Existing Conditions Report

Lakeshore Connecting Communities

City of Mississauga

October 25, 2016

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List of Acronyms

ANSI	Areas of Natural and Scientific Interest
BLOS	Bicycling Level of Service
CN	Community Node
CVC	Credit Valley Conservation
DMG	Data Management Group
EA	Environmental Assessment
GTHA	Greater Toronto and Hamilton Area
HCM 2000	Highway Capacity Manual 2000
LTS	Level of Traffic Stress
MEA	Municipal Engineers Association
MMLOS	Multi-Modal Level of Service
NHD	Neighbourhood District
OD	Origin Destination
OHA	Ontario Heritage Act
OT	Oakville Transit
PETSI	Pedestrian Exposure to Traffic at Signalized Intersections
PLOS	Pedestrian Level of Service
PPS	Provincial Policy Statement
PSI	Potential for Safety Improvement
PSW	Provincially Significant Wetland
QEW	Queen Elizabeth Way
ROW	Right-of-way
SWH	Significant Wildlife Habitat
TCRP	Transit Cooperative Highway Research Program
TCQSM	Transit Capacity and Quality Service Manual
TMP	Transportation Master Plan
TRB	Transportation Research Board
TRCA	Toronto and Region Conservation Authority
TTC	Toronto Transit Commission
TTS	Transportation Tomorrow Survey
TWCLTL	Two-way centre-left-turn lane
V/C	Volume/Capacity

1 Introduction

The City of Mississauga is undertaking the Lakeshore Connecting Communities Study to guide the planning of Lakeshore Road (Southdown Road to the east City limit) as well as Royal Windsor Drive (Southdown Road to the west City limit) ("the Study Corridor") to provide a unified and seamless vision that recognizes the different character areas and to support all modes of transportation, connect people to places and move goods to market, and support existing and future land uses as well as establish an implementation plan to make the vision a reality.

The study will deliver a transportation master plan (TMP) and implementation strategy for the Study Corridor and will be completed in accordance with Phase 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

This report describes the existing context of the Study Corridor, including: land use, built form, transportation, natural and socio-economic characteristics.

1.1 Study Purpose

The purpose of Lakeshore Connecting Communities is to:

- Articulate a vision for the Study Corridor as developed through recent planning initiatives (i.e. Clarkson Village Study, Inspiration Lakeview, Inspiration Port Credit, and the Port Credit and Lakeview Local Area Plans);
- Determine the long term transportation needs and function of the Study Corridor based on projected population and employment growth;
- Assess the need and timing of higher order transit between Hurontario Street and the east City limit, as well as extending rapid transit into the Port Credit area; and
- Identify policy, operational and physical improvements for the Study Corridor.

1.2 Study Objective

Lakeshore Connecting Communities will inform land use and corridor design decisions as they relate to the ongoing applications for intensification and redevelopment in the Study Corridor and the City and Region of Peel capital plans.

1.3 Study Process

Lakeshore Connecting Communities will satisfy the requirements for the Master Plan process as shown in **Exhibit 1-1** and as described in the Municipal Class Environmental Assessment (EA) document (June 2000, as amended in 2007, and 2015) prepared by the Municipal Engineers Association (MEA).

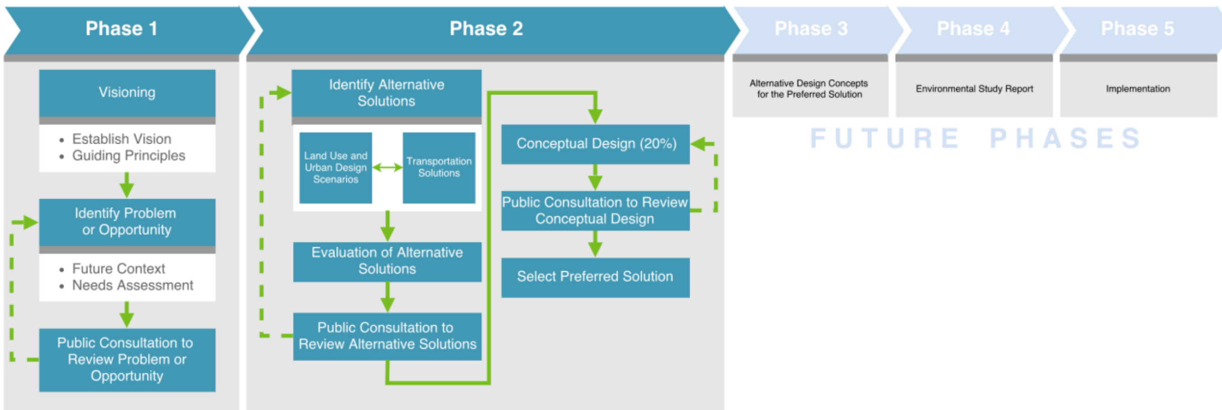


Exhibit 1-1: Master Plan Process

1.4 Study Area

The study area can be defined as three areas, as shown in **Exhibit 1-2**:

1. **Strategic Analysis Area** – The area is bounded by the Queen Elizabeth Way (QEW) to the north, the east City boundary, Lake Ontario, and Winston Churchill Boulevard or the west City boundary. It represents the overall strategic area to be considered for transportation assessment of alternative scenarios to capture influences from surrounding freeways, regional roads, and transit routes.

2. **Network Analysis Area** – The area is bounded by the railway corridor to the north, the east City boundary, Lake Ontario, and Winston Churchill Boulevard or the west City boundary. It represents the area to be considered for microscopic traffic simulation to capture local influences from surrounding local roads and trip generators/attractors.

3. **Study Corridor** – Defined as Lakeshore Road from Southdown Road to the east City limit and Royal Windsor Drive from Southdown Road to the west City limit (approximately 13 kilometres).

This report will document existing conditions within the **Study Corridor** and **Network Analysis Area**. Overall travel demand and land use will be described at the **Strategic Analysis Area**.

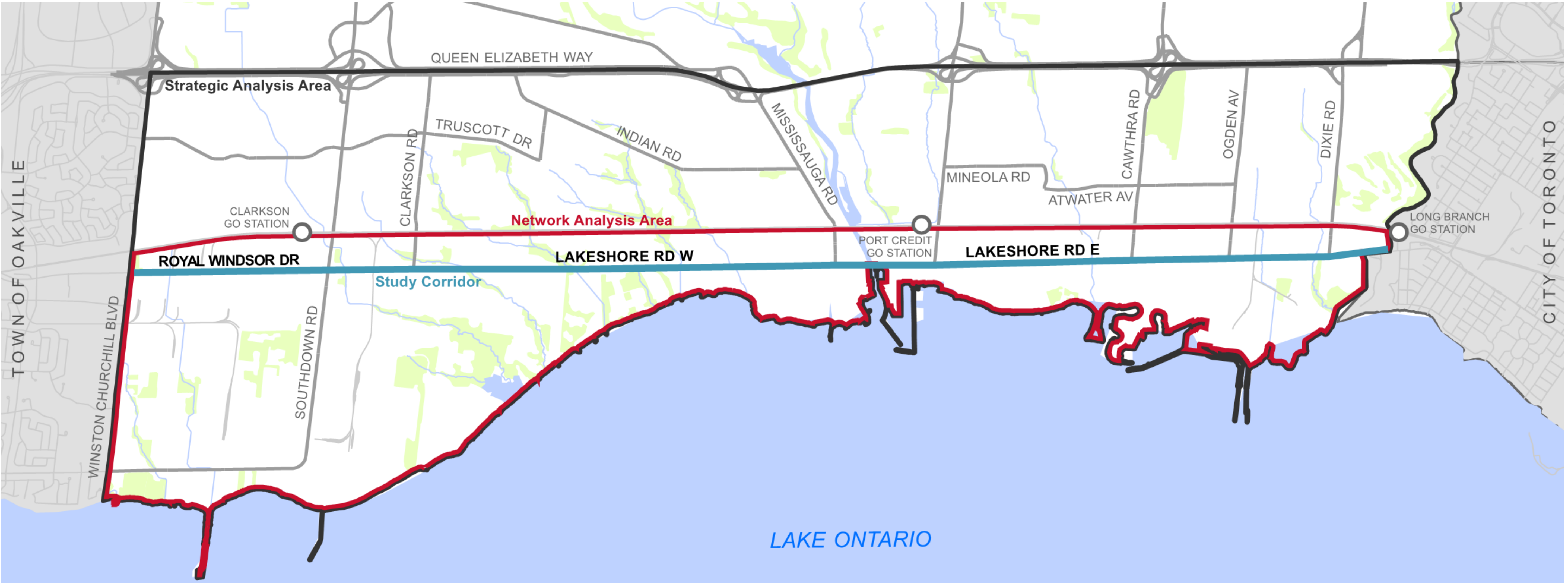


Exhibit 1-2: Study Area

2 Land Use and Built Form

2.1 Land Use

The Lakeshore Corridor traverses the City of Mississauga in an east-west direction and runs through the historic communities of Clarkson, Lorne Park, Port Credit and Lakeview. The Network Analysis Area encompasses approximately 1976 gross hectares and is bounded by the rail corridor located approximately 360 metres north of Lakeshore Road to the north, Lake Ontario to the south, the east City boundary and the west City boundary. The following section summarizes existing and projected population and employment growth for the Network Analysis Area and describes the existing land use.

2.1.1 Existing Land Use

Exhibit 2-1 identifies the existing land use in the study area, while **Table 2-1** summarizes the area in hectares of each existing land use within each character area traversed by Lakeshore Road. The following provides a description of the existing land use, including a brief geographic description, major land use characteristics, and key properties, with emphasis given to the properties immediately adjacent to Lakeshore Road.

SOUTHDOWN EMPLOYMENT AREA

This character area is generally bounded by the rail corridor to the north, Lake Ontario to the south, Winston Churchill Boulevard to the west, and Southdown Road and a point just west of Apple Lane to the east. The Southdown EA area is made up of a number of large properties consisting mainly of heavy and general industrial uses including several large Suncor Energy facilities and the Clarkson Wastewater Treatment Plant. The corridor area also contains an office building and a substantial amount of open space and park area. The intersection of Southdown Ave and Royal Windsor Drive contains a number of commercial retail properties including a Canadian Tire/Metro/Shoppers Drug Mart shopping centre, a permanent fruit and vegetable market, a garden centre and the Ontario Racquet Club.

CLARKSON VILLAGE CN

The rail corridor and Turtle Glen Park form the boundary for this character area to the north, while Lushes Avenue and the rear of the fronting properties are on the south. To the west this area is generally bounded by Southdown Road, and it extends to a point just east of Meadow Wood Road to the east. The uses fronting on Lakeshore Road generally consist of larger parcels containing commercial plazas, stand-alone stores and a few 2-3 storey mixed residential/commercial developments. The eastern end of the character area contains a small section of 2 storey "main street" commercial on the north side of Lakeshore Road between Clarkson Road North and Meadow Woods Road. The western end of the character area contains several clusters of large townhouse developments as well as a number of 8 to 21 storey apartment buildings. The community and cultural uses in this area include a place of worship located on the south side of Lakeshore Road, and several parks and open space areas located throughout the area.

CLARKSON-LORNE PARK NHD

This character area is generally bounded by the rail corridor to the north, Lake Ontario to the south, Southdown Road and the Clarkson Village Character Area to the west. It extends to a point just east of Raintree Lane and Crozier Court. Development in the vicinity of Lakeshore Road is predominantly single detached residential with some semi-detached, townhouses and apartments generally located on the western side of the character area. The majority of the residential properties in proximity to Lakeshore Road either back onto, or flank the street, with only a few properties gaining direct access from Lakeshore Road. There is a small amount retail commercial uses along the corridor, mainly located adjacent to, and extending Clarkson Village. Located throughout the area are a number of schools, places of worship, as well as a substantial park and open space system that includes Jack Darling Memorial Park and Rattray Marsh Conservation Area.

PORT CREDIT NHD WEST

This character area is bounded by the rail corridor to the north and Lake Ontario to the south. Its western boundary is generally located at a point just west of Shawnmar Road, while its eastern boundary is located at Mississauga Road North on the north side of Lakeshore Road, and Front Street South on the south side of Lakeshore Road. The corridor area consists of a range of building forms including apartment buildings ranging in height from 3 to 7 storeys, a large townhouse development near the western boundary and a large vacant property between Lakeshore Road and Lake Ontario (the former Imperial Oil site to be redeveloped). The commercial development generally consists of small stand-alone buildings with the exception of a large commercial development containing a Loblaw's as well as five smaller commercial units on separate pads. Community uses located throughout this character area but away from the Lakeshore Road corridor include a school, and a number of open space and park areas including JC Saddington Park and Brueckner Rhododendron Gardens.

PORT CREDIT CN

The Port Credit CN character area is generally bounded by the rail corridor to the north, Lake Ontario to the south, Mississauga Road N and Front Street S. to the west, and Rosewood Road and Elmwood Avenue S. to the east. The central portion of the corridor generally consists of 2 storey "main street" retail commercial uses, several with residential above. Higher density forms of mixed residential/commercial in the range of 5 to 22 storeys can be found on the western and eastern edges of the corridor, as well as just behind the fronting properties. Community and cultural uses within this area includes the Port Credit Library adjacent the corridor, while the Port Credit Harbour Marina, Port Credit Arena, canoe and rowing clubs along the Credit River, several schools and a number of places of worship are located throughout the area. There is also a substantial amount of public parkland and open space, some located adjacent the corridor, but mainly located throughout the area.

PORT CREDIT NHD EAST

The Port Credit NHD East character area is generally bounded by the rail corridor to the north, Lake Ontario to the south, Rosewood Road and Elmwood Avenue S. to the west, and Seneca Ave to the east. The corridor area is dominated by 2 storey "main street" mixed commercial/residential along with several 3 storey apartment buildings that dot the corridor. The remainder of the area consists primarily of detached residential with several schools and various employment uses adjacent to the rail corridor.

LAKEVIEW NHD

The portion of the Lakeview NHD character area located within the study area is generally bounded by the rail corridor to the north, Lake Ontario to the south, Seneca Ave. to the west, and the eastern City limit and Lakeview EA Character Area to the east. The corridor area consists of a mix of 1-2 storey retail commercial and mixed residential/commercial uses along with several 5 to 7 storey apartment buildings fronting onto Lakeshore Road. The area also contains several larger retail commercial developments such as the Metro/Beer Store plaza located on the western edge of the character area, while further east there is also a large commercial plaza containing a Shoppers Drug Mart and Dollarama along with a number of smaller stores within the plaza. Adjacent the Shoppers Drug Mart, a new retail development is currently under construction. The remainder of the area generally consists of detached residential, as well as a number of industrial properties located near the rail corridor and the Lakeview Water Treatment Plant adjacent the Lake. Community and cultural uses located adjacent the corridor include several places of worship and schools. Other community uses located throughout this character area include the Blythe Academy, Army Navy &

Airforce Veterans Club, the Lakefront Promenade Marina, Port Credit Yacht Club and RK McMillan Park.

LAKEVIEW EMPLOYMENT AREA

This character area is generally bounded by Lakeshore Road to the north, Lake Ontario to the south, East Ave. to the west, and the city limits to the east. The Lakeview EA character area consists of primarily industrial uses, but also contains a number of open space and park areas. Lakeshore Road provides access to the adjacent properties, but the uses are set well back from the street. This area also contains several large parcels that appear to be vacant (former Lakeview Generating Station).

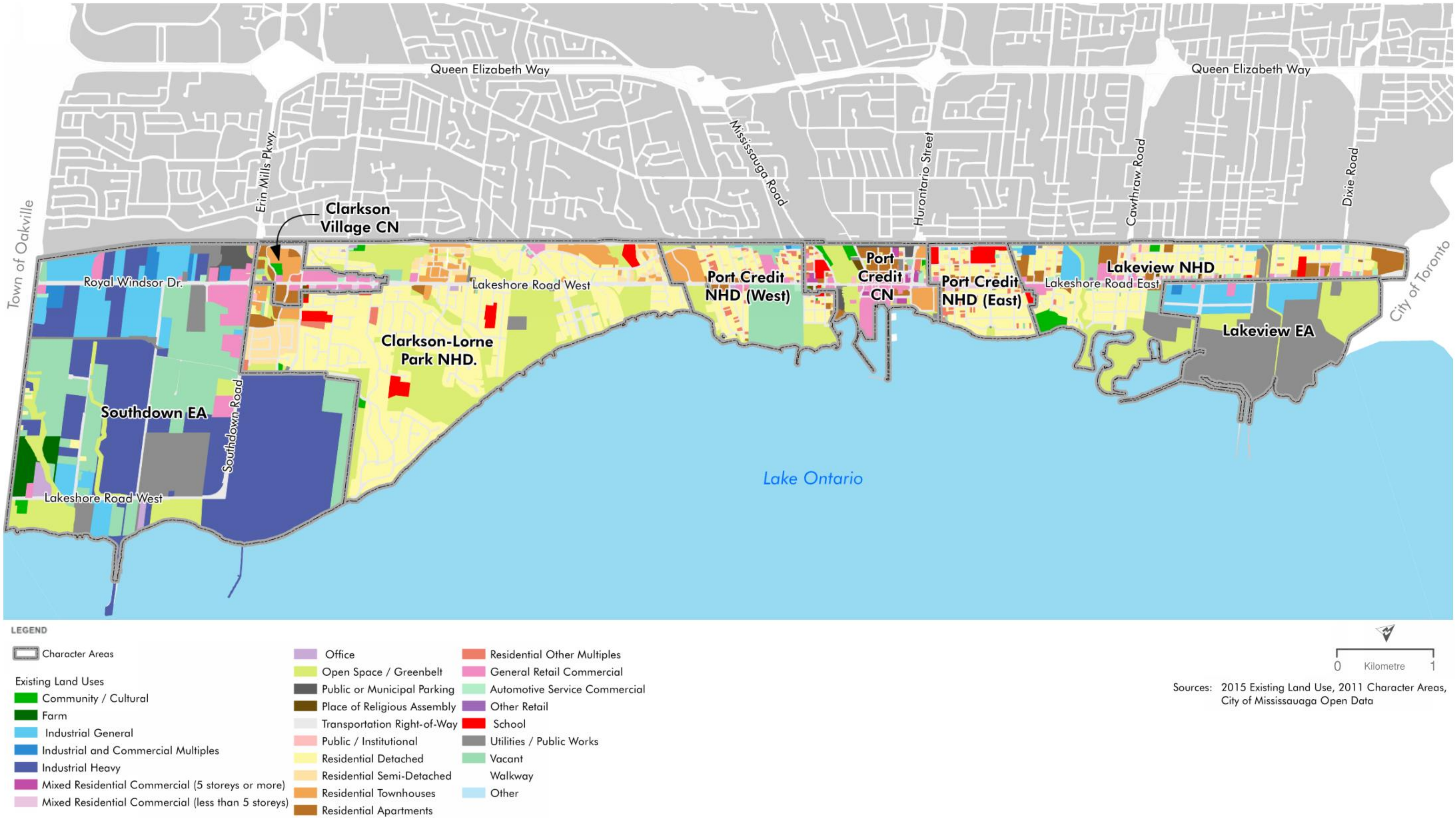


Exhibit 2-1: Existing Land Use

Table 2-2: Existing Land Use by Character Area (Area in Hectares)

Land Use Designation	Clarkson Village CN	Port Credit CN	Clarkson - Lorne Park NHD	Lakeview NHD	Port Credit NHD (East)	Port Credit NHD (West)	Lakeview EA	Southdown EA	Total
RESIDENTIAL	**12.2**	**17.2**	**257.7**	**85.9**	**40.6**	**45.6**	**0**	**2.1**	**461.4**
Residential Detached	0	1.6	213.4	64	36	29.7	0	2.1	346.9
Residential Semi-Detached	0	0.1	18.3	1.9	0.5	0.8	0	0	21.5
Residential Townhouse	5.5	5.5	19	1.6	0	9.1	0	0	40.8
Residential Apartments	6.1	7.9	4	17.4	1.7	2.4	0	0	39.6
Residential Other Multiples	0.6	2.1	3	1	2.4	3.6	0	0	12.6
TRANSPORTATION RIGHT-OF-WAY	**10.7**	**17.9**	**106.3**	**49.2**	**20.8**	**21.2**	**8.5**	**37.3**	**271.8**
INDUSTRIAL	**0**	**0**	**0**	**10.3**	**0.4**	**1.3**	**30**	**386.7**	**428.7**
Industrial General	0	0	0	8.9	0.4	1.1	29.2	79	118.5
Industrial and Commercial Multiples	0	0	0	1.4	0	0.2	0.8	9.9	12.3
Industrial Heavy	0	0	0	0	0	0	0	297.8	297.8
OPEN SPACE / GREENBELT	**1.5**	**16.4**	**143.6**	**38.8**	**0.9**	**16.2**	**35.2**	**47.5**	**300.1**
SCHOOL / PUBLIC / INSTITUTIONAL	**0**	**2.4**	**10.7**	**1.9**	**6.3**	**0.5**	**0**	**0.4**	**22.2**
School	0	1.9	10.4	1.6	6.3	0.4	0	0	20.6
Public / Institutional	0	0.5	0.3	0.3	0	0.1	0	0.4	1.6
COMMERCIAL / OFFICE / MIXED USE	**11.7**	**17.5**	**3.2**	**13.8**	**4.3**	**6.8**	**1**	**32.9**	**91.1**
General Retail Commercial	8.9	11.2	1.9	9.2	0.6	4.5	1	26.2	63.5
Automotive Service Commercial	0.2	0.5	0.4	2.1	0.3	0.9	0	0.7	5.2
Other Retail	0.4	0	0	0.1	0	0	0	0	0.5
Residential Commercial =/> than 5 Storeys	0	3.2	0	0	0	0	0	0	3.2
Mixed Residential Commercial< 5 Storeys	1.2	1.2	0	2.1	2.9	0.8	0	0	8.2
Office	1	1.4	0.9	0.3	0.5	0.6	0	6	10.6
VACANT / FARM	**0.4**	**0.3**	**2.3**	**9.7**	**0.3**	**33**	**0**	**154.8**	**200.9**
Vacant	0.4	0.3	2.3	9.7	0.3	33	0	141.1	187.2
Farm	0	0	0	0	0	0	0	13.7	13.7
UTILITY / PUBLIC WORKS	**0**	**1.1**	**2.9**	**12**	**0.1**	**0.2**	**99.2**	**57.3**	**172.8**
COMMUNITY / PLACE OF RELIGIOUS ASSEMBLY	**1.3**	**4**	**2.6**	**6.5**	**0**	**0.2**	**0**	**1.9**	**16.4**
Place of Religious Assembly	0.3	1.1	0.7	0.5	0	0.1	0	0	2.6
Community / Cultural	1	2.9	1.9	6	0	0.1	0	1.9	13.8
OTHER	**0**	**3.7**	**0.4**	**0.1**	**0.3**	**0.1**	**0**	**5.9**	**10.5**
Walkway	0	0	0.3	0	0	0	0	0	0.3
Other	0	0.1	0.1	0.1	0	0	0	0	0.3
Public or Municipal Parking	0	3.6	0	0	0.3	0.1	0	5.9	9.9
TOTAL	**37.8**	**80.5**	**529.4**	**228.2**	**74**	**125**	**174**	**726.9**	**1975.9**

Sources: 2015 Existing Land Use, 2011 Character Areas - City of Mississauaga Open Data

2.1.2 Population and Employment

Table 2-3 summarizes the 2011 population and employment as well as the 2041 forecast population and employment growth within the Network Analysis Area based on City of Mississauga character areas. These figures are used herein when describing existing population and employment as well as future growth trends for each of the character areas within the Network Analysis Area. It is noted that for the Clarkson-Lorne Park Neighbourhood District (NHD) and Lakeview NHD character areas, existing and forecasted population and employment are overstated as the forecasts apply to the character area in its entirety rather than just the portion located within the Network Analysis Area. With a 2011 population of over 76,000, the Network Analysis Area accounts for approximately 10% of the total population of the City of Mississauga. In regards to employment, there were approximately 16,000 jobs as of 2011, which accounted for approximately 3.5% of the employment of Mississauga. Significant growth in population and jobs is anticipated over the next twenty years. The population is forecast to increase by 55,885 people and represents a 73% increase while the City as a whole is forecast to increase by 165,000 people, a 22% increase. Employment is forecast to increase by 16,488 jobs and represents a 76% increase in employment, while the overall city increase is 115,000 jobs, a 26% increase.

