17:00	6	4	34	1	**39**
17:15	8	6	36	1	**43**
17:30	11	7	40	1	**48**
17:45	10	6	40	1	**47**
18:00	9	5	39	1	**45**
18:15	8	3	42	1	**46**
18:30	8	3	43	1	**47**
18:45	7	2	43	1	**46**
19:00	7	2	45	1	**48**
19:15	7	2	46	1	**49**
19:30	8	2	47	1	**50**
19:45	7	2	47	1	**50**
20:00	7	2	46	1	**49**
20:15	7	2	49	1	**52**
20:30	7	2	50	1	**53**
20:45	6	1	52	1	**54**
21:00	7	2	56	1	**59**
21:15	8	3	58	1	**62**
21:30	11	6	59	1	**66**
21:45	10	5	60	1	**66**
22:00	11	6	62	1	**69**
22:15	13	8	61	1	**70**
22:30	13	8	62	1	**71**
22:45	14	9	63	1	**73**
23:00	14	9	63	1	**73**
23:15	14	9	64	1	**74**
23:30	15	10	63	1	**74**
23:45	15	10	63	1	**74**
00:00	15	**10**	**64**	**1**	**75**

NOTE: Car share is assumed to be related to the Resident demand only.