The gross population and employment density by character area for 2011 (i.e. number of persons or jobs as a proportion of the total character area) is illustrated in **Exhibit 2-2** and **Exhibit 2-3** respectively. High density development is prominent within Clarkson Village Community Node (CN), Port Credit CN, and Lakeview NHD; whereas other character areas are primarily low density residential. There is also a high concentration of jobs within the Clarkson Village CN and Port Credit CN; whereas jobs are more dispersed within the Southdown and Lakeview Employment Areas.

Table 2-3: Population and Employment (2011 to 2041)

Character Area	Population					Employment				
	2011	2041	Change			2011	2041	Change		
			Pop.	% Change	Annual Growth Rate			Emp.	% Change	Annual Growth Rate
Clarkson Village CN	2,400	3,200	800	33%	1.0%	1,300	1,800	500	38%	1.1%
Port Credit CN	6,700	16,756	10,056	150%	3.1%	2,300	5,092	2,792	121%	2.7%
Clarkson - Lorne Park NHD	38,800	40,500	1,700	4%	0.1%	3,800	4,300	500	13%	0.4%
Lakeview NHD	22,600	45,429	22,829	101%	2.4%	4,900	11,296	6,396	131%	2.8%
Port Credit NHD	5,800	15,300	9,500	164%	3.3%	1,600	5,600	4,000	250%	4.3%
Lakeview EA	-	11,000	11,000	-	-	1,800	2,100	300	17%	0.5%
Southdown EA	-	-	-	-	-	5,900	7,900	2,000	34%	1.0%
Study Area Total	76,300	132,185	55,885	73%	1.8%	21,600	38,088	16,488	76%	1.9%
City of Mississauga Total	743,000	908,000	165,000	22%	0.7%	448,000	563,000	115,000	26%	0.8%
Study Area as a % of Mississauga Total	10.3%	14.6%	33.9%	-	-	4.8%	6.8%	14.3%	-	-

Source: Mississauga Long-Range Growth Forecasts Population, 2011-2041-Hemson Consulting Ltd.
Mississauga Long-Range Growth Forecasts Employment, 2011-2041-Hemson Consulting Ltd.
City of Mississauga, July 2016

Exhibit 2-2: Gross Population Density by Character Area (2011)

Exhibit 2-3: Gross Employment Density by Character Area (2011)

2.2 Built Form

The Study Corridor is approximately 13 kilometres in length and is highly diverse. To better address this diversity, and inform a context-sensitive approach to the TMP, the Study Corridor is organized into a series of character areas, based on existing urban structure, and patterns of built form.

The character areas along Lakeshore Road are termed either “Community Nodes”, which are substantially commercial or mixed commercial-residential in use, “Neighbourhoods”, which are substantially residential and “Employment Areas”.

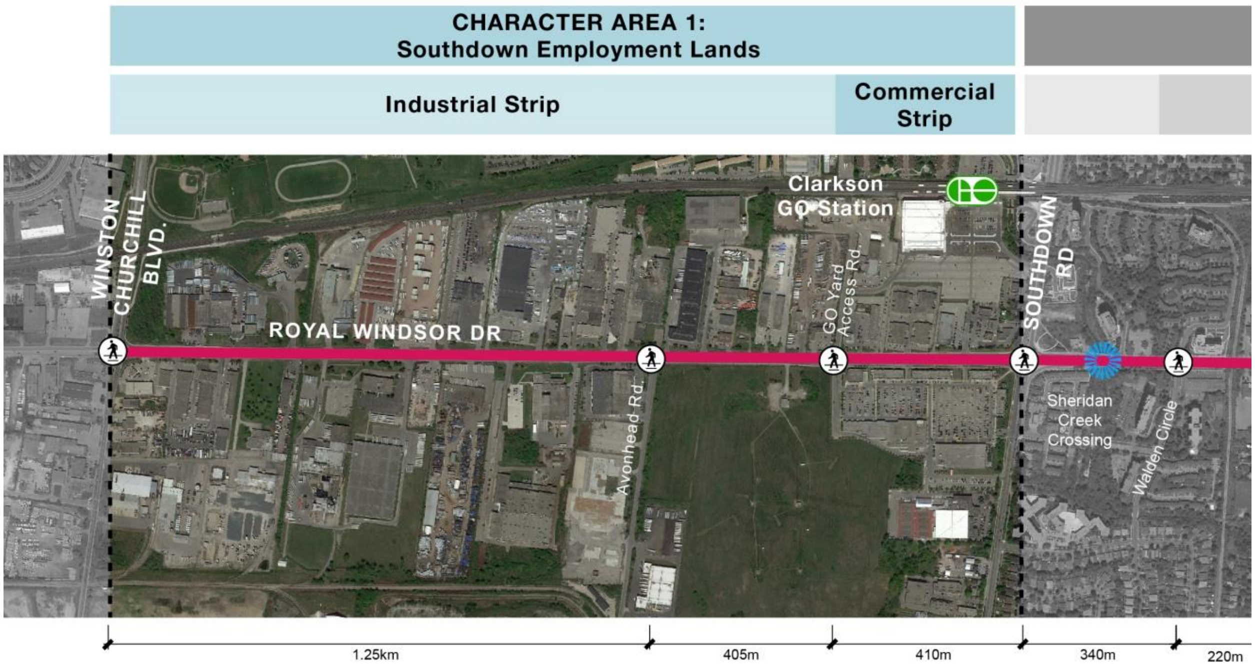
Eight character areas have been identified along the corridor, including a number of varied neighbourhoods and communities that are focused along Lakeshore Road. These include the historic villages of Clarkson, Lorne Park, Port Credit and Lakeview, as well as the new mixed-use developments and employment lands at the east and west boundaries of the City. The wide landscaped boulevards, woodlots, creeks and waterway crossings and the proximity to the Lake Ontario waterfront are notable, character-defining elements of the corridor.

A chart summarizing the land use at grade, road cross-section elements, cycling facilities, sidewalks, streets, blocks, and crossings, and the user profile with photos is included in **Appendix A**.


CHARACTER AREA 1
CHARACTER AREA 2
CHARACTER AREA 3
CHARACTER AREA 4
CHARACTER AREA 5
CHARACTER AREA 6
CHARACTER AREA 7
CHARACTER AREA 8
Clarkson GO Station
Port Credit GO Station
Longbranch GO Station
Imperial Oil Lands
CLC Lands
Lakeview
LAKE ONTARIO
Winston Churchill Boulevard
Southdown Road
Johnson's Lane
Godfrey's Lane
Mississauga Road
Elmwood Avenue
Seneca Avenue
East Avenue
Etobicoke Creek
LEGEND
Lakeshore Road
Signalized Intersection
Bridge / Water Crossing
Waterfront Trail
Go Station
Parks / Open Space
Lake Water Bodies
Community Node Character Area
Neighbourhood Character Area
Employment Lands Character Area
Development Lands

2.2.1 Character Area 1: Southdown Road Employment Lands

Character Area 1 extends 2 kilometres along Royal Windsor Drive, from the western boundary of the City of Mississauga, between Winston Churchill Boulevard and Southdown Road. This character area is dominated by heavy vehicular traffic, and is further divided into two areas including the industrial strip at the west end and the commercial strip at the east end of the segment.



INDUSTRIAL STRIP

The westernmost portion of the study area is primarily an auto-oriented commercial-industrial strip dominated by vehicular traffic. The 1.6 kilometre long street edge has little animation and the road accommodates predominantly transitory users.

Land Use at Grade:

This section of the study area is dominated by 1 to 2-storey industrial and large-scale commercial warehouse-type buildings with wide landscaped setbacks, shipping yards, parking lots and auto dealerships.

General Condition on the Street:

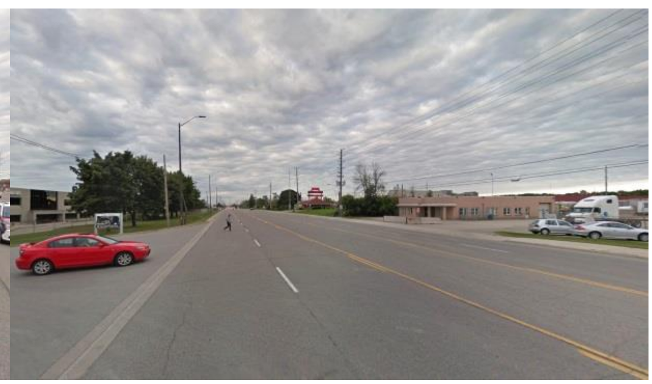
Buildings are set far back with large landscaped setbacks, front parking lots and fences. There is a large vacant brownfield lot on the south side of Lakeshore Road, east of Avonhead Road, which creates a green edge to the street, despite being fenced from public access. There is also a small fenced area of open space on private property on the south side of Royal Windsor Drive east of Winston Churchill Boulevard.

Wide Landscaped Setbacks

Fenced open space on South Side of Road (private property)

There is no sidewalk on the south side of the road between Winston Churchill Boulevard and Avonhead Road. In this section, the south side has a narrow concrete kill strip and intermittent bus stop slabs. East of Avonhead Road, there is a narrow sidewalk adjacent to the curb. On the north side, there is a narrow sidewalk adjacent to the curb for the length of this segment. Driveways into properties are very wide, to accommodate large truck movements, but also encouraging turning movements into the properties at high speeds.

No Sidewalks on South Side



Wide Driveways

The road has a five lane cross section with a continuous centre two-way-left-turn lane (CTWLTL). There is no lay-by or on-street parking and no cycling facilities in this area, but there are large parking lots / shipping yards and front parking lots on both sides of the street.


Vacant Lot on South Side **Industrial / Commercial Yards**

The scale of streets and blocks is very large, with north-south streets intersecting Royal Windsor Drive at an average distance of 405 metres. Crosswalks are located at signalized intersections at Winston Churchill Boulevard and Avonhead Road (approx. 1.25 kilometres apart).

User Profile:

The road is used primarily by vehicular traffic and commercial transports moving at moderate to high speeds with very few controls and stops. The width of lanes and overall roadway allows vehicles to exceed speed limits. The majority of vehicular use is non-local traffic moving through the area rather than into the area as a destination.

There is a low intensity of pedestrian and cyclist use in this area. The very long blocks, long crossing distances, narrow sidewalks, lack of sidewalks along the south side of the street, lack of any cycling facility and fast roadway speeds creates an environment not suited for pedestrians and cyclists. However, the wide landscaped setbacks and proximity to the Waterfront Trail at Southdown Road offer some potential for the introduction of a multi-use path that could connect to the Waterfront Trail on Southdown Road.

COMMERCIAL STRIP

This 425 metres long portion of Royal Windsor Drive between the Clarkson GO Access Road and Southdown Road transitions to a more typical auto oriented suburban commercial strip, with back-lotted retail, and small-scale commercial with front parking lots.

Land Use at Grade:

This section of the study area is dominated by 1 to 2-storey commercial properties. On the north side is more typical strip retail with front parking lots, and on the south side is a retail complex that is back-lotted onto Lakeshore Road, with a false frontage along the road.

General Condition on the Street:

East of the Clarkson GO Yard Access Road, the south sidewalk is separated from the road by a grassy boulevard with street trees planted at the back of the sidewalk, along the retail frontage. The driveway into the retail complex on the south side of the road is channelized, as is the intersection at Southdown Road, making east-west pedestrian travel dangerous. There is a narrow sidewalk adjacent to the curb on the north side of the road.

North Side Strip Retail

South Side Channelized Driveway

The road has a five lane cross section with a continuous CTWLTL. There is no lay-by or on-street parking and no cycling facilities in this area, but there are front parking lots for the strip commercial properties on the north side of the road.

The scale of streets and blocks is moderate, with few intersections. The average distance between north-south streets intersecting Royal Windsor Drive is 215 metres. Crosswalks are located at signalized intersections at Avonhead Road, at the Clarkson GO Yard Access Road (approx. 405 metres apart) and at Southdown Road (approx. 410 metres apart).

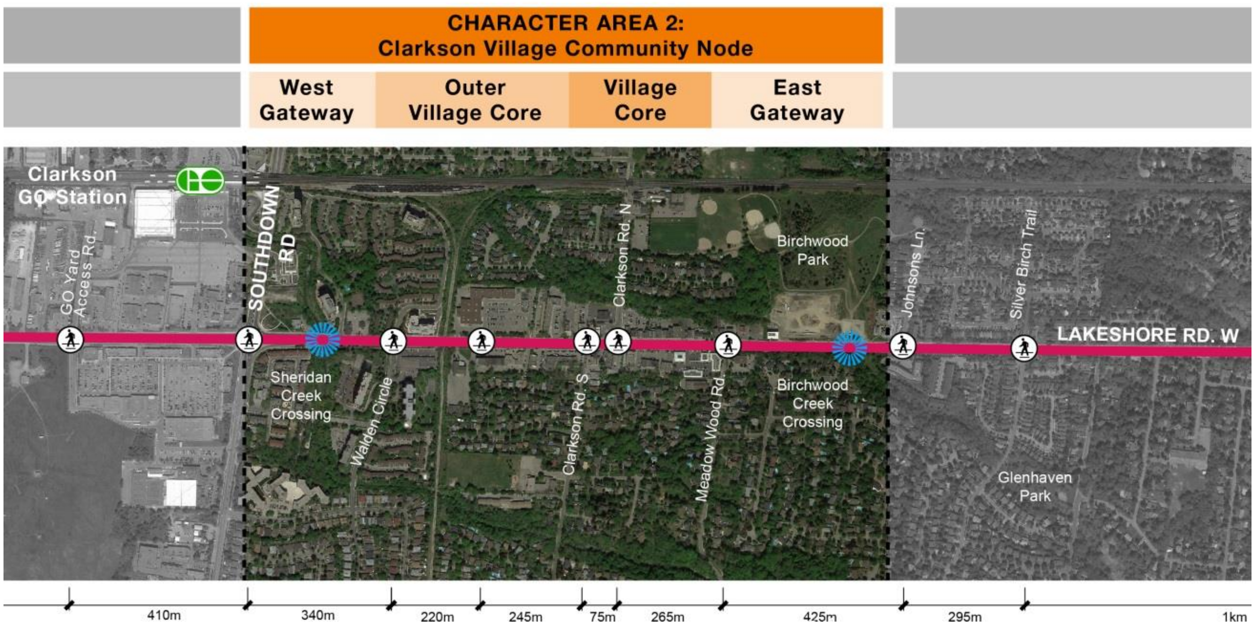
User Profile:

The road is used primarily by vehicular traffic and commercial transports moving at moderate to high speeds with very few controls and stops. The width of lanes and overall roadway allows vehicles to exceed speed limits in off-peak hours.

There is a low intensity of pedestrian and cyclist use in this area. Although there is a commercial development on the south side of the street, retail frontages face onto internal streets rather than Royal Windsor Drive. The long blocks and crossing distances, narrow sidewalks, channelized driveways and intersections, lack of any cycling facility and fast roadway speeds create an environment not suited for pedestrians and cyclists.

2.2.2 Character Area 2: Clarkson Village Community Node

Character Area 2 encompasses Clarkson Village, which is further divided into 4 Neighbourhood Character Areas, as identified in the *Clarkson Village Urban Design Guidelines, June 2004.* These include the Village Core, Outer Village Core and the East and West Gateways. This character area extends 1.6 kilometres between Southdown Road and Johnson's Lane.



WEST VILLAGE GATEWAY

The West Village Gateway segment is a largely residential area, bounded on the west by the major intersection of Lakeshore Road and Southdown Road. This area acts as an important link between Clarkson Village to the east, and the Clarkson GO station, located to the north, on Southdown Road.

<u>Land Use at Grade:</u>

The area is comprised of 1-3 storey townhouses facing onto Lakeshore Road and some mid-rise towers with large landscaped setbacks. The west boundary of the West Village Gateway is marked by a community park on the north-east corner of Lakeshore Road and Southdown Road.

General Condition on the Street:

There is very little animation of the street edge and the general character of the area is of a suburban residential neighborhood. A treed median marks the entry into Clarkson Village, just east of Southdown Road and street trees line the south side of the road. The Sheridan Creek crossing provides a very dense naturalized edge on both sides of the road, approximately mid-way through the area.

Southdown and Lakeshore Road

South Side Landscaped Boulevard

Bike facilities consist of on-street sharrows for the length of the segment. There is a narrow sidewalk adjacent to the curb along the north side of the road. The south sidewalk has a treed boulevard with furnishing zone. Where the road crosses Sheridan Creek, the north sidewalk maintains a consistent, but narrow width and the south sidewalk transitions to be adjacent to the curb, with a rolled / mountable curb and asphalt curbside zone. On the south side, the width of the sidewalk is constricted by a large indent in the roadway curb that borders a catch basin. On both sides of the road, the width of the sidewalks is constricted by concrete outer bridge barriers.

In this area, Lakeshore Road has a 5 lane cross section with a CTWLTL and concrete medians at intersections. There is no on-street parking in this area. The streets and blocks pattern along Lakeshore Road is moderate, with the distance between north-south streets averaging 170 metres. Crosswalks are located at signalized intersections at Southdown Road and Walden Circle (approx. 340 metres apart).

User Profile:

This section of Lakeshore Road accommodates primarily vehicular use, moving through at moderate to high speeds with wide lanes and few controls and stops. The width of lanes and overall roadway allows vehicles to exceed speed.

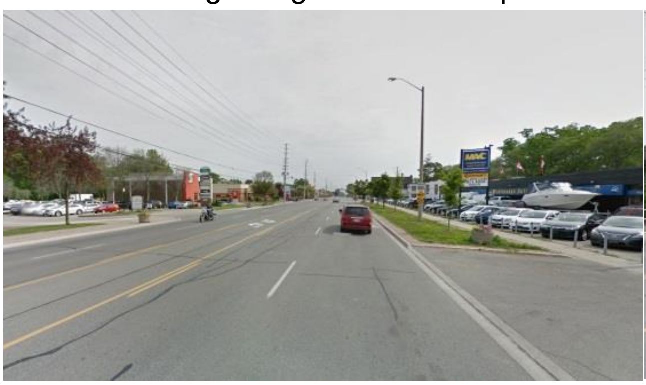
In general, speed of vehicular traffic makes this area not suitable for cyclists using the on-street sharrows as a primary cycling facility and local cyclists are likely to opt to cycle on the sidewalks. The adjacent Sheridan Creek ravine and the connection to the

Waterfront Trail running south along Southdown Road are attractive to recreational cyclists and pedestrians in the area.

The long blocks and crossing distances and the lack of an animated street edge is not conducive to local pedestrian users. However, the proximity of the Clarkson GO station and the strip commercial developments to the east and west encourages some local pedestrian commuter use.

OUTER VILLAGE CORE

The Outer Village Core is primarily an auto oriented suburban commercial strip, with front parking lots and wide driveways. The area is bisected by a railway underpass that defines the beginning of a retail strip to the east.


Retail Strip


Rail Underpass

Land Use at Grade:

The area is comprised of 1-3 storey strip commercial / mixed-use with parking lots facing Lakeshore Road. There is one mid-rise residential tower with a landscaped setback near the west edge of the segment, at Walden Circle.

General Condition on the Street:

Bike facilities consist of on-street sharrows for the length of the segment. Sidewalks are separated from the road by a landscaped and unit paved furnishing zone, including bus shelters, seating and street lighting on both sides of the street. Where Lakeshore Road crosses under the railway tracks, the sidewalk is very narrow and constrained by the bridge support piers at the back of the sidewalk, and metal guardrails at the curb.

In the Outer Village Core, Lakeshore Road has a 5 lane cross section with a continuous two-way-centre-left-turn-lane (TWCLTL) and lay-by parking on the south side of the street. The entire 460 metres segment is one continuous block, with no north-south streets intersecting Lakeshore Road. There are a number of driveways into the commercial strip malls at an average 115 metres spacing, creating smaller vehicular circulation network, but this does not improve the pedestrian realm as it creates uncontrolled vehicular crossings that dominate the east-west sidewalks. Crosswalks are located at signalized intersections at Walden Circle, at the entrance to the Clarkson Shopping Centre (approx. 220mapart) and at Clarkson Road South (approx. 245 metres apart).

User Profile:

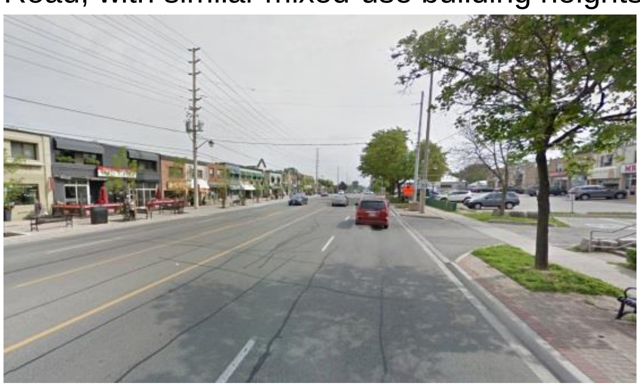
This section of Lakeshore Road accommodates primarily vehicular use, moving through at moderate speeds. The strip retail caters to vehicular traffic with front parking lots and few intersections.

In general, the speed of vehicular traffic makes this area not suitable for cyclists using the on-street sharrows as a primary cycling facility and local cyclists are likely to opt to cycle on the sidewalks. The space is particularly constrained for both cyclists and pedestrians where Lakeshore Road crosses under the rail bridge.

There is a moderate intensity of pedestrian use due to the retail character of the area. Although there is ample retail frontage on Lakeshore Road, the large setbacks, front parking lots and frequent driveways might make the pedestrian experience overwhelming for local users, who may opt to walk along the store frontages, which are set back, rather than at the street edge.

VILLAGE CORE

The Village Core is the 'main street' of Clarkson Village. It has a vibrant and animated street edge and a pedestrian-friendly streetscape. Future development in this area is intended to maintain and enhance the pedestrian scale of the north side of Lakeshore Road, with similar mixed-use building heights, and setbacks.



Clarkson Village Core

Widened Sidewalk on South Side

Land Use at Grade:

The Village Core is primarily comprised of 1-2 storey mixed-use on the north and commercial strip retail with front parking lots and wide driveways on the south.

General Condition on the Street:

Bike facilities consist of on-street sharrows for the length of the segment. There are wide sidewalks on the north and south side of the street with landscaped buffers and a unit paved furnishing zone along the curb. The south sidewalk widens into a plaza-like space with decorative unit paving at the east end of the segment, on the south west corner of Lakeshore Road and Meadow Wood Road. There are street trees in the boulevards on both sides of the street, in planters on the south side, and in below-grade trenches on the north side.

In the Village Core, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL and lay-by parking on the north and south sides of the street. The main block is 260 metres long with no intersecting north-south streets. The north side mixed-use has ample sidewalks and a well animated street edge that helps to mitigate the long block length. There are a number of driveways into the commercial strip malls on the south side at an average 60 metres spacing, that create smaller vehicular circulation network, but this does not improve the pedestrian realm as it creates uncontrolled vehicular crossings that dominate the east-west sidewalk. Crosswalks are located at signalized intersections at Clarkson Road South, Clarkson Road North (approx. 75 metres apart) and at Meadow Wood Road (approx. 265 metres apart).

User Profile:

This section of Lakeshore Road accommodates a mix of vehicular, pedestrian and cycling uses. The area is a destination for local pedestrian and vehicular traffic and provides ample on-street parking. The south side strip retail caters more to vehicular traffic with front parking lots and few intersections.

Cycling facilities could be improved as sharrows make cycling in mixed traffic intimidating to cyclists, who may opt to cycle on the sidewalks.

Despite the lack of north-south pedestrian crossings, the animated street edges, wide sidewalks, street furnishings and street tree plantings make the area more pedestrian friendly.

EAST VILLAGE GATEWAY

The East Village Gateway is defined by Birchwood Park to the north and an established residential area to the south that is elevated well above Lakeshore Road West, requiring a continuous retaining wall and landscape edge to the right-of-way.

Multi-use Path on South Side

On-Road Sharrows

Land Use at Grade:

The area is comprised primarily of recreational uses along the road, with some existing 1-2 storey commercial buildings with wide landscaped setbacks at the east and west ends of the area. The central portion of the segment is comprised of a residential development that is back-lotted onto Lakeshore Road and creating a densely planted, naturalized green edge to the road. Birchwood Park defines the north edge of the road; however, the majority of its frontage will be obstructed by a new residential development. As per the Clarkson Village Urban Design Guidelines, June 2004, the future residential community, currently under development will maintain the natural character of the area with residential buildings between 2 and 6 storeys.

General Condition on the Street:

Bike facilities consist of on-street sharrows for the length of the segment, as well as a multi-use path that begins at Meadow Wood Road. The north sidewalk ends at Meadow Wood Road where it transitions to the multi-use path adjacent to road with narrow concrete kill strip. The width of the multi-use path is constricted by slopes and a retaining wall, for the majority of this segment, but widens out at Johnson's Lane. The width of the multi-use path is also constricted by a chain link fence at the Turtle Creek crossing. Steep vegetated slopes dominate most of the length of this segment, alongside the multi-use path.

In this area, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL. A treed median marks the entry into Clarkson Village, west of Johnson's Lane. There is no on-street or lay-by parking along this portion of the road. The entire length of this segment is one single block, with no crossing north-south streets for over 425 metres. Crosswalks are located at located at Meadow Wood Road and Johnson's Lane (approx. 425 metres apart).

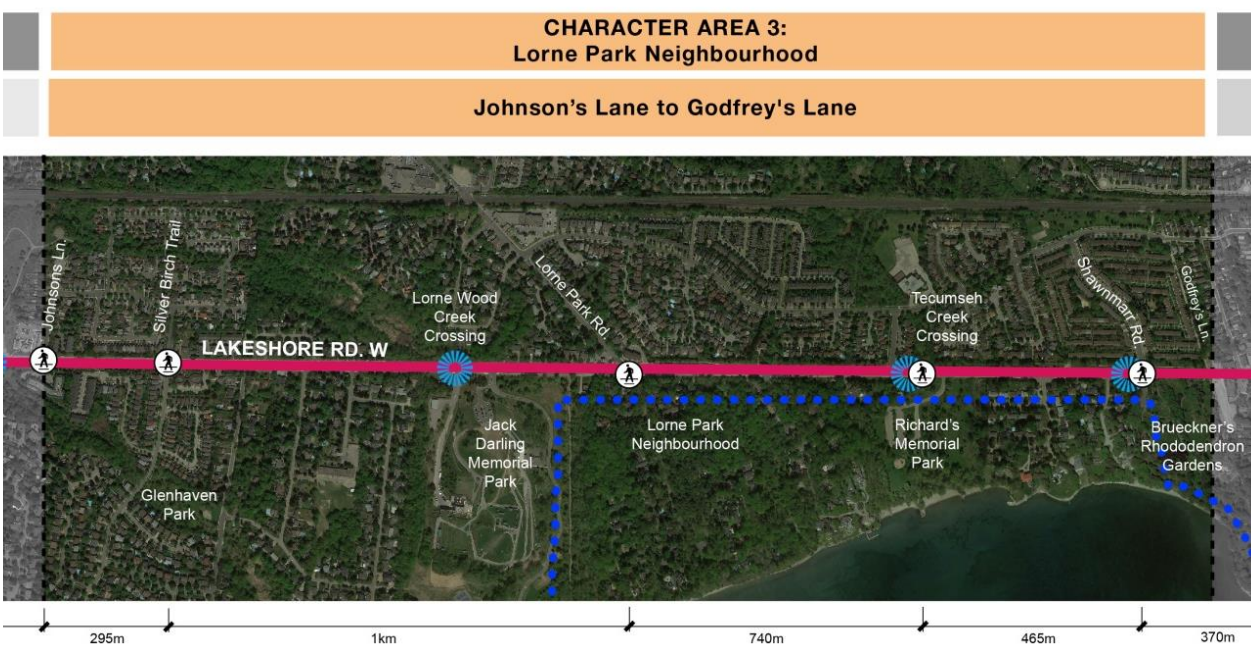
<u>User Profile:</u>

This section of Lakeshore Road accommodates primarily vehicular use, moving through at moderate to high speeds. In particular, at the east end of this segment, the area is under-developed which encourages vehicles to exceed the speed limit.

In general, speed of vehicular traffic makes this area not suitable for cyclists using the on-street sharrows as a primary cycling facility. There is a low intensity of local pedestrian use as the long uninterrupted block lengths and lack of an animated street edge are not conducive to local pedestrian use. However, there is a moderate intensity of recreational users as the green character of the right-of way and the introduction of the off-street multi-use path is desirable and inviting for recreational cyclists and pedestrians that may be moving east-west for longer distances, or heading to a destination such as Jack Darling Memorial Park, to the east.

2.2.3 Character Area 3: Lorne Park Neighbourhood

Character Area 3 extends 2.75 kilometres between Johnson's Lane and Godfrey's Lane. In this section of Lakeshore Road, very few properties face onto the road. On the south side is the Lorne Park neighbourhood, a small community that is buffered by a very dense landscaped buffer. On the north side is an older residential neighbourhood with back yard fences and a landscaped setback lining the road. Lakeshore functions as a green link between Clarkson Village to the west and the Port Credit to the east as there are very few crossing streets that connect into the adjacent neighbourhoods.



Land Use at Grade:

The area is primarily a recreational link, with the Lorne Park neighbourhood back-lotted onto Lakeshore road and screened by dense landscaped buffers. There is a small area of 1-2 storey residential facing Lakeshore Road east of Silver Birch Trail and a small area of front facing detached residential on the north side near Lorne Park Road. There are several large parks on the south side of Lakeshore Road, including Jack Darling Memorial Park, Richard's Memorial Park, Brueckner's Rhododendron Gardens, as well as several creek valleys to the north.

Landscaped Setbacks

Waterfront Trail on South Side

General Condition on the Street:

The majority of this segment is bordered by residential development with lots that back onto Lakeshore Road. There is very little animation of the street edge, dominated by fence lines covered in dense vegetation and by naturalized vegetated slopes, which give the right-of-way a very green and park-like atmosphere.

There are no on-street sharrows or bike lanes in this segment. The primary cycling facility is the multi-use path on the south side of the road, adjacent to curb. The multi-use path ends at Shawnmarr Road and there are no cycling facilities east of that point. There is a narrow sidewalk on the north side, separated from the curb by a grassy buffer of varying width. A retaining wall on the east side of Silver Birch Trail constricts the space for the north sidewalk for a short portion. Between Owenwood Drive and Jack Darling Memorial Park, where Lakeshore Road crosses Birchwood Creek, the width of the south path is constricted by a retaining wall and railing. The north sidewalk boulevard is also eliminated in this section and the vegetation from the creek is tight to the back of the sidewalk. For a short distance west of Lorne Park Drive the width of the south path is constricted by a retaining wall.

The road has a 4 lane cross-section plus dedicated turning lanes at intersections. There is no lay-by or on-street parking in this area, but there is off-street parking at Jack Darling Memorial Park. East of Shawnmarr Road, the south curb transitions to a mountable rolled curb with an asphalt parking boulevard between the road and sidewalk.

Jack Darling Memorial Park

Parking Boulevards

The scale of streets and blocks at the west and east edges of this segment is similar to Clarkson Village, with the distance between north-south streets averaging 150 metres apart. This distance is greatly increased; averaging 615 metres in the centre portion, where there are very few intersections and most properties are back-lotted onto Lakeshore Road. Crosswalks are located at signalized intersections at Johnson's Lane, at Silver Birch Trail (approx. 295 metres apart), at Lorne Park Road (approx. 1 kilometre apart), at the entrance to Richard's Memorial Park (approx. 740 metres apart) and at Shawnmarr Road (approx. 465 metres apart).

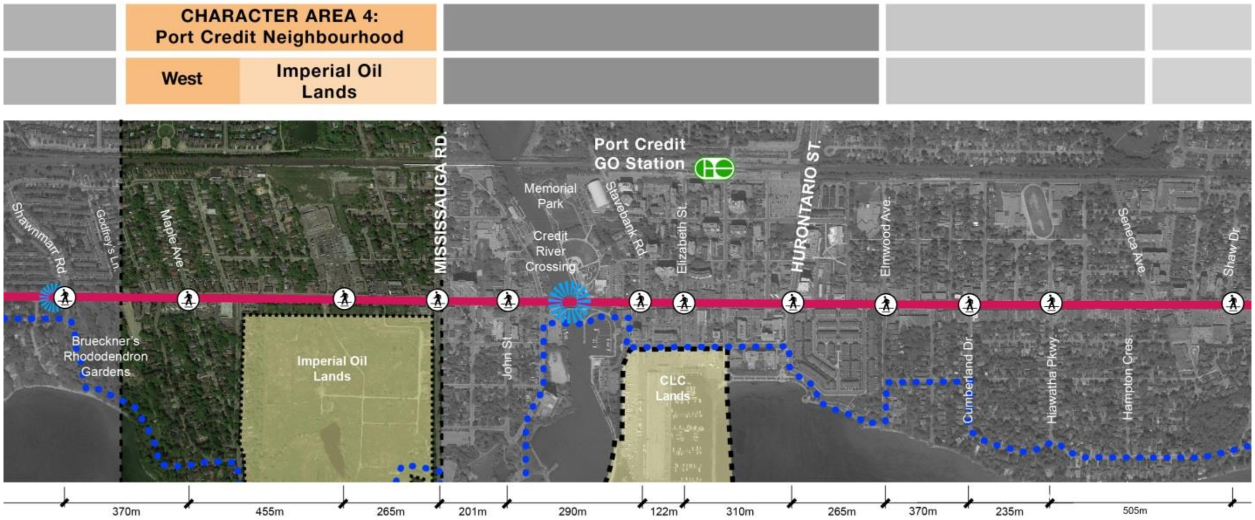
<u>User Profile:</u>

The road is used primarily by vehicular traffic moving at moderate to high speeds with very few controls and stops.

Due to the long distances between crossings and generally rear-facing adjacent uses, there is a low intensity of local pedestrian and cycling user. However, there is a moderate intensity of recreational users as the green character of the road, wide landscaped zones and multi-use path make this area desirable and inviting for recreational cyclists and pedestrians that may be moving east-west along Lakeshore Road.

2.2.4 Character Area 4: Port Credit Neighbourhood West

Character Area 4 extends over 3 kilometres and encompasses the Port Credit neighborhood, which is further divided into 4 Neighbourhood Character Areas, as identified in the Port Credit Local Area Plan, August 2015 and Inspiration Port Credit, 2013. These include the Port Credit Community Node, the Imperial Oil Lands and the East and West Port Credit Neighbourhoods.



PORT CREDIT NEIGHBOURHOOD WEST

The West Port Credit Neighbourhood is an established residential area with a regular street grid that meets Lakeshore Road at an angle. Building facades along Lakeshore Road create a saw tooth pattern of open space along the road.

West Neighbourhood

Sawtooth North Side Setbacks

<u>Land Use at Grade:</u>

This neighborhood is primarily residential and mixed-use. On the north side of the road are 1-3 storey mixed-use and commercial buildings with front parking. North side buildings are angled to Lakeshore Road with some facing the side streets. On the south side are 5-7 storey residential mid-rise buildings and some 1-3 storey commercial buildings.

<u>General Condition on the Street:</u>

There are concrete sidewalks on both sides of the road, separated from the curb by an asphalt boulevard and no on or off-street cycling facilities in this area. Sidewalks are relatively narrow with no street trees on either side of the road.

The road has a 4 lane cross-section plus dedicated turning lanes at intersections. The north and south curbs are mountable with an asphalt parking boulevard between the road and sidewalk. The distance between north-south streets averages 120 metres apart with crosswalks located at signalized intersections at Shawnmarr Road and at Maple Avenue (approx. 370 metres apart).

User Profile:

This section of Lakeshore Road accommodates a mix of vehicular and pedestrian traffic. The short blocks and adequate pedestrian space make the area relatively pedestrian friendly, however, the lack of cycling facilities forces cyclists to ride in mixed-traffic, which can be intimidating. As such, cyclists have been observed riding on sidewalks.

IMPERIAL OIL LANDS

The Imperial Oil Lands segment of the street is characterized by the large brownfield development site extending between Benson Avenue and Wesley Street and from Lakeshore Road to Lake Ontario. A framework for a future master plan for 70 Mississauga Road South, the former Texaco refiner site owned by Imperial Oil Limited was developed under the banner of Inspiration Port Credit; a City of Mississauga staff led community engagement process. The framework was approved by Council in December 2015. The site is slated for future open space, mixed-use and employment lands development and when redeveloped, the spacing of north-south connections along this segment should be greatly improved by establishing a block structure derived from the surrounding neighbourhoods.

Imperial Oil Lands on the South

Imperial Oil Lands

Land Use at Grade:

The north side of Lakeshore Road is characterized by 1-2 storey commercial properties and 1-3 storey townhouse residential buildings. There is a large shopping centre and parking lot on the north side of Lakeshore Road at the Imperial Oil Lands. The south side of Lakeshore is dominated by the Imperial Oil Lands between Benson Avenue and

Wesley Avenue, which is a large brownfield development site, fenced off and extending down to Lake Ontario.

General Condition on the Street:

There are concrete sidewalks on both sides of the road, separated from the curb by an asphalt boulevard and no on or off-street cycling facilities in this area. Sidewalks are relatively narrow with no street trees on either side of the road.

The road has a 4 lane cross-section plus dedicated turning lanes at intersections. The north and south curbs are mountable with an asphalt parking boulevard between the road and sidewalk.

There are currently no intersecting streets along the entire frontage of the Imperial Oil Lands, over 550 metres in length on the south side of Lakeshore Road. On the north side, the same span is interrupted only once by a driveway into a shopping centre, making the general scale of the streets and blocks pattern in this area very inhospitable for pedestrian activities. Crosswalks are located at signalized intersections at Maple Avenue, at the entrance to the Loblaws shopping centre (across from Imperial Oil Lands) (approx. 455mapart) and at Mississauga Road (approximately 265 metres apart).

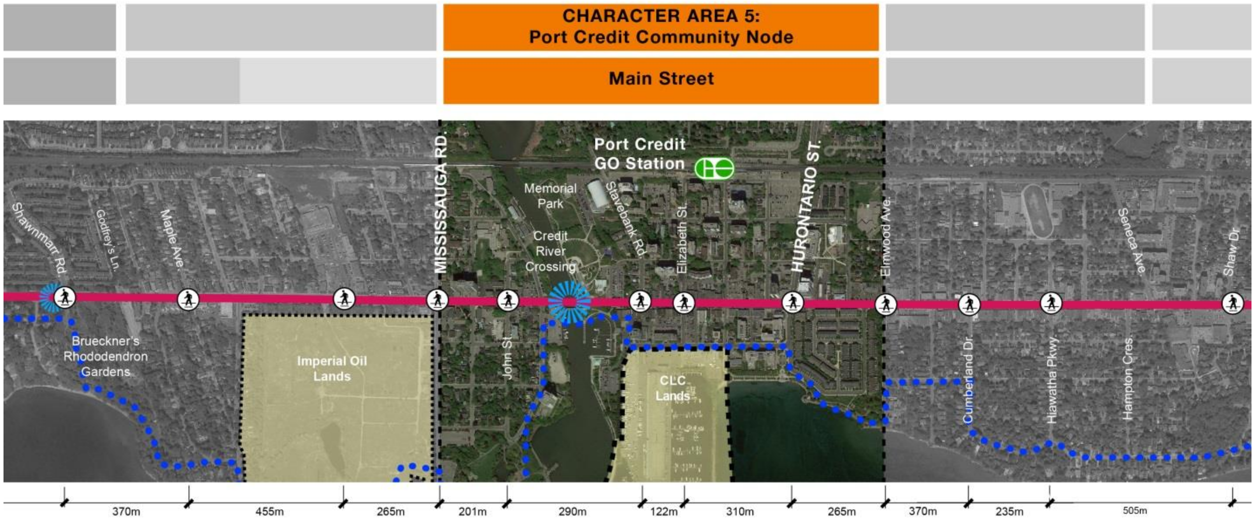
User Profile:

The road is used primarily by vehicular traffic moving at moderate to high speeds. In this area, Lakeshore accommodates a mix of vehicular and pedestrian traffic as it is a link between the west Port Credit neighbourhood and downtown Port Credit.

There is a high demand for cycling facilities into the Port Credit neighbourhood but the lack of cycling facilities forces cyclists to ride in mixed-traffic, which can be intimidating. As such, cyclists have been observed riding on sidewalks.

2.2.5 Character Area 5: Port Credit Community Node

The Port Credit Community Node is where Lakeshore Road becomes a more traditional neighbourhood main street. In this area, Lakeshore is narrowed and the street is very pedestrian oriented. The centre of Port Credit is known regionally as a scenic waterfront destination, with cafes and restaurants spilling out onto the street and spectacular views of the Credit River and Lake Ontario.



Land Use at Grade:

The area east of the Credit River is characterized by 1-3 storey mixed-use development with a very active street frontage. On the north side of Lakeshore Road, east and west of Hurontario Street are 20+ storey high-rise residential towers with ground floor retail.

To the west of the Credit River, is a mix of commercial, mixed use and residential properties. There is a 20+ storey residential tower on the north side, east of Mississauga Road with landscaped setbacks, on the south side are two churches and to the east is a mix of 3-4 storey midrise residential, some 1-3 storey strips commercial strips with front parking lots.

General Condition on the Street:

This segment is centred on the Credit River, the Port Credit Memorial Park abuts the Credit River Bridge to the north and the mouth of the Credit River flows into Lake Ontario to the south. This is the only place along Lakeshore where Lake Ontario is visible from the road.

West of the Port Credit Bridge, there are concrete sidewalks on both sides of the road, separated from the curb by an asphalt boulevard. The width of the sidewalk west of the Credit River Bridge is constrained by retaining walls and fences on both sides of the street, which does not allow space for street trees in this area. East of the bridge, sidewalks are very generous with a unit paved boulevard and furnishing zone, ornamental plantings, seat walls and street furnishings and street trees in below-grade trenches. Sidewalks on the Credit River Bridge are constrained by barriers and guardrails. There are no on or off-street cycling facilities in this segment. There are no cycling facilities on the bridge, however, a separate pedestrian and cycling bridge spans the Credit River south of main bridge.

West of the Credit River Bridge, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL. In this area, the north and south curbs are mountable with an asphalt parking boulevard between the road and sidewalk. From the Credit River Bridge eastward, Lakeshore Road narrows to a 4-lane cross-section, with additional dedicated turning lanes at Hurontario Street. There is lay-by parking on the north and south sides east of the Credit River Bridge to Elmwood Avenue.

Streets and blocks are organized in a regular grid pattern, in which north-south streets intersect Lakeshore Road at an average distance of 110 metres. This pattern extends over a small area consisting of approximately 6 city blocks with the Credit River at its heart. East of this, the block pattern is interrupted by a recent mixed-use development on the south side of Lakeshore Road, along which there is no intersection for over 200 metres, but with some mid-block pedestrian connections. Crosswalks are located at signalized intersections at Mississauga Road, at John Street (approx. 201 metres apart), at Stavebank Road (approx. 290 metres apart), at Elizabeth Street (approx. 122 metres apart), at Hurontario Street (approx. 310m apart) and at Elmwood Avenue (approx. 265 metres apart).

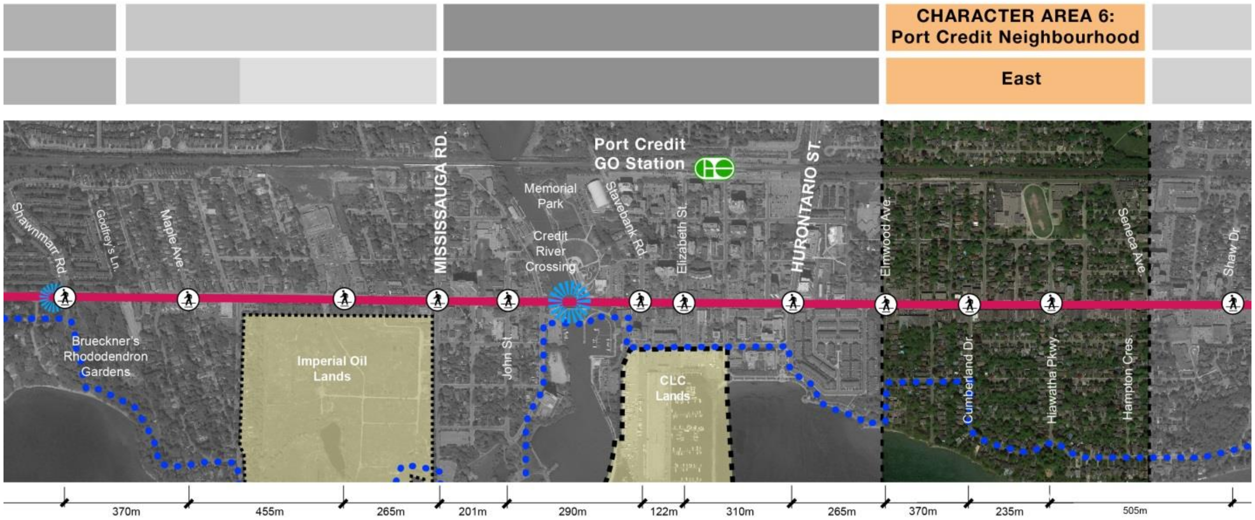
User Profile:

This section of Lakeshore Road accommodates a mix of vehicular and pedestrian traffic. The short blocks, generous sidewalks, street furnishings and highly animated street edge make this area very pedestrian friendly.

There is a high demand for cycling facilities into the Port Credit neighbourhood but the lack of cycling facilities forces cyclists to ride in mixed-traffic, which can be intimidating. As such, cyclists have been observed riding on sidewalks.

2.2.6 Character Area 6: Port Credit Neighbourhood East

The East Port Credit Neighbourhood is characterized by mixed-use development with a regular street grid. This area has a less developed street edge and is more auto-oriented than the Community Node, but maintains a high quality pedestrian realm.



Land Use at Grade:

This neighborhood is primarily comprised of 3-4 storey residential and 1-2 storey mixed-use.

General Condition on the Street:

Sidewalks on both sides of Lakeshore Road are very generous with a unit paved boulevard and furnishing zone, ornamental plantings, seat walls and street furnishings and street trees in below-grade trenches. There are no on or off-street cycling facilities in this segment.

Street Trees on South Side

Mixed-Use Developments

The road has a 4 lane cross-section plus dedicated turning lanes at intersections. There is lay-by parking on both sides of the street. The average distance between north-south street crossings is 100 metres on the north side, and 150 metres on the south side. Crosswalks are located at signalized intersections at Elmwood Avenue, at Cumberland Drive (approx. 245mapart) and at Hiawatha Pkwy (approx. 235mapart).

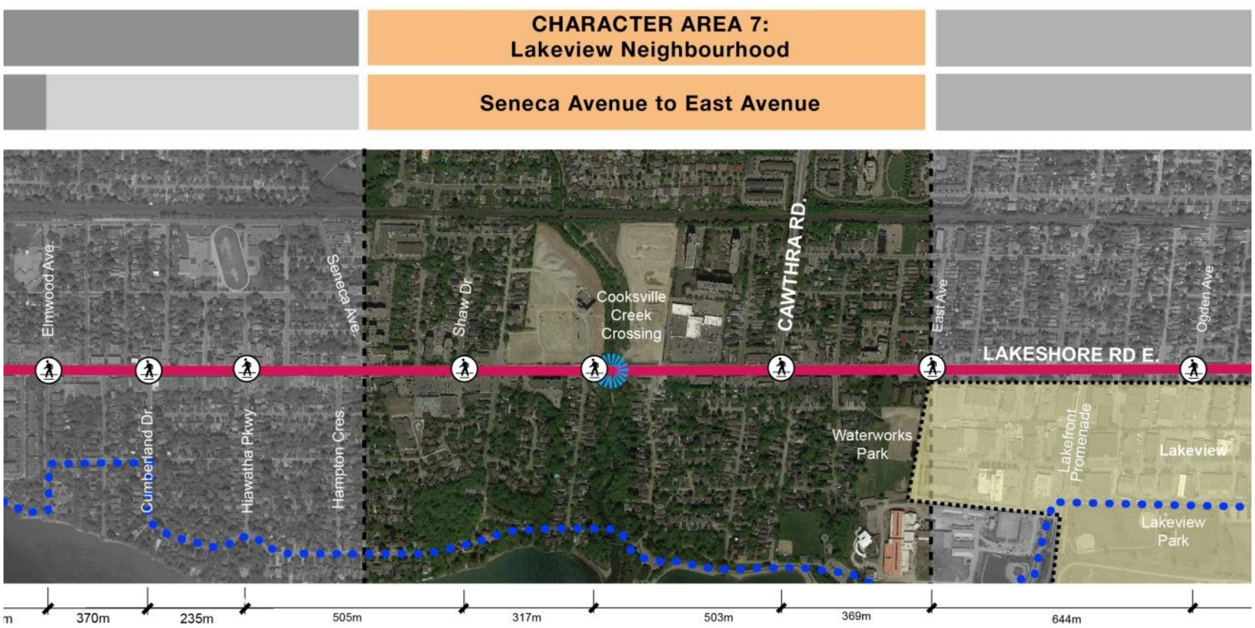
User Profile:

This section of Lakeshore Road accommodates a mix of vehicular and pedestrian traffic. The short blocks, generous sidewalks, street furnishings and highly animated street edge make this area very pedestrian friendly.

There is a high demand for cycling facilities into the Port Credit neighbourhood but the lack of cycling facilities forces cyclists to ride in mixed-traffic, which can be intimidating. As such, cyclists have been observed riding on sidewalks.

2.2.7 Character Area 7: Lakeview Neighbourhood

The Lakeview Neighbourhood spans 1.35 kilometres between Seneca Avenue and East Avenue, between the established Port Credit Neighborhood to the west and Lakeview to the east. This section of Lakeshore Road is a neighbourhood in transition, straddling the Cooksville Creek and characterized by low-rise mixed use development that is set back from the street and a number of new residential developments currently underway.



Land Use at Grade:

On the north side of Lakeshore Road, between Seneca Avenue and Shaw Drive, are 7-8 storey mid-rise residential buildings with wide landscaped setbacks. Between Shaw Drive and Enola Avenue are 1 storey commercial units with front parking. On the East and west sides of the Cooksville Creek are two large development parcels. On the west bank is a future 2-3 storey mixed-use community and on the east bank is a future 2-3 storey residential townhouse development. Taller residential buildings are proposed to the rear of the properties, away from Lakeshore Road.

The south side of Lakeshore Road is dominated by 1-2 storey strip commercial and mixed use with parking lots facing the road, as well as several 7-8 storey residential mid-rises near Hampton Crescent.

North Side Development Site **Mixed-Use and Retail**

General Condition on the Street:

There are no street trees along this portion of Lakeshore. There are two green spaces along the length of this segment; in the west end, Lakeshore crosses the Cooksville Creek and at the easternmost edge, the road is bordered by open space related to the Lakeview Water Treatment Facility.

There are no cycling facilities for the length of this segment. Cyclists must ride in the roadway in mixed-traffic. There is a narrow sidewalk adjacent to the curb which transitions to include a paved boulevard with furnishing zone on north side east of Enola Avenue. The width of sidewalks on both sides of the road is constrained at the Cooksville Creek Bridge.

In this area, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL and concrete medians at intersections. There is no on-street parking in this area and lay-by parking only on the north side between Shaw Drive and Enola Avenue. The south side curbs between Cawthra Road and West Avenue are mountable with an asphalt parking boulevard between the road and sidewalk.

The distance between north-south streets averages 100 metres west of the Cooksville Creek, and increases to an average of 150 metres east of the creek. Crosswalks are located at signalized intersections at Hiawatha Pkwy, at Shaw Drive (approx. 510 metres apart), at Cawthra (approx. 780 metres apart) and at East Avenue (approx. 360 metres apart).

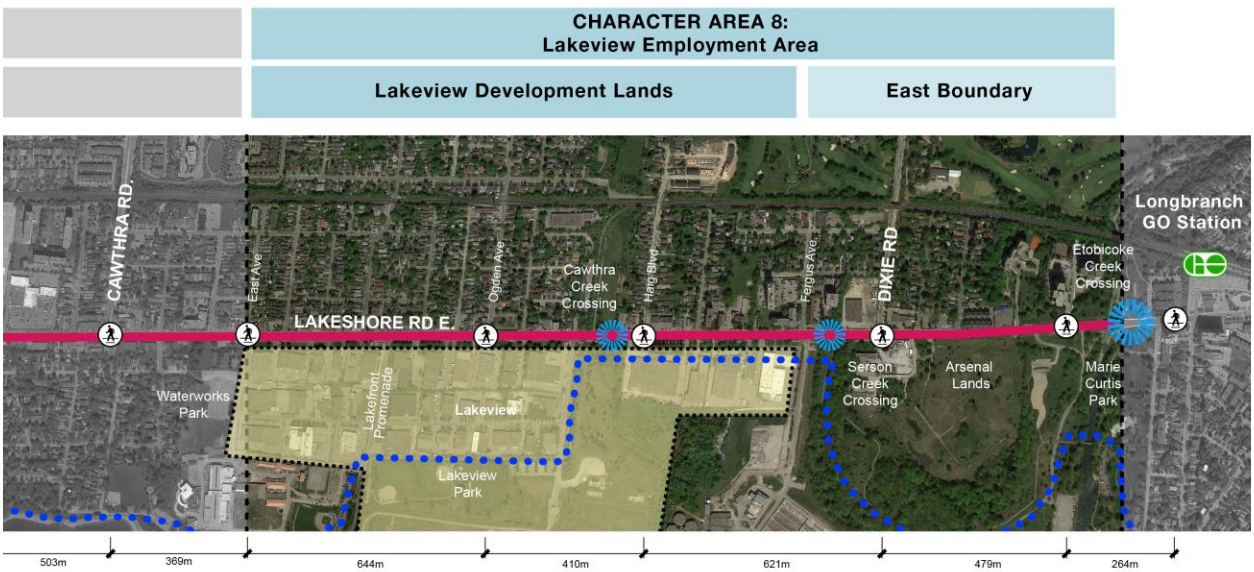
User Profile:

The road is used primarily by vehicular traffic moving at moderate to high speeds with very few controls and stops.

There is a low intensity of pedestrian and cyclist use in this area. The long blocks and crossing distances, narrow sidewalks make the area undesirable for local pedestrians and the lack of any cycling facilities creates an environment not suited for cyclists.

2.2.8 Character Area 8: Lakeview Employment Area

Character Area 8 extends over 2.3 kilometres from East Avenue to the Etobicoke Creek, at the eastern limit of the City of Mississauga. This character area is further divided into two areas including the Lakeview Development Lands in the west end of the segment and the East Boundary at the east edge of the study area.



LAKEVIEW DEVELOPMENT LANDS

The Lakeview Development Lands segment includes an existing mixed-use neighbourhood to the north and a commercial warehouse district to the south. Per *Inspiration Lakeview Master Plan, June 2014*, a planned development on the south side of Lakeshore Road will drastically improve the character of the area by introducing a fine grained network of streets and blocks that will feed into the existing road network and provide space for transit riders, cars, cyclists and pedestrians.

Land Use at Grade:

The north side is primarily comprised of 1-3 storey mixed use properties with front parking. There are some 6-7 storey mid-rise residential towers east of Orchard Road and very few detached houses throughout.

The south side is currently dominated by 1 storey commercial warehouses with large landscaped setbacks and parking lots. This area is the site of the future Inspiration

Lakeview neighborhood, which is intended to be 5-8 storey residential between East Street and the hydro corridor at Hydro Road, with mixed-use in the blocks east and west of Odgen Avenue. The area between Hydro Road and Haig Boulevard will be a future park, connecting into the Serson Creek open space.

General Condition on the Street:

There are street trees on the south side along the Waterfront Trail and the large landscaped setbacks west of Hydro road provide greening on the south side. There are intermittent street trees in the sidewalk and at the back of sidewalk on the north side, primarily at new developments and residential properties.

Mixed-Use on North Side

South Side Lakeview Development Lands

There are no on-street bike facilities however, the Waterfront Trail joins Lakeshore Road at Hydro Road and runs alongside it, going eastward. East of Hydro Road, there is no south side sidewalk and pedestrians must use the Waterfront Trail. There is a narrow unit paved kill strip along the curb. The trail is constrained by a chain link fence over the bridge crossing Serson Creek. The north sidewalk is typically a concrete sidewalk with a unit paved boulevard and furnishings zone adjacent to the curb.

In this area, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL. There is no on-street parking along this segment.

On the north side, a regular grid of streets and blocks intersects Lakeshore at an average distance of 125 metres. The scale of streets and blocks on the south side of the road is very large, with only one road bisecting the future Lakeview development, averaging a 435 metres block length. The future development of Lakeview will extend the north-south streets south of Lakeshore to create a walkable urban street grid. Currently, crosswalks are located at signalized intersections at East Avenue, at Lakefront Promenade (approx. 375 metres apart), at Ogden Avenue (approx. 270 metres apart) and at Haig Boulevard (approx. 405 metres apart).

User Profile:

The road is used primarily by vehicular traffic moving at moderate to high speeds. The strip retail on the north side of the road caters to vehicular traffic with front parking lots and few intersections.

On the north side, the block lengths are quite short and there is great opportunity to create a good pedestrian experience, however, the dominance of driveways in the strip retail and the long block lengths and lack of animation of the street edge on the south side make the area unattractive for pedestrian use.

EAST BOUNDARY

The east boundary of the study area extends 815 metres along Lakeshore Road from Fergus Avenue to the East edge of Mississauga, at the Etobicoke Creek Bridge. The Arsenal Lands and Marie Curtis Park, two large naturalized areas take up the south side of the road and help to define the character of Lakeshore Road at the East end of the City.

Land Use at Grade:

This area is characterized primarily by 1-2 storey residential, some 1 storey commercial properties with front parking and several mid-rise towers with large landscaped setbacks. There is one property under development on the north side of Lakeshore between Cherrybell Road and Deta Road, which will have 3 storey mixed use. The south side of the road is entirely recreational, with the Arsenal Lands and Marie Curtis Park taking up the entire street edge and making the south side very green.

Development Parcel on North Side

Arsenal Lands Wall

General Condition on the Street:

There are some street trees between Fergus Avenue and Delta Road, at residential properties but no street trees on the south side.

The Waterfront Trail runs adjacent to the south side of Lakeshore Road, separated by chain-link fence and grassy boulevard. The trail leaves Lakeshore just east of Dixie Road and heads south into the Arsenal Lands toward Lake Ontario. There are no on-street cycling facilities in this area, and no cycling facilities to cross the Etobicoke Creek Bridge. There are concrete sidewalks with a unit paver boulevard and furnishing zones on both sides of the road between Fergus and Dixie Road. East of Dixie Road, the north sidewalk narrows and is adjacent to the curb. There is no south sidewalk between Dixie Road and Marie Curtis Park, west of the Etobicoke Bridge but informal paths have been worn into the grass in this area. The width of right-of-way is constrained by fences and walls along the Arsenal Lands and the width of sidewalks on the Etobicoke Creek Bridge is constrained by barriers and guardrails.

No Sidewalk Along Arsenal Lands

Etobicoke Creek Bridge

In this area, Lakeshore Road has a 5 lane cross section with a continuous TWCLTL, which narrows to a 4-lane cross-section just west of the Etobicoke Creek Bridge. There is no on-street parking; however, there are bus-laybys along the north and south curbs of Lakeshore.

There is no street and block grid on the south side of the road, and a very under-developed network on the north side, with an average distance between north-south intersecting streets of 140 metres. Crosswalks are located at signalized intersections at Haig Boulevard, at Dixie Road (approx. 620 metres apart), and at the driveway to the condominium at 1515 Lakeshore Road E., which is across from Marie Curtis Park (approx. 490 metres apart). The next crosswalk to the east is located at Forty Second Street, outside the boundaries of this study, approx. 255 metres away.

User Profile:

The road is used primarily by vehicular traffic moving at moderate to high speeds with very few controls and stops.

In general, the very long blocks and crossing distances, the lack of sidewalks along the street and the lack of an animated street edge is not conducive to local pedestrian traffic. The green character on the south side of the road and its connection to the Waterfront trail make this area attractive for recreational cyclists and pedestrians, but the lack of access along Lakeshore forces these users south off the road and into the parks. Improving access on the south side of Lakeshore would vastly increase the intensity of pedestrian and cyclist use in the area.

3 Transportation Conditions

This section describes the existing transportation network supply, demand, and quality of service for each mode, including: pedestrians, cyclists, transit, and motorized vehicles. The existing overall travel demand in the Study Corridor and a safety analysis is also documented.

3.1 Right-of-Way Characteristics

3.1.1 Right-of-Way Width

The existing right-of-way (ROW) generally varies between 26 and 44.5 metres along the Study Corridor.

Exhibit 3-1 illustrates the existing ROW width along the Study Corridor. Within the Study Corridor, the ROW narrows to 26 - 31 metres at several locations and presents challenges for future improvements, the limits of these bottlenecks are as follows:

- Etobicoke Creek to Dixie Road
- Greaves Avenue to Godfrey’s Lane (majority of Port Credit area)
- Meadow Wood Road to Clarkson Road South (Clarkson Village Community Node)

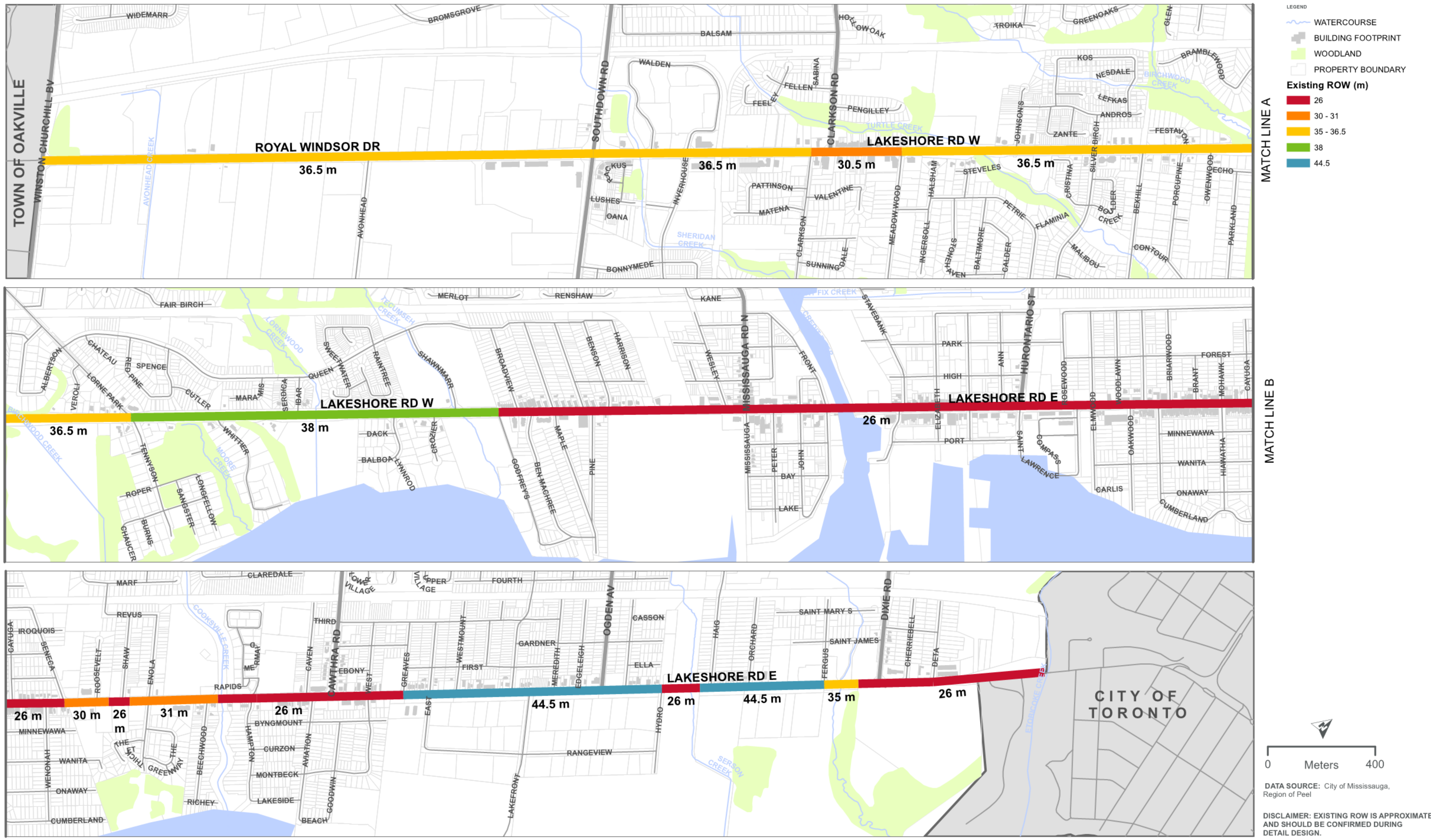


Exhibit 3-1: Existing ROW Width (metres)

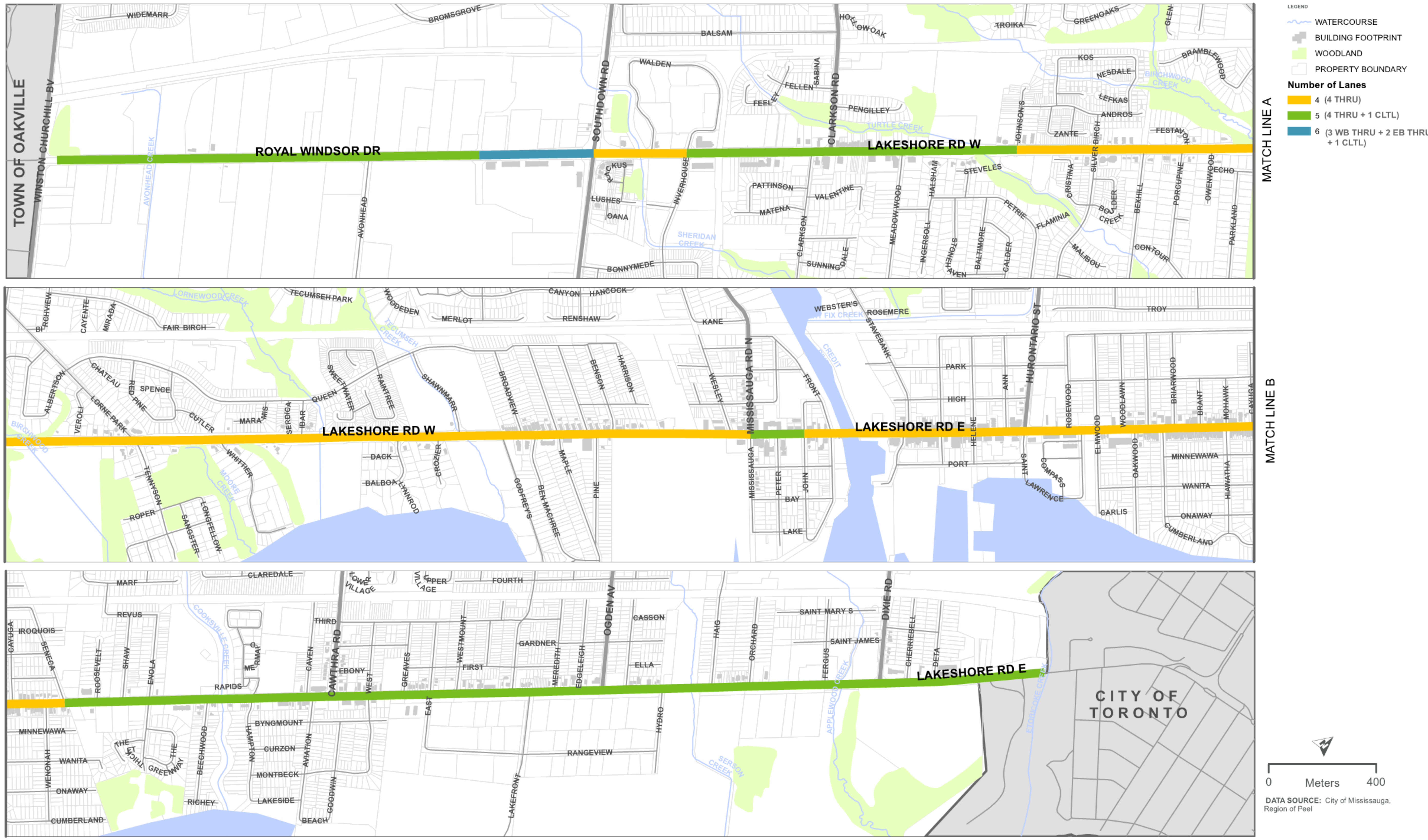


Exhibit 3-2: Existing Number of Lanes

3.1.2 Number of Lanes

Exhibit 3-2 illustrates the existing number of lanes along the Study Corridor. Throughout the Study Corridor, four general purpose through travel lanes are provided with the exception of select sections where a two-way centre-left-turn lane (TWCLTL) is provided. A TWCLTL is provided within the following sections of the corridor:

- Seneca Avenue to John Street
- Mississauga Road to Johnson's Lane
- Southdown Road to Winston Churchill

A short segment between Southdown Road and entrance to the Clarkson GO Station parking lot is six lanes with three westbound through, two eastbound through and one TWCLTL.

3.1.3 Typical Roadway Cross-Sections

Fifteen (15) detailed cross-sections for each of the eight (8) character areas illustrating the typical existing conditions for each section has been provided in **Appendix B**.

3.1.4 Traffic Controls and Speed Limits

The speed limit along Lakeshore Road is between 50 to 60 km/hour and Royal Windsor Drive has a speed limit of 60 km/hr. **Exhibit 3-3** illustrates the speed limit for each segment along the Study Corridor and the location of signalized intersections.

There are 32 signalized intersections along the Study Corridor and 49 unsignalized intersections. Three of the 32 signalized intersections are under Peel Region's jurisdiction, including: Royal Windsor Drive at Winston Churchill Boulevard, Lakeshore Road at Cawthra Road, and Lakeshore Road and Dixie Road. Signalized intersections are generally more closely spaced in "main street" areas such as Clarkson Village and Port Credit compared to areas such as Southdown and Lakeview where signalized intersections are spaced further apart. All unsignalized intersections are two-way stop controlled on the side street with Lakeshore Road as the main street. Within Port Credit and Lakeview there is a fine grain local street grid pattern with access onto Lakeshore Road approximately every 100 metres or less. Clarkson Village including Lorne Park and Southdown are characteristic of a more curvilinear local street pattern with fewer access points onto Lakeshore Road.

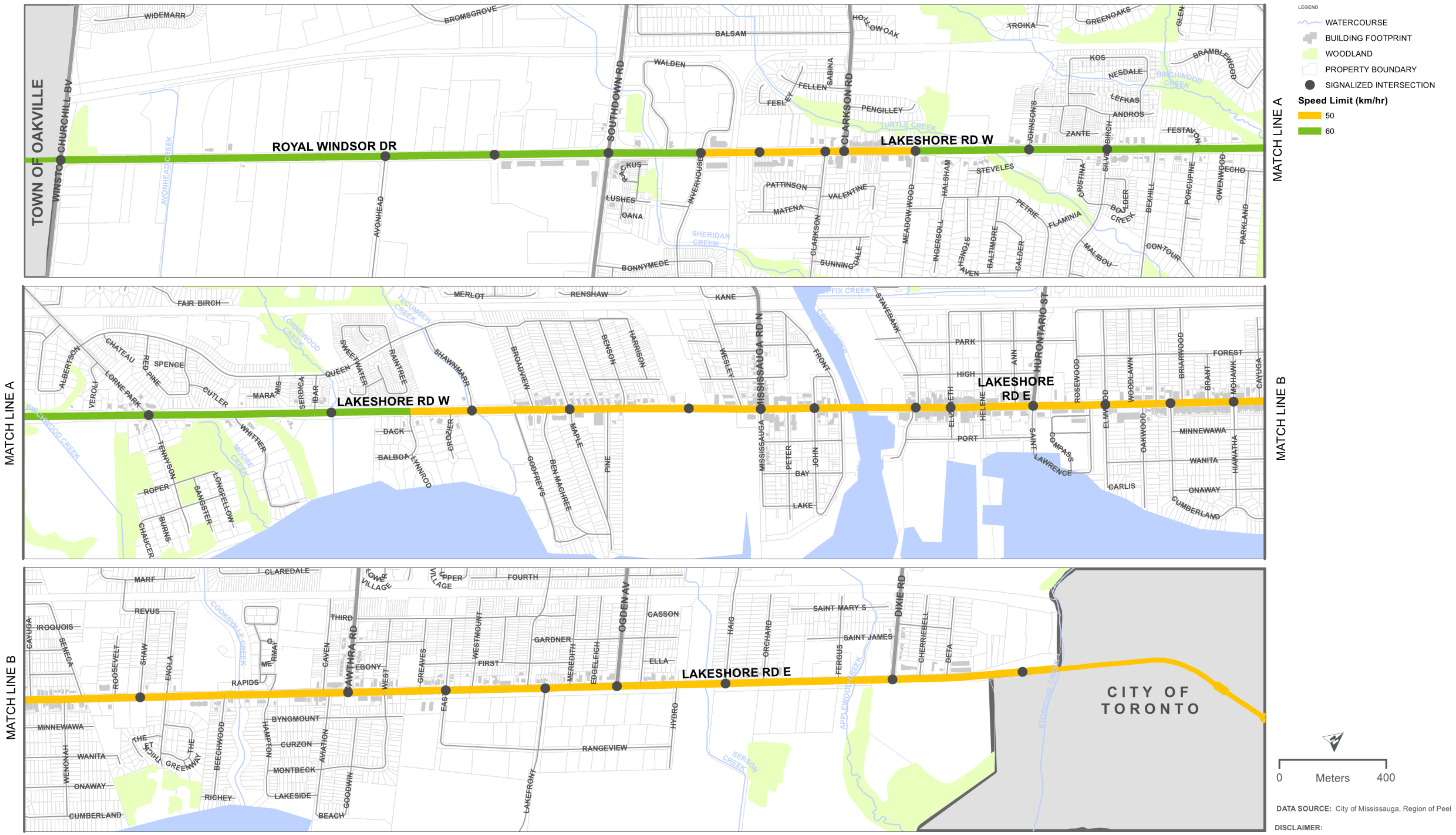


Exhibit 3-3: Existing Traffic Controls and Speed Limits

3.1.5 Driveway Access

There are several driveway accesses onto Lakeshore Road within the Study Corridor for both residential and commercial-retail properties. The location of existing driveway access points will be verified and documented at a later stage in the study to assess impacts.

3.1.6 Parking

PARKING SUPPLY

On-street parking is provided along the Study Corridor in the form of lay-bys. Lay-by parking is a designated paved area beside the main roadway where cars can park. There is no on-street parking allowed at anytime within the four general purpose travel lanes on Lakeshore Road or Royal Windsor Drive.

The majority of lay-by parking is provided on both sides of the road in the Port Credit area between Mississauga Road and Cawthra Avenue, making up 50% of the public on-street parking supply. The remaining 50% is found in Clarkson Village between Mississauga Road and Southdown Road; no on-street parking of any kind is provided in Lakeview or the Southdown Employment area. **Exhibit 3-4** illustrates the location of on-street lay-by parking along the Study Corridor. Public on-street parking represents 16% of the total parking supply along the Study Corridor.

The on-street parking supply within the corridor is subject to restrictions varying by location but is limited to the following types:

- Pay and display (10 AM to 5 PM)
- 15 or 30 minute maximum
- Standard City By-law (3 hour maximum)
- No stopping (8 AM to 9 AM or 3 PM to 4 PM, Monday to Friday, September to June)

The most common restriction and represents nearly 90% of the parking supply is the pay and display restriction.

Two other types of parking are found along the Study Corridor, including: public off-street parking and private parking which make up 23% and 60% of the parking supply, respectively.

PARKING DEMAND

A survey of parking demand was conducted for a typical weekday and weekend (Saturday) during the mid-day peak (11am to 3pm) to assess existing parking conditions along the Study Corridor. A summary of the public on-street, public off-street and private parking supply and demand for major segments of the Study Corridor is presented in **Table 3-1**, **Table 3-2**, and **Table 3-3** respectively.

Parking utilization during the mid-day peak hour for each segment of the Study Corridor for both a typical weekday and weekend (Saturday) is shown in **Table 3-4.** For all segments of the Study Corridor and for all parking types, parking spaces are utilized more during weekdays than on weekends. Public on-street parking is most utilized in the Port Credit area (i.e. Hurontario Street to Mississauga Road), whereas public off-street parking most utilized in the Southdown Employment area but also highly utilized in the Port Credit and Lorne Park communities.

Table 3-1: Public On-street Parking Summary

Corridor			North Side (WB)			South Side (EB)		
Main Street	From	To	Supply	Weekday	Saturday	Supply	Weekday	Saturday
Lakeshore Rd	43rd St	Cawthra Rd	0	0	0	0	0	0
	Cawthra Rd	Hurontario St	74	25	23	17	5	4
	Hurontario St	Mississauga Rd	83	63	61	168	125	92
	Mississauga Rd	Lorne Park Rd	74	45	48	84	64	57
	Lorne Park Rd	Southdown Rd	39	28	27	144	97	74
Royal Windsor Dr	Southdown Rd	Winston Churchill Blvd	0	0	0	0	0	0
Total			270	161	159	413	291	227

Table 3-2: Public Off-street Parking Summary

Corridor			North Side (WB)			South Side (EB)		
Main Street	From	To	Supply	Weekday	Saturday	Supply	Weekday	Saturday
Lakeshore Rd	43rd St	Cawthra Rd	37	14	11	0	0	0
	Cawthra Rd	Hurontario St	89	54	42	73	36	26
	Hurontario St	Mississauga Rd	35	18	14	165	125	89
	Mississauga Rd	Lorne Park Rd	98	63	48	132	103	74
	Lorne Park Rd	Southdown Rd	282	223	170	49	33	24
Royal Windsor Dr	Southdown Rd	Winston Churchill Blvd	0	0	0	22	18	13
Total			541	372	285	441	315	226

Table 3-3: Private Parking Summary

Corridor			North Side (WB)			South Side (EB)		
Main Street	From	To	Supply	Weekday	Saturday	Supply	Weekday	Saturday
Lakeshore Rd	43rd St	Cawthra Rd	237	90	68	420	277	210
	Cawthra Rd	Hurontario St	200	114	86	195	140	106
	Hurontario St	Mississauga Rd	110	84	64	69	59	45
	Mississauga Rd	Lorne Park Rd	129	92	70	109	74	56
	Lorne Park Rd	Southdown Rd	405	210	159	213	120	91
Royal Windsor Dr	Southdown Rd	Winston Churchill Blvd	296	266	201	164	116	88
Total			1377	856	648	1170	786	596

Table 3-4: Parking Utilization (Overall Study Corridor)

Corridor			Public On-street		Public Off-street		Private	
Main Street	From	To	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Lakeshore Rd	43rd St	Cawthra Rd	-	-	38%	30%	56%	42%
	Cawthra Rd	Hurontario St	33%	30%	56%	42%	64%	49%
	Hurontario St	Mississauga Rd	75%	61%	72%	52%	80%	61%
	Mississauga Rd	Lorne Park Rd	69%	66%	72%	53%	70%	53%
	Lorne Park Rd	Southdown Rd	68%	55%	77%	59%	53%	40%
Royal Windsor Dr	Southdown Rd	Winston Churchill Blvd	-	-	82%	59%	83%	63%
Total			66%	57%	70%	52%	64%	49%

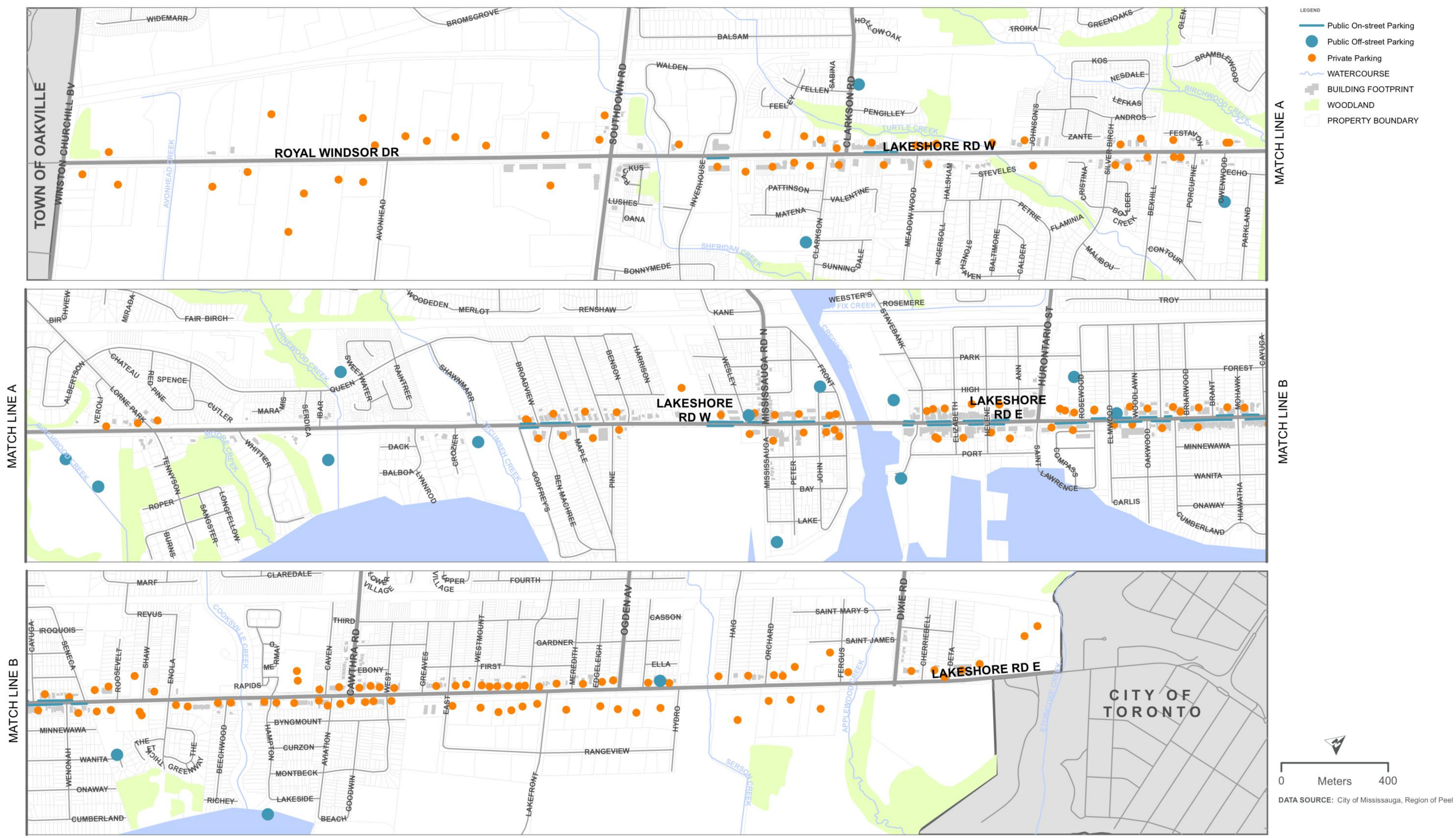


Exhibit 3-4: Parking Supply

3.2 Travel Demand

3.2.1 Strategic Analysis Area

Using the 2011 Transportation Tomorrow Survey (TTS), overall mode shares, origin-destination (OD) patterns, and average trip length distributions were calculated to gain an understanding of existing travel within the Strategic Analysis Area (bounded by the QEW, east City limit, Lake Ontario, and west City limit).

MODE SHARE

A total of approximately 150,000 trips originated from the Strategic Analysis Area during a typical day. Of the 150,000 trips, 85% were made by car, 10% by transit, and 5% by active modes such as walking or cycling, as illustrated in **Exhibit 3-5**. There is a high propensity to travel by car which is indicative of a primarily auto-oriented, low-density area in close proximity to a major freeway with free parking at regional rail stations.

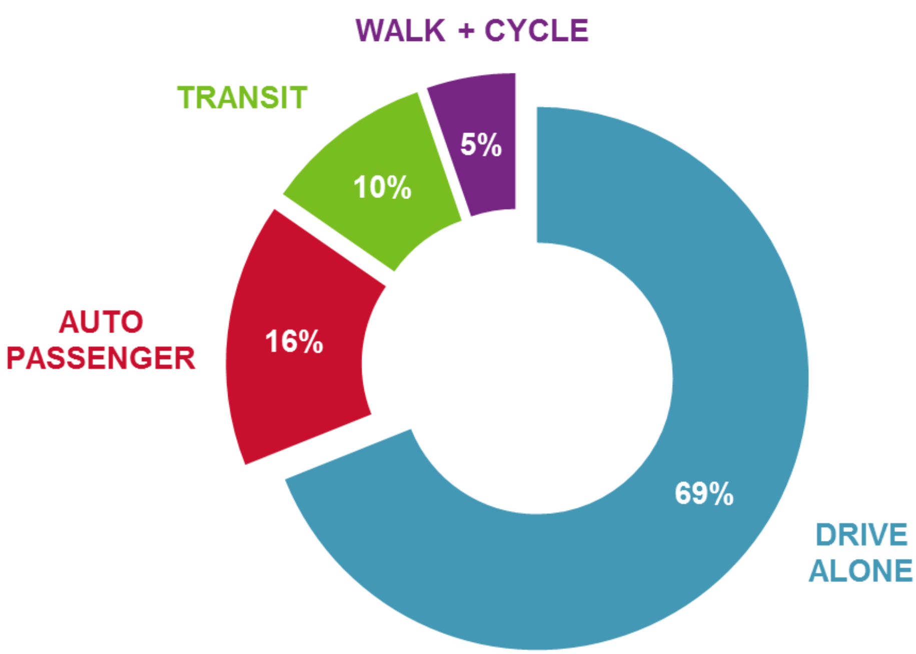


Exhibit 3-5: Strategic Analysis Area Trip Origin Mode Shares (2011 Daily Trips) (Source: TTS)

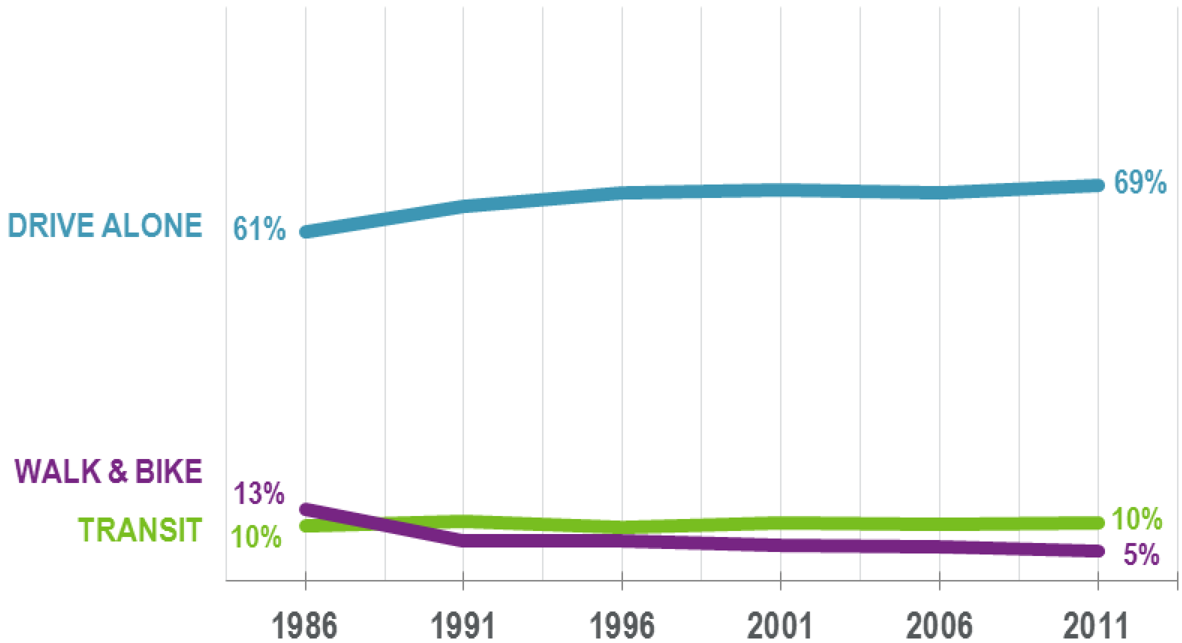


Exhibit 3-6: Strategic Analysis Area Trip Origin Mode Shares (1986-2011 Daily Trips) (Source: TTS)

A review of historical data as shown in **Exhibit 3-6** revealed that auto dependence has been on the rise within the Strategic Analysis Area over a 25 year period while transit use has remained constant and the use of active modes of transportation such as walking and cycling has decreased. During the same 25 year time period (1986 – 2011) the overall number of trips made in the Corridor has increased by 12%; however, since 2006 the total number of trips has decreased by 2%.

ORIGIN – DESTINATION (OD) PATTERNS

A total of 243,818 trips originated from or were destined to the Strategic Analysis Area during a typical day. Of the 243,818 trips, 23% were internal to the corridor, 38% were to the rest of the City of Mississauga, 7% were to Oakville, 20% were to the City of Toronto, and the remaining 12% were to other parts of the Greater Toronto and Hamilton Area (GTAH) as illustrated in **Exhibit 3-7**.

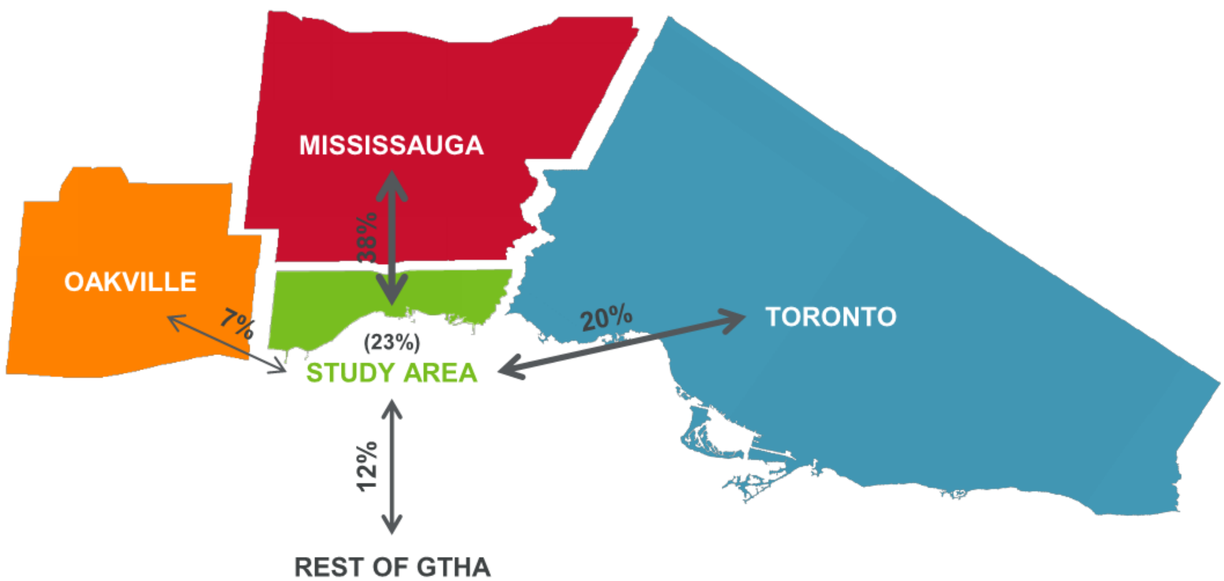


Exhibit 3-7: Strategic Analysis Area Origin-Destination Pattern (Source: TTS)

During the AM peak period (i.e. 6 – 9 AM), a similar pattern is observed with 22% of trips internal to the corridor, 39% to the rest of the City of Mississauga, 7% to Oakville, 21% to the City of Toronto, and 12% to other parts of the GTHA. However, when considering the transit mode alone which represents 15% of all trips taken during the AM peak period, only 9% of transit trips were internal to the corridor, 43% to the rest of Mississauga, 1% to Oakville, 43% to the City of Toronto, and 5% to other parts of the GTHA. Existing travel patterns indicate that it is equally important for trip makers within the Strategic Analysis Area to access the rest of Mississauga as it is the City of Toronto by transit.

DAILY TRIP LENGTH

The average daily trip length for all trips with an origin or destination within the Strategic Analysis Area is approximately 15.6 kilometres regardless of the mode taken. **Exhibit 3-8** presents the average trip length for all trip types for an entire day with an origin or destination within the Strategic Analysis Area by mode. Trips made using both the GO rail and local transit mode are approximately 35 kilometres on average and are the longest trips observed, where as walking trips are 1.2 kilometres on average and are the shortest trips observed as expected. Those taking GO rail only have an average trip distance of 32 kilometres which is consistent with a typical GO train ride from southern Mississauga to Downtown Toronto/Union Station.

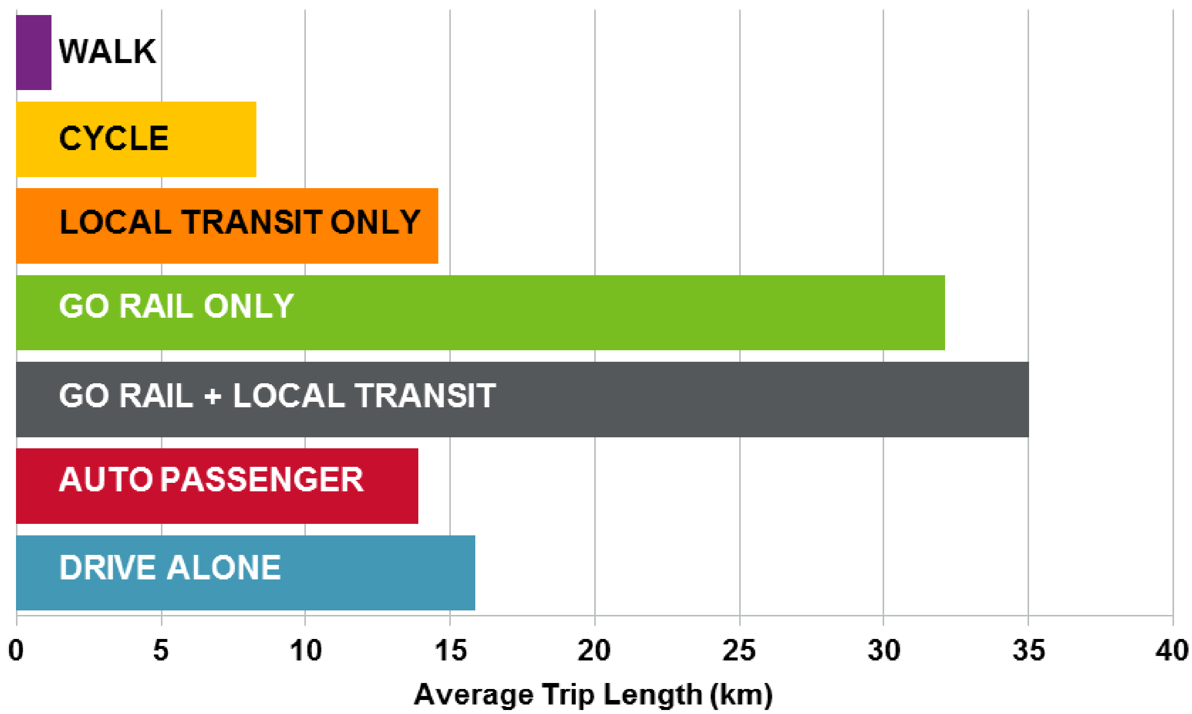


Exhibit 3-8: Average Daily Trip Length by Mode (Source: TTS)

There are approximately 12,650 trips made within the Strategic Analysis Area which are less than or equal to 1 kilometre. Of these trips, 70% were made by car, 1% by transit, and 30% by active modes such as walking or cycling, as illustrated in **Exhibit 3-9**. The high proportion made by those driving alone implies that walking and cycling are not attractive alternative modes to driving for short trips (i.e. ≤ 1 km). Infrequent busses with a single cash fare compared to pay by distance or timed transfers may also inhibit short trips by transit.

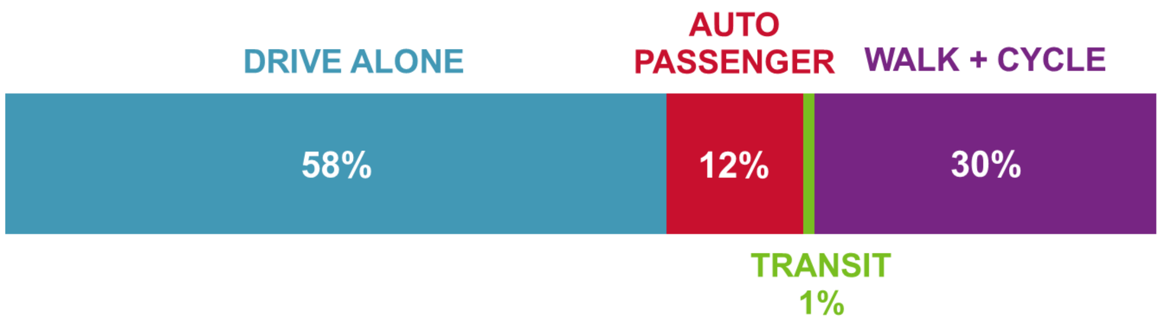


Exhibit 3-9: Trips Less Than or Equal to 1 km by Mode (Source: TTS)

3.2.2 Character Analysis Areas

Although the analysis of travel demand and patterns within the Strategic Analysis Area as a whole are important, the individual character areas along the Study Corridor, specifically: Clarkson Village, Port Credit, and Lakeview may have different travel demands and patterns compared to the rest of the Corridor and have been examined separately.

Again using the 2011 Transportation Tomorrow Survey (TTS), an analysis of mode share by time of day, trip purpose by time of day and the trip purpose by mode for each character area was performed. The results are presented in the following sections.

To better understand the time variation of trips over a given day, the analysis was performed for trips starting from and ending in the character area during four time periods: AM peak (6 – 9 a.m.), mid-day (9 a.m. – 3 p.m.), PM peak (3 – 7 p.m.), and evening (7 p.m. – 6 a.m.)

MODE SHARE BY TIME OF DAY

Overall daily mode share is similar across the three character areas as shown in **Exhibit 3-10** and is consistent with the mode share observed for the Strategic Analysis Area as a whole. Mode shares represent trips originating from and destined to each character area. This pattern indicates that the auto driver mode is dominant amongst all character areas and the transit mode share is relatively constant despite the fact that Clarkson Village and Port Credit are better served by rapid transit (i.e. close proximity to GO Train Station) where Lakeview is not.

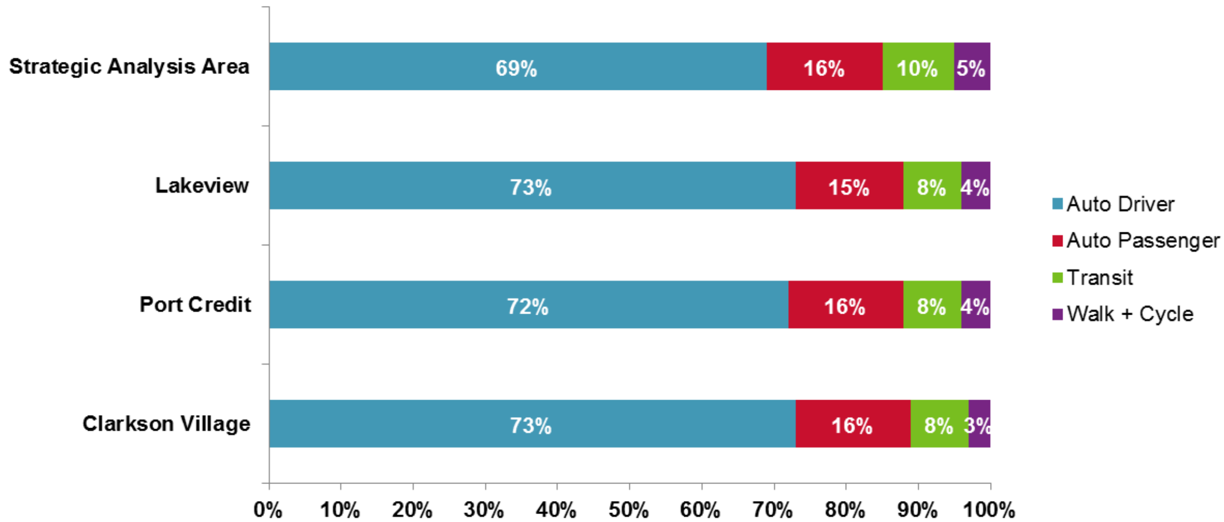


Exhibit 3-10: Daily Mode Share Comparison

Among the three character areas Port Credit has the highest number of trips with approximately 24,000 daily, where as Lakeview has approximately 15,500 and 10,000 within Clarkson Village.

Mode share varies marginally depending on the time of the day as illustrated by

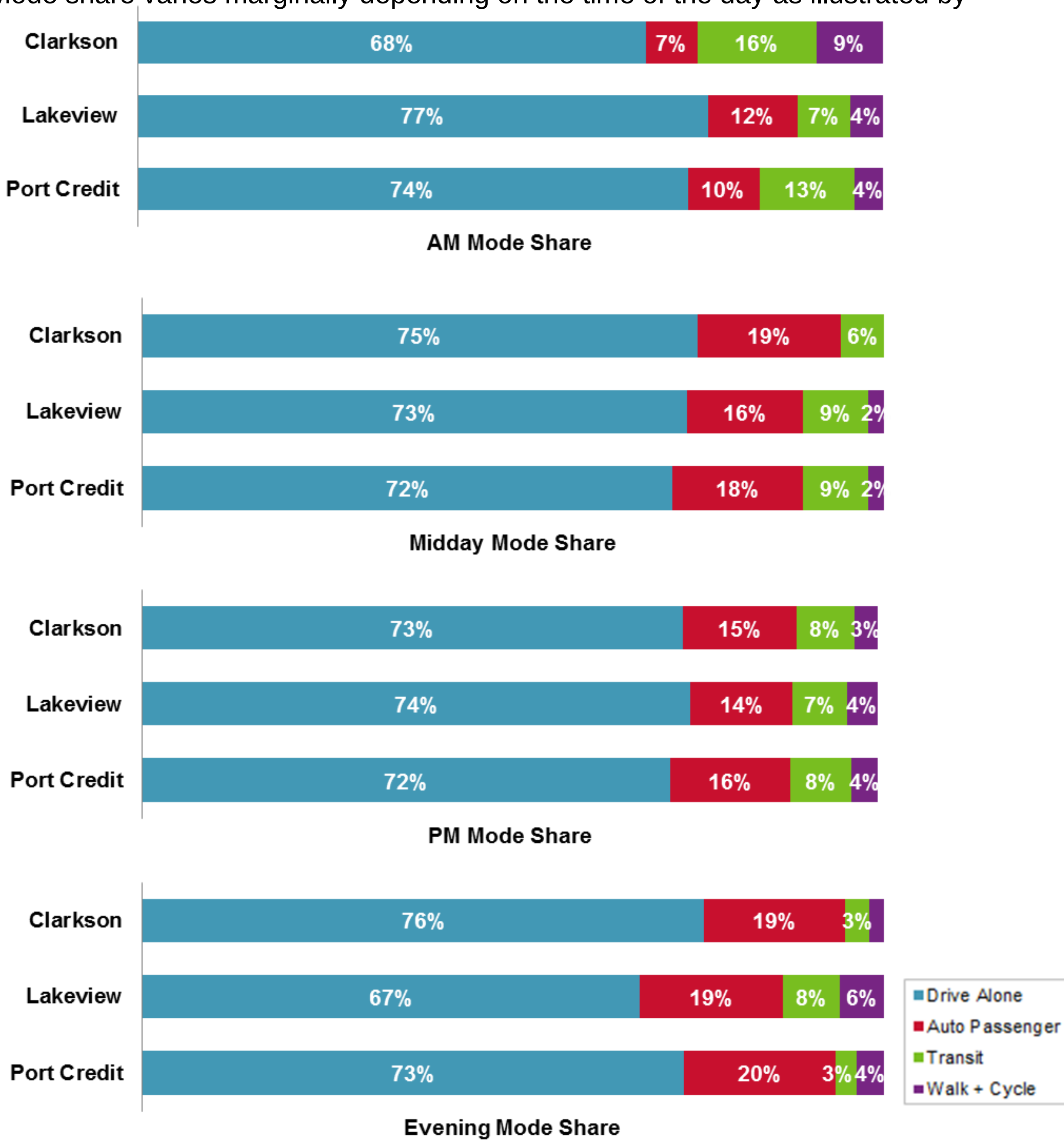


Exhibit 3-11. Drive alone maintains the highest share throughout the day with 70% mode share or higher. Only in the Lakeview character area does the drive alone share drop under 70% during the evening period. The auto passenger mode is approximately 20% during the off-peak periods (midday and evening) when the majority of facilitating trips take place (grocery shopping, children activities etc.).

In the Clarkson and Port Credit character areas, transit share is substantially higher during the AM peak with 16% and 13% respectively. Transit share in the Lakeview character area is consistently around 8% during the day with some additional trips during the midday and evenings. If considering only trips originating from the character areas, the transit mode share is even higher with 25% of trips being made from the Port Credit area by transit in the AM peak period. This difference in transit share may be attributed to GO trips that originate from the Clarkson and Port Credit character areas during the AM peak period. For trips destined to the Clarkson and Port Credit area in the PM peak period the transit share drops marginally indicating that the reverse commute is not as uniform as the morning commute and spreads in the midday and evening.

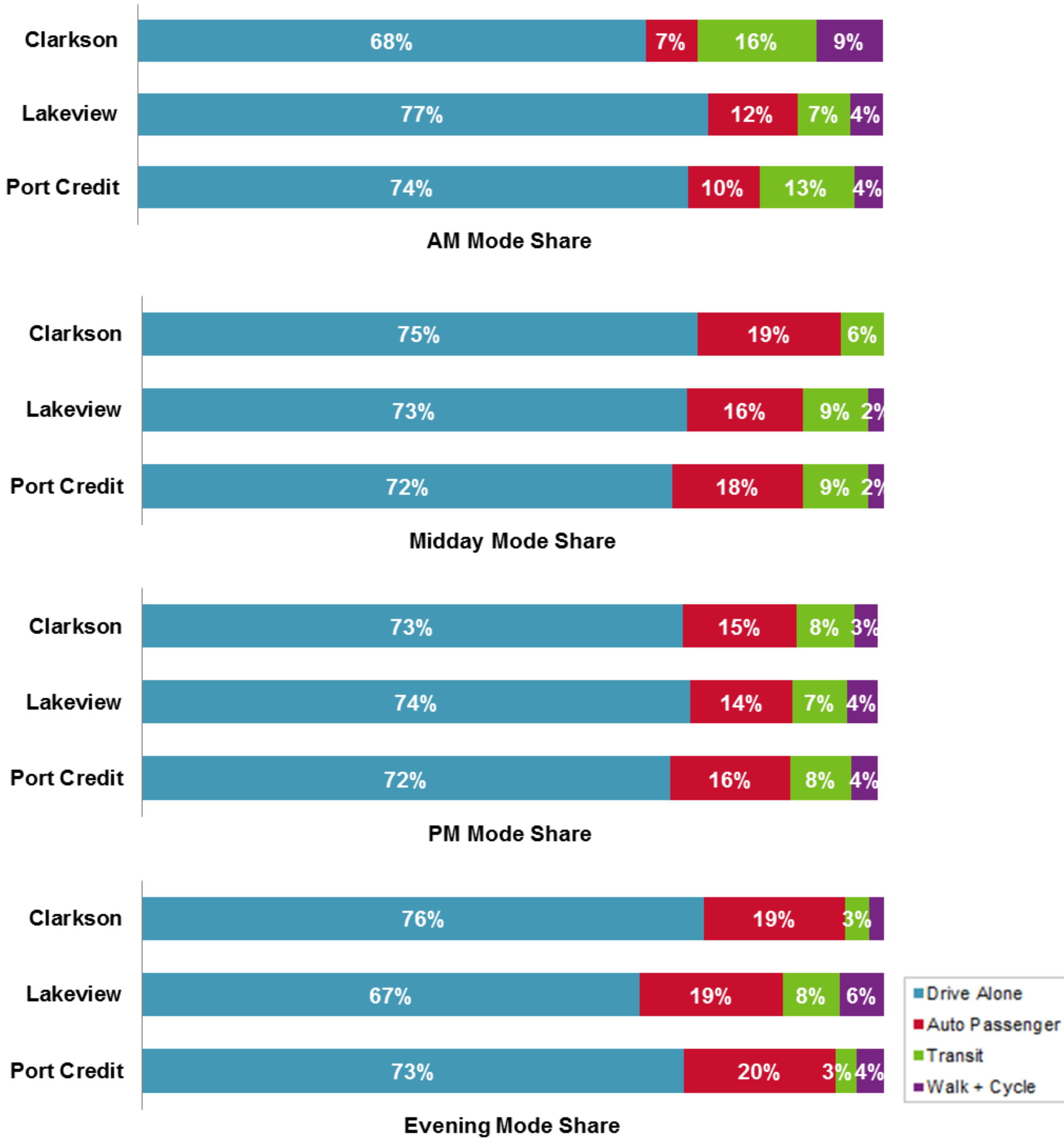


Exhibit 3-11: Mode Share by Time Period in each Character Area

TRIP PURPOSE BY TIME OF DAY

The share of daily trips by purpose is presented below based on the categorization provided by TTS which distinguishes trips as home-based-work trips, home-based-school trips, home-based-discretionary, and non-home-based trips. A home based trip is one that either starts or ends at home. However, for the majority of trips it is typically easy to determine which end of the trip is home (for example in the AM peak a home-based-work trip originates at home and is destined to work). Discretionary trips cover a wide range of trip purposes that are not work or school, including shopping, recreational activities, facilitating a passenger etc. The share of trips by purpose and time of day for each character area is shown in **Exhibit 3-12**.

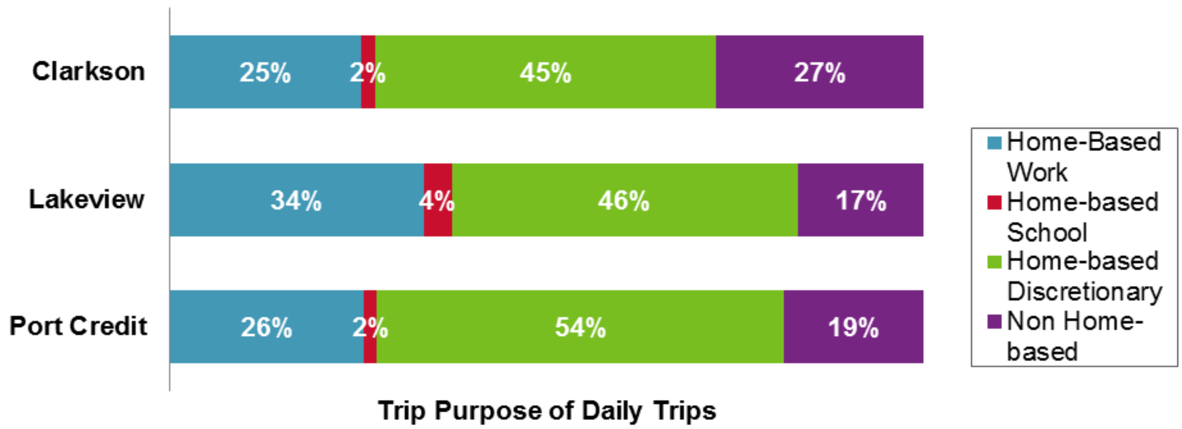


Exhibit 3-12: Trip Purpose Share of Daily Trips for Character Areas

Trips that originate in all three character areas in the AM are primarily home-based-work trips. The share of home-based-work trips is higher in the Port Credit area (58%) and in the Clarkson area (63%) compared to the Lakeview area (41%). For trips destined to the character areas, Lakeview has a higher share of home-based-work trips (74%) compared to Port Credit (52%) and Clarkson (45%). This finding indicates that Lakeview is a larger employment area and attracts more work trips in the AM.

During the AM period, Port Credit and Clarkson have a high rate of home-based discretionary trips that are destined in the area (31%) compared to Lakeview (14%). This pattern may be attributed to drivers dropping off a passenger at the Port Credit GO Station (last station in Mississauga) and continuing on to their destinations.

The Lakeview character area has a high rate of home-based-work trips destined there in the evening (26%), compared to 12% in Port Credit and 9% in Clarkson. The high share of work trips during the non-traditional peak periods may be attributed to the presence of "shift-work" employment.

Exhibit 3-13 presents the purpose of trips that start and end in each character area during the day.

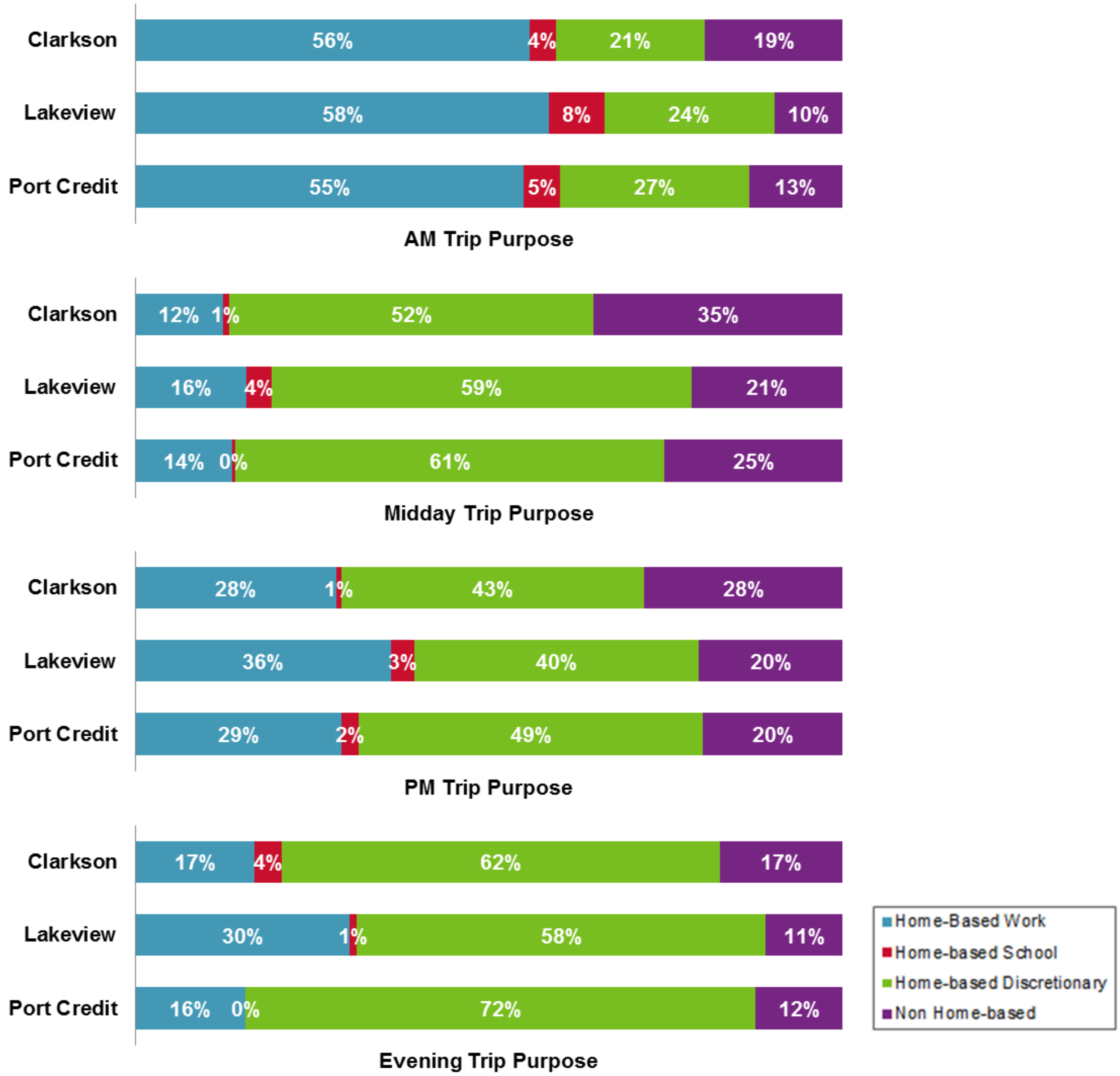


Exhibit 3-13: Trip Purpose Share by Time of Day in each Character Area (trips that originate and that are destined in each character area)

TRIP PURPOSE BY MODE

Most trips in the three character areas, regardless of trip purpose, are made in single occupancy vehicles and make up 73% of all daily trips.

The share of transit for home-based-work trips that originate and are destined in Clarkson and Port Credit is, as expected, higher than in Lakeview due to the presence of GO Stations (approximately 18% compared to 9%).

Most student trips that originate in Port Credit (50%) walk to school or take local transit or GO (38%), while school trips that start in the Lakeview area primarily use local transit or school buses (40%) and walk to school (30%). In contrast, school trips that start in the Clarkson are either made by car or GO. However, the home-based-school trip sample in the Clarkson area is relatively small and therefore statistics regarding those shares should be interpreted with caution.

In all three character areas the majority of home-based-discretionary trips are either made as a driver in a private vehicle (approximately 71-74%), or as passenger (21%). Although most of the discretionary trips (grocery shopping, going to the gym) are typically destined in close proximity to home it is evident that transit and active modes are not preferred.

Finally, the non-home-based trips showcase very similar patterns to the discretionary trips with over 80% made as a driver.

Exhibit 3-14 shows the mode choice by trip purpose for trips that both start and end in each character area. School bus trips have been grouped under the "transit" mode category for this analysis.

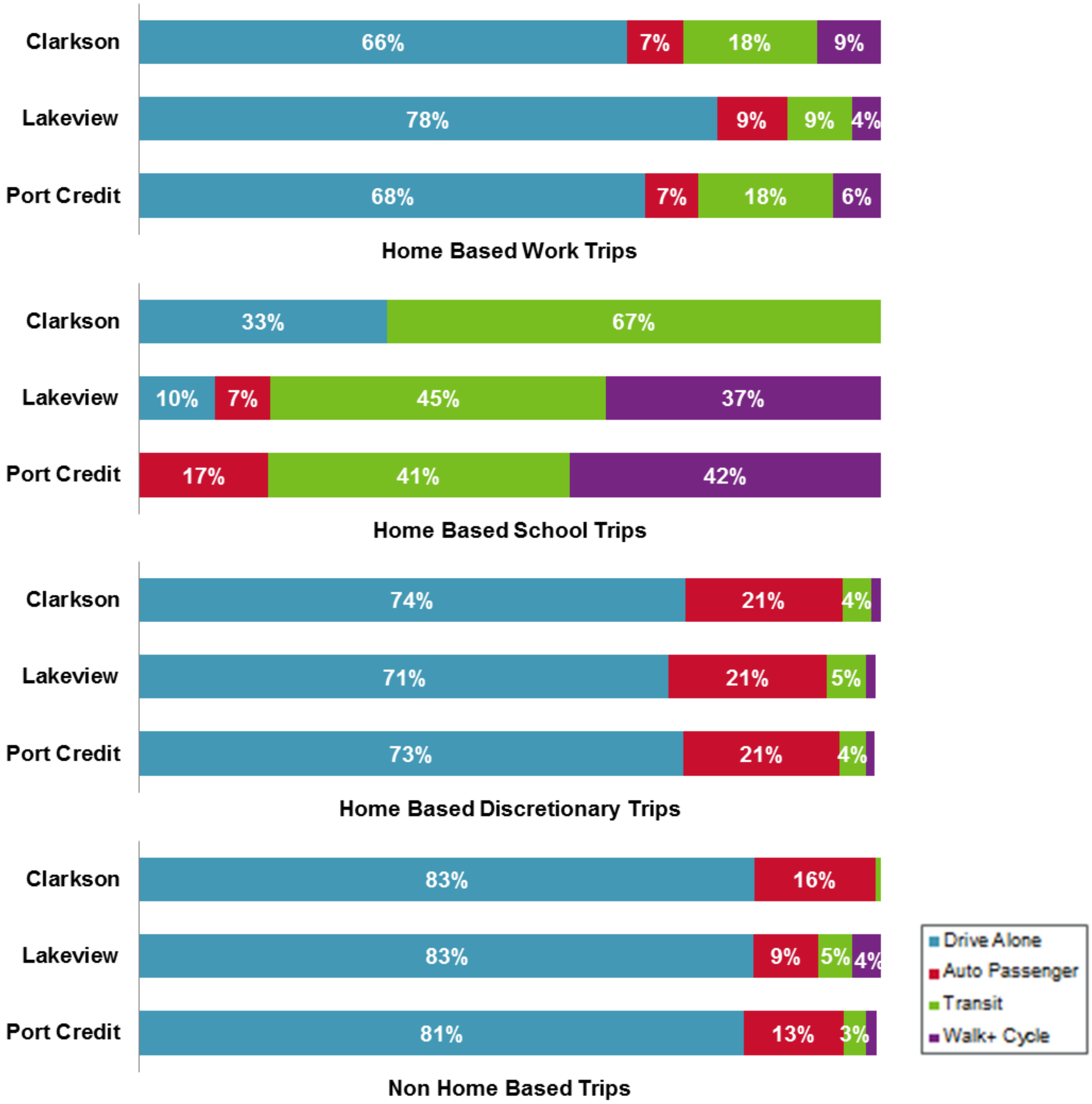


Exhibit 3-14: Mode Choice by Trip Purpose in each Character Area

3.3 Pedestrians

The following section describes the existing network, demand and quality of service with respect to pedestrians within the Study Corridor and Network Analysis Area.

3.3.1 Pedestrian Network

The sidewalk and trail network within the Network Analysis Area is illustrated in **Exhibit 3-15**. A sidewalk or trail is generally provided on both sides of the roadway for the entire Corridor with the exception of the south boulevard on Royal Windsor Drive between Winston Churchill Drive and Avonhead Road and the south boulevard on Lakeshore Road between Dixie Road and the east City limit.

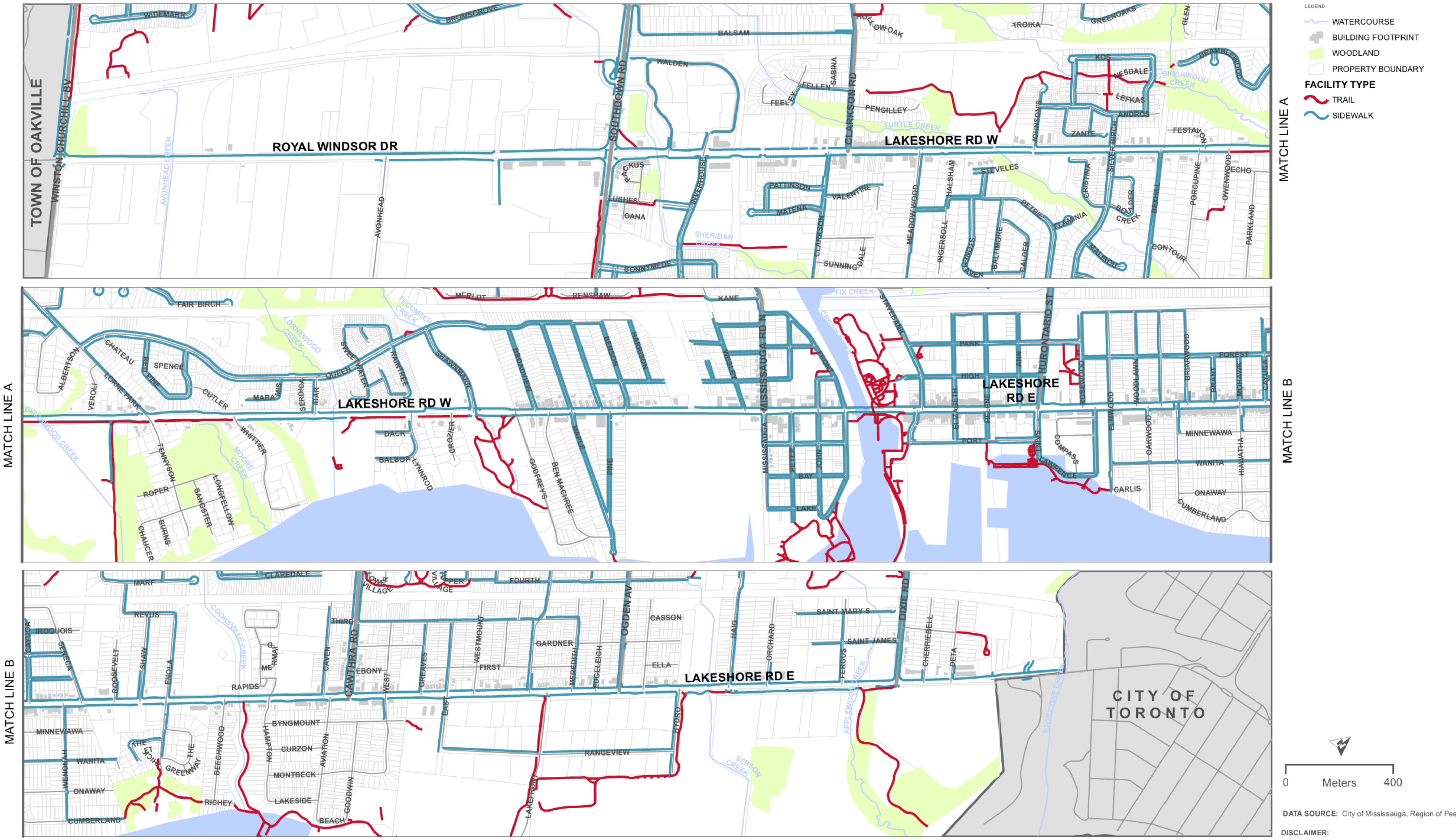
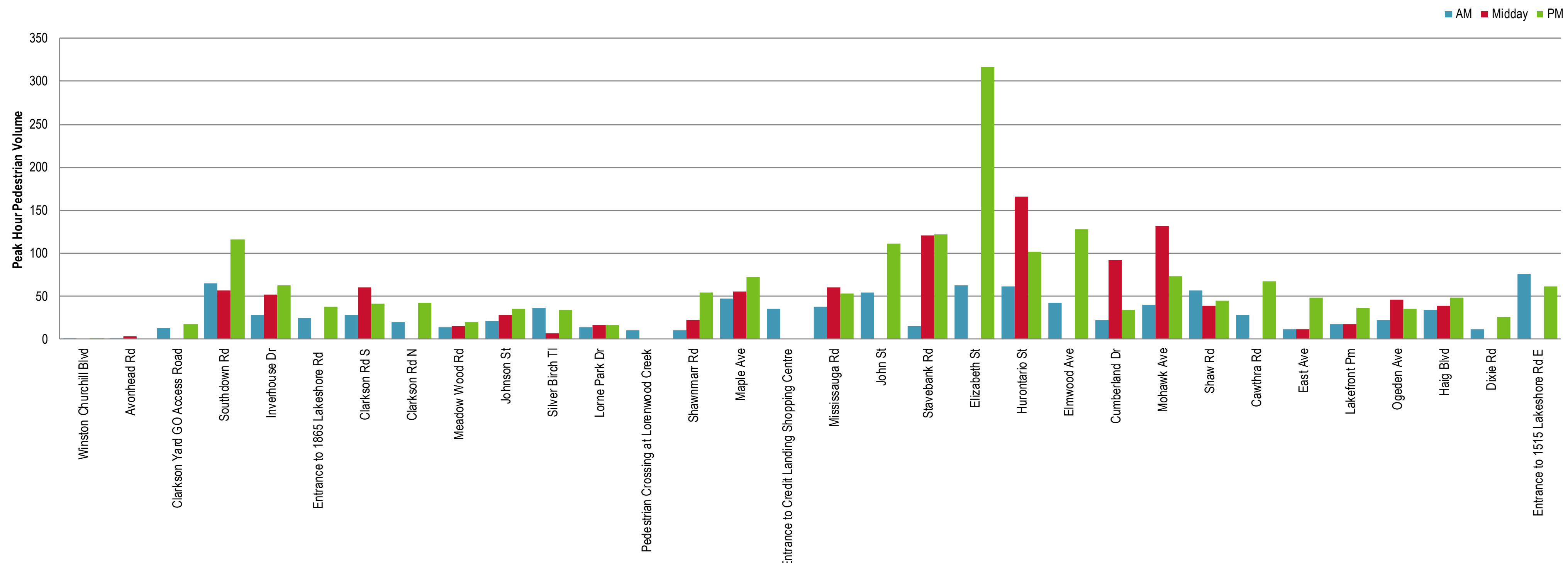


Exhibit 3-15: Existing Pedestrian Network (Sidewalks and Trails)

3.3.2 Pedestrian Demand

Major pedestrian generators include: community nodes or ‘main street’ retail areas, community centres, schools, places of worship, transit hubs, parks and recreational areas. Pedestrian volumes during the AM, midday, and PM peak hours are shown in **Exhibit 3-16** and illustrate the locations of high pedestrian activity along the Study Corridor. There are several of these key pedestrian generators along the Lakeshore Corridor and within the Network Analysis Area such as:

- Clarkson, Port Credit, and Lakeview Community Nodes.
- Port Credit GO Station and Surrounding Area (mobility hub). Intersections along Lakeshore Road within the Port Credit Mobility Hub, including: Stavebank Road, Elizabeth Street, and Hurontario Street have a high level of pedestrian activity compared to the rest of the Study Corridor.
- The intersection of Lakeshore Road and Southdown Road is another location of high pedestrian activity which may be attributed to its proximity to the Clarkson GO Station, commercial-retail lands on the southwest corner and high-rise residential on the northeast corner.
- Clarkson Community Centre and Arena, Lorne Park Hall, Clarke Hall Grounds, Port Credit Arena, Lion’s Park, Mississauga Senior’s Centre, and Cawthra Community Centre.
- St. Lawrence Park, Birchwood Park, Rattray Marsh Conservation Area, Jack Darling Memorial Park, Richard’s Memorial Park, J.C. Saddington Park, J.J. Plaus Park, Port Credit Memorial Park, A.E. Crookes Park, Douglas Kennedy Park, Lakefront Promenade Park, Lakeview Park, and Marie Curtis Park.
- Clarkson Public School, Green Glade Senior Public School, Owenwood Public School, Brian J. Fleming Catholic Adult Learning Centre, Riverside Public School, Forest Avenue Public School, Mentor College, St. James School, and Byngmount Beach Public School.



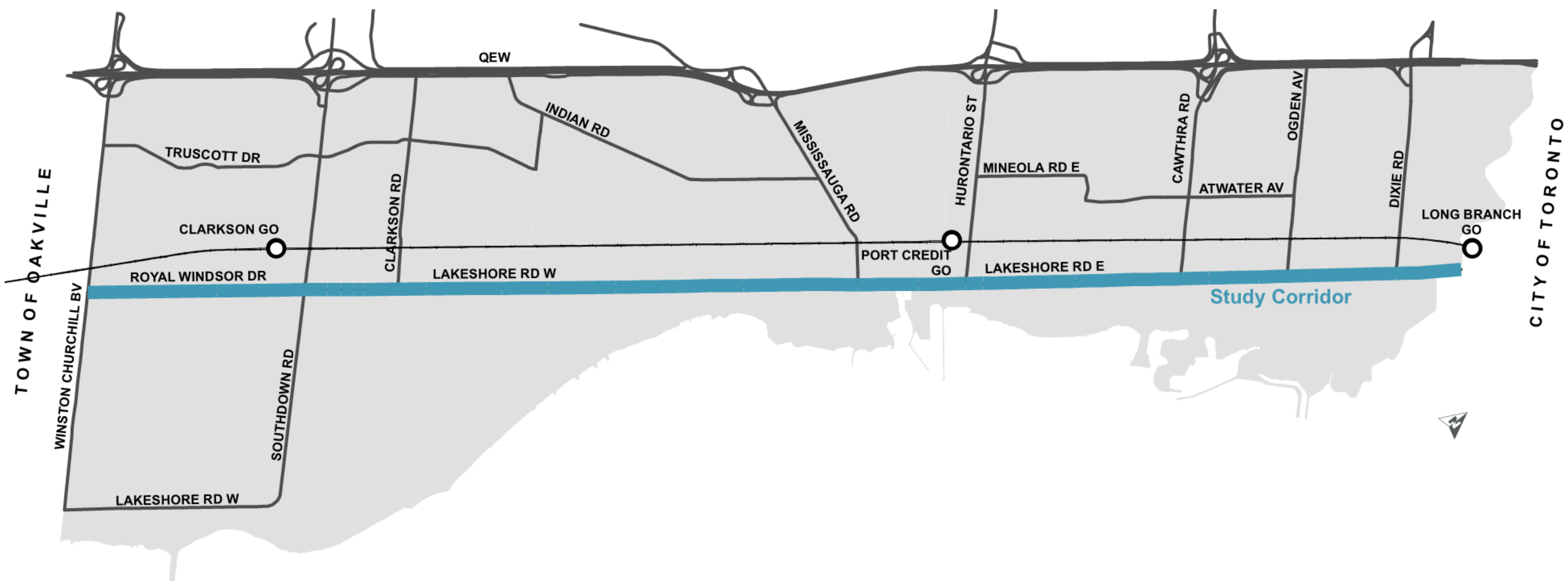


Exhibit 3-16: Peak Hour Pedestrian Volumes

3.3.3 Pedestrian Quality of Service

The methodology employed for this study is based on the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines. These guidelines were selected over other variations mainly for their intuitiveness, accommodation of contemporary facility designs, and explicit recognition that pedestrian LOS should be based on user comfort, safety, and convenience and are thus subjective in nature.

Pedestrian level of service (PLOS) is calculated at the intersection and mid-block in recognition that, unlike vehicular LOS, pedestrian's experience is determined by the conditions both between crossings and at the crossing itself (e.g., a high quality pedestrian crossing may or may not connect to a sidewalk facility at either end).

The methodology for the evaluation of segment PLOS utilizes a look-up table approach based on cross-section and roadway characteristics (e.g., sidewalk and boulevard width, traffic volumes, presence of on-street parking, and operating speed). Intersection PLOS uses the Pedestrian Exposure to Traffic at Signalized Intersections (PETSI) and assigns points based on a number of crossing characteristics (e.g., crossing distance, presence of a median, presence of a crossing refuge, turning restrictions, right hand turn characteristics, curb radii, etc.). The average score of each intersection approach is averaged to determine the overall intersection PLOS.

The look, feel, and function of the Study Corridor changes along its length as does the level of comfort experienced by pedestrians. This variation can be observed in the segment PLOS scores along the length – with generally higher scores observed in locations where there are lower vehicle speeds and volumes, wide sidewalks and larger boulevards with ample separation from moving traffic as in **Exhibit 3-17**. Lower scores are observed in locations with high vehicle speeds, narrow sidewalks and minimal separation from moving traffic as in **Exhibit 3-18**. Similarly, intersection PLOS varies along the Study Corridor with the majority of intersections between PLOS ‘C’ and ‘D’. Intersection PLOS scores in the range of ‘C’ to ‘D’ are indicative of shorter crossing distances (4 lanes), relatively small corner radii, and zebra crosswalk treatments as in **Exhibit 3-19**. In contrast, the intersection of Royal Windsor Drive and Southdown Road as shown in **Exhibit 3-20** has an intersection PLOS of ‘F’ since pedestrians must cross a total of five lanes plus two additional channelized right turn lanes at each end. While the crossing distance alone results in a very low score to start, the zebra treatment and right hand turning channels (which break up the crossing distance somewhat) do contribute to a slightly higher numeric score, though this still is considered an ‘F’ in the Ottawa scoring methodology.

Exhibit 3-17: Segment PLOS 'B' – Wide sidewalk, landscaped wide buffer, 50km/hr vehicle operating speeds.

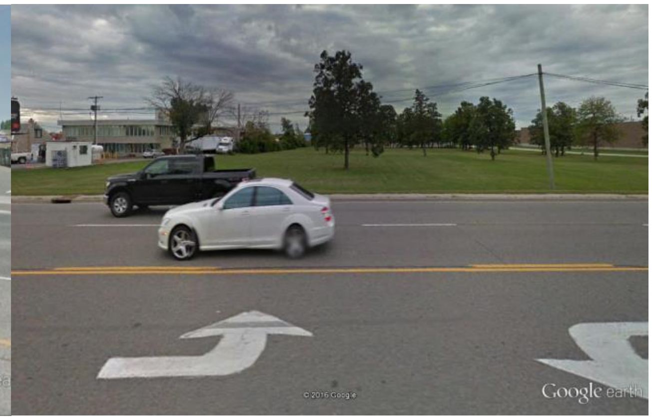


Exhibit 3-18: Segment PLOS 'F' – Narrow sidewalk, no buffer, 60km/hr vehicle operating speeds.

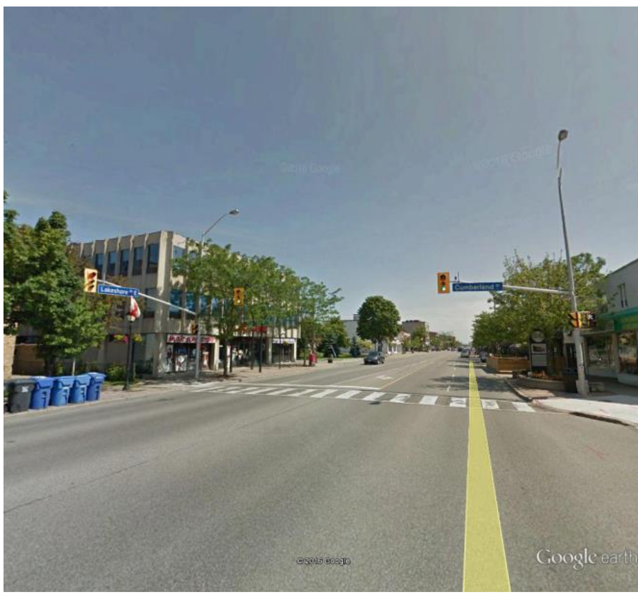


Exhibit 3-19: Intersection PLOS 'C' – Shorter crossing distance, small curb radii, zebra crosswalk treatment.

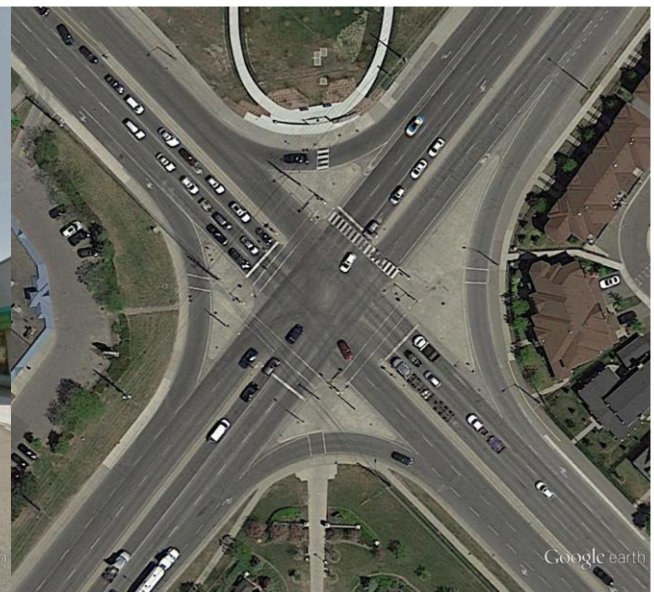


Exhibit 3-20: Intersection PLOS 'F' – Long crossing distance, large curb radii, standard crosswalk treatment.

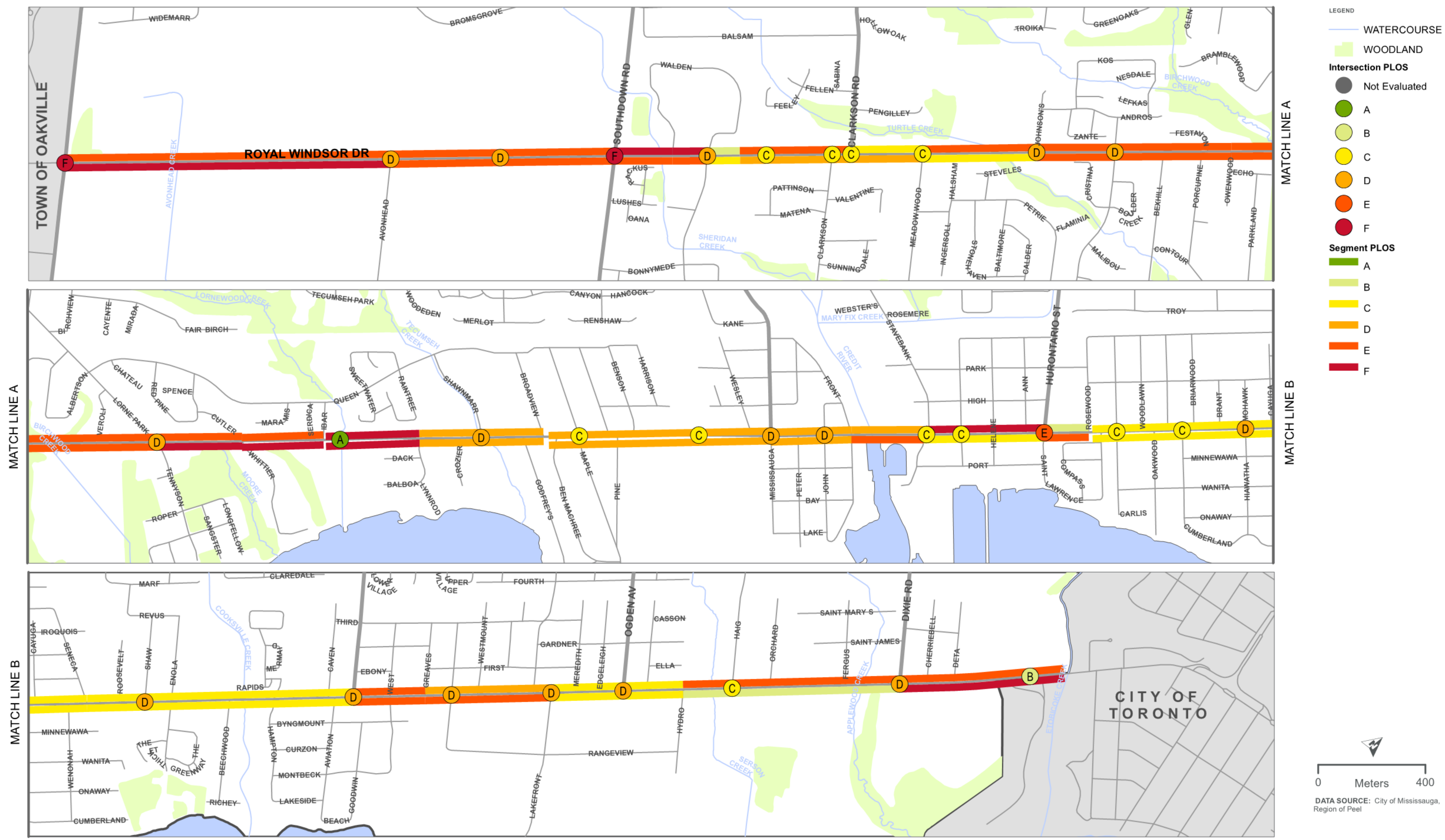


Exhibit 3-21: Pedestrian Quality of Service

3.4 Cyclists

The following section describes the existing network, demand and quality of service with respect to cycling within the Study Corridor and Network Analysis Area.

3.4.1 Cycling Network

The existing cycling network within the Network Analysis Area is illustrated in **Exhibit 3-26.** There are three types of cycling facilities within the Study Corridor, including: paved multi-use trails, shared use lanes (sharrows), and signed bike routes.

Paved multi-use trails are typically 3 to 4.5 metres wide and are located within the boulevard either separated by a landscaped buffer (**Exhibit 3-22**) or directly adjacent to the roadway (**Exhibit 3-23**).

Exhibit 3-22: Paved Multi-use Trail (Hydro Road to Dixie Road) – Separated by Landscaped Buffer

Exhibit 3-23: Paved Multi-use Trail (Godfrey's Lane to Meadow Wood Road) – Adjacent to Roadway

Shared use lanes, also known as sharrows, are designated by two chevrons painted above a bicycle symbol on the road indicating the lane is to be shared between vehicles and bicycles. The symbol is typically painted close to the right edge of the road and signals cyclists moving at lower speeds to ride about one metre from the curb or parked cars, or as close as practical to the right-hand edge of the road when there is no curb. Vehicles are required, by law, to maintain a minimum distance of one metre, where practical between their vehicle and the cyclist and whenever possible, change lanes to pass. Cyclists are not required to ride close to the right edge of the road when they are travelling at or faster than the normal speed of traffic at that time and place, or when they are turning left, or getting in position to turn left. Sharrows are provided on both sides of Lakeshore Road between Meadow Wood Road and Southdown Road as shown in **Exhibit 3-24**.

Signed bike routes are streets which have signs to indicate that the street is also a bike route and cars and bicycles are to share the road as shown in **Exhibit 3-25**. Signed bike routes are typically found in the Network Analysis Area to connect different sections of the Waterfront Trail to one another through neighbourhoods.

Exhibit 3-24: Sharrow (Meadow Wood Road and Southdown Road)

Exhibit 3-25: Signed Bike Route (Petrie Way – Waterfront Trail)

Cycling facilities along the corridor are neither continuous nor contiguous and several gaps are present where cyclists do not have a dedicated space within the ROW allocated for them. The gaps are located between the following segments:

- Royal Windsor Drive: Winston Churchill Boulevard to Southdown Road
- Lakeshore Road: Godfrey's Lane to Hydro Road
- Lakeshore Road: Dixie Road to the east City limit

Within the vicinity of the Study Corridor, adjacent local roads are designated as signed bike routes which allow cyclists to access the Waterfront and the Waterfront Trail. The Waterfront Trail is also not continuous through the Network Analysis Area; however, it acts as a quasi by-pass for cyclists traversing Lakeshore Road.

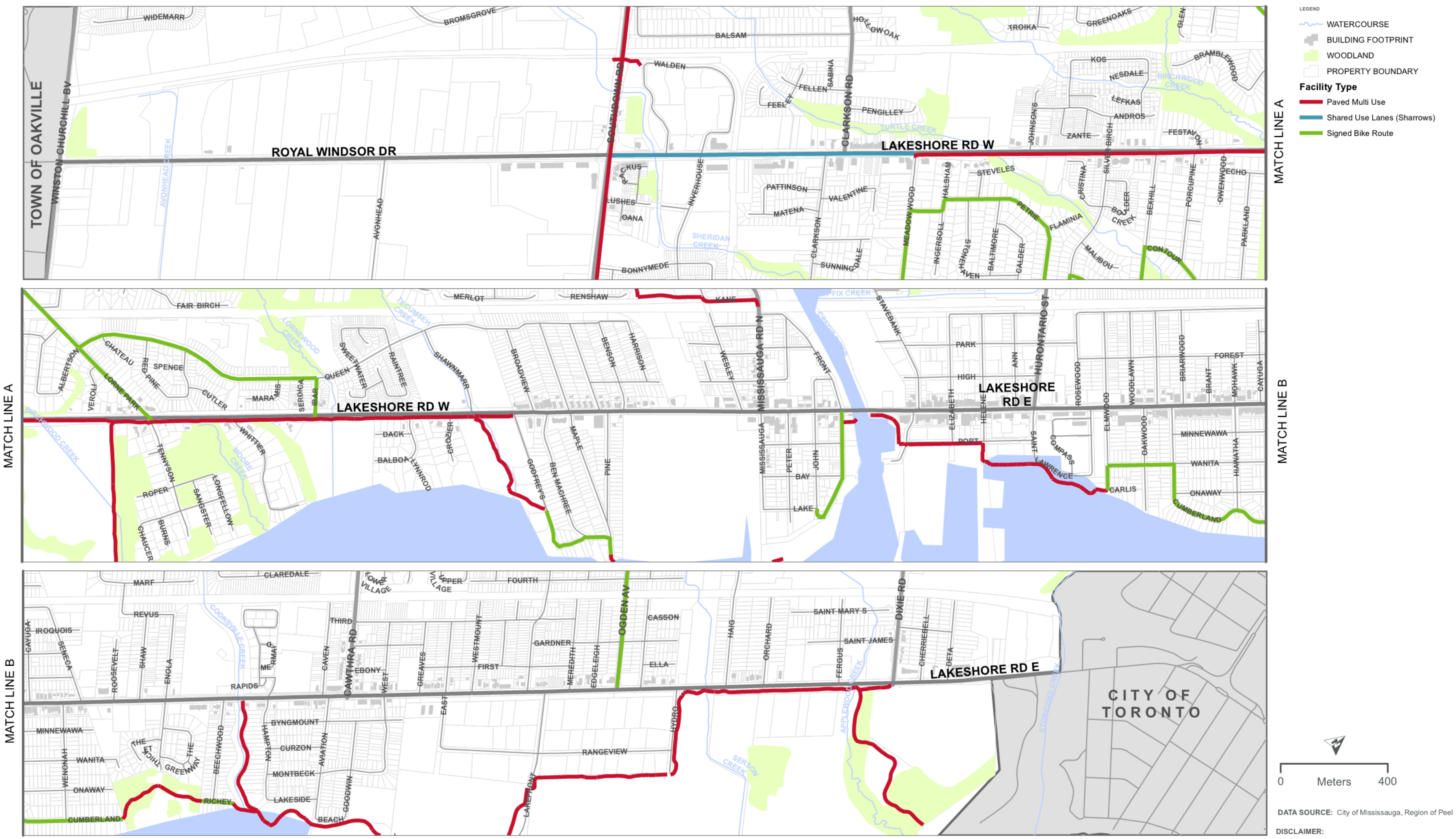


Exhibit 3-26: Existing Cycling Network

3.4.2 Cycling Demand

Cyclists can be categorized in two ways: utilitarian or recreational. Utilitarian cyclists are those who cycle simply as a means of transport rather than recreational cyclists who cycle for sport or activity. Utilitarian cyclists tend to be concentrated to the same peak travel times as motorists and transit users; where as recreational cyclists tend to use facilities during off peak periods such as the evening and on weekends.

No data is available to support an analysis of the types of riders along the corridor; however, from site observations there tends to be more recreational cyclists compared to utilitarian. This is consistent with the uses in the corridor and the proximity to major parks, open space, and the waterfront.

Exhibit 3-27 presents cycling volumes during the AM, midday, and PM peak hours along the Study Corridor. Only intersections with cyclist activity have been shown. Cyclist volumes are generally larger in the Port Credit and Lakeview Character Areas compared to Clarkson which is consistent with the proximity of Lakeshore Road to the waterfront in these areas and the multitude of connections to the Waterfront Trail.

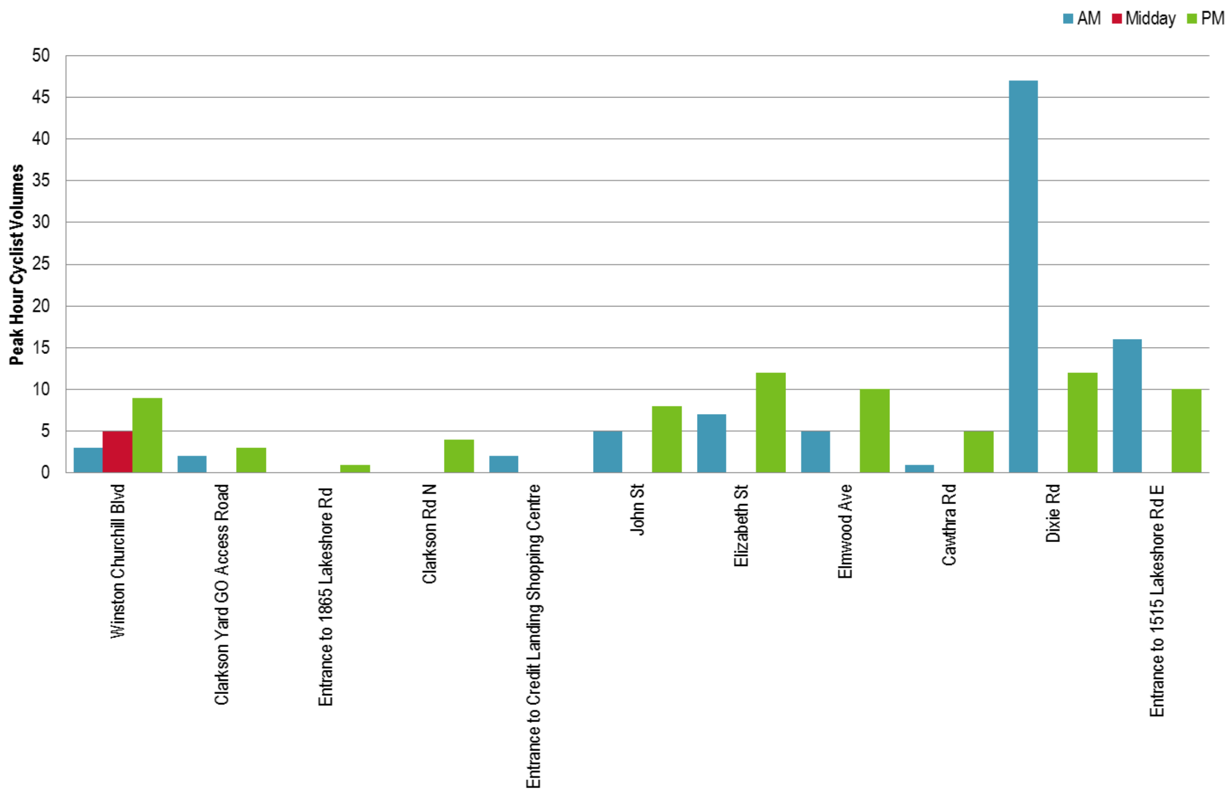


Exhibit 3-27: Peak Hour Cycling Volumes

3.4.3 Cycling Quality of Service

As noted in **Section 3.3.3**, the methodology employed for this study is based on the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines. These guidelines were selected over other variations mainly for their intuitiveness, accommodation of contemporary facility designs, and explicit recognition that bicycle LOS should be based on user comfort, safety, and convenience and are thus subjective in nature.

Bicycling level of service (BLOS) is calculated at the intersection and mid-block in recognition that, unlike vehicular LOS, a cyclist's experience is determined by the conditions both between crossings and at the crossing itself.

The BLOS methodology is similar to the PLOS method explained in **Section 3.3.3,** and is based on roadway characteristics and facility type and quality. The methodology measures each segment's and intersection's level of traffic stress (LTS) experienced by the cyclist, established in the Mineta Transportation Institute report (no. 11-19). Each LTS score is associated with a category of cyclist (e.g. "all ages" to "very confident cyclists only") and score (A to F). Segment BLOS are calculated using a look-up table approach and considers facility type, street width, operating speed, and parking characteristics. At the intersection, the left and right turning conditions are evaluated with a look-up table approach as well and the average score of the approaches is used to determine the overall intersection BLOS.

Segment BLOS is most sensitive to facility type, with physically separated bikeways such as cycle tracks, protected bike lanes and multi-use paths receiving a score of 'A' while cycling in mixed traffic conditions with varying operating speeds and street widths generally scoring lower – 'D' to 'F'.

The multi-use path along Lakeshore Road has a BLOS of 'A' while the shared use lanes (i.e. sharrows) between Meadow Wood Road and Southdown Road have a score of 'E' and 'F'. The remainder of the Study Corridor does not accommodate cyclists in a separate facility and is mixed traffic; therefore, segment BLOS ranges between 'E' and 'F' as expected due to the four lane cross-section and 50 to 60 km/hr speed limit.

Intersections do not accommodate cyclists making left or right turns in a controlled manner. Cyclists operate in mixed traffic and are subject to crossing several lanes to make left turns and traversing long right turn lanes; therefore, the majority of intersections receive an intersection BLOS between 'E' and 'F' with few intersections in the more human-scaled main street area of Port Credit receiving a score between 'C' and 'D'.

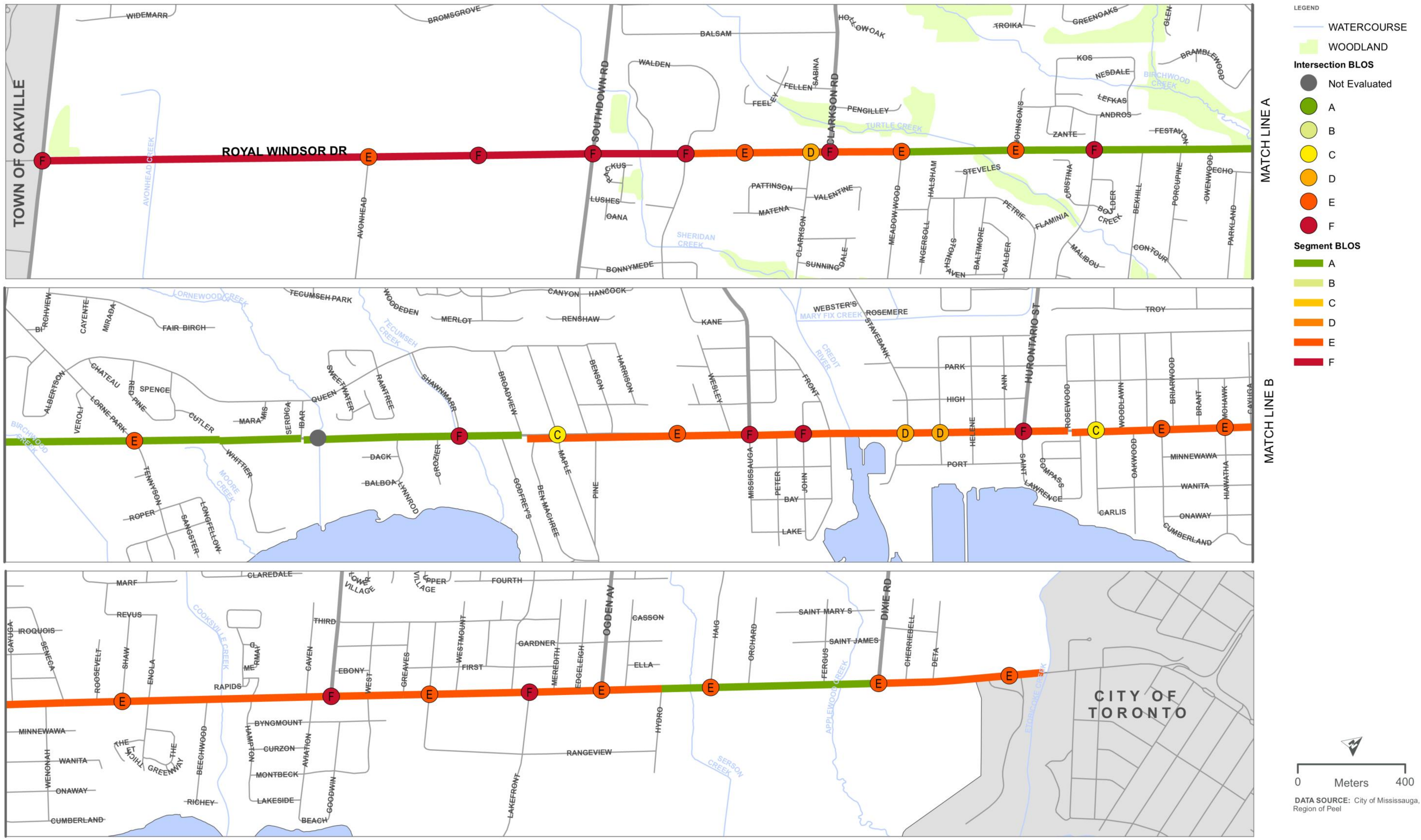


Exhibit 3-28: Cycling Quality of Service

3.5 Transit

The following section describes the existing networks, demand and quality of service with respect to transit within the Study Corridor, Network Analysis Area, and Strategic Analysis Area.

3.5.1 Transit Network

The Strategic Analysis Area is served by three categories of transit networks: local, regional, and inter-municipal connectors. This section describes the local MiWay network, the regional GO Transit network, and inter-municipal connecting transit networks (i.e. Oakville Transit and the Toronto Transit Commission).

MIWAY

The weekday MiWay routes serving the Strategic Analysis Area and location of transit stops are illustrated in **Exhibit 3-29** and listed in **Table 3-5**. An inventory of all bus stops along the Study Corridor including the routes they serve, type of stop, docking type, and whether the stop has a shelter or sidewalk access is provided in **Table 3-6**. There is a mix of bus stop typologies along Lakeshore Road, including: on-street stops, bus bays, near and far side stops, and bus shelters. Bus bays were provided during the time that Lakeshore Road was under the jurisdiction of the Ministry of Transportation (MTO) and since conversion to a local road, MiWay has progressively eliminated bus bays where possible in favour of on-street stops. Existing bus bays do not currently accommodate MiWay's sixty-foot buses.

Table 3-5: MiWay Study Corridor Transit Routes

Route
5 Dixie
8 Cawthra
14 Lorne Park and 14A Lorne Park Industrial
19 Hurontario
23 Lakeshore
29 Park Royal
45 Winston Churchill
103 Hurontario Express
110 University Express
335 Allan A. Martin

GO TRANSIT

The Strategic Analysis Area is served by GO Transit's Lakeshore West Line. The Lakeshore West Line operates between Union Station in Toronto and Aldershot Station in Burlington with limited service to Hamilton with stops at Long Branch, Port Credit, and Clarkson in the vicinity of the Study Corridor and within the Network Analysis Area.

INTER-MUNICIPAL CONNECTING TRANSIT

In addition to the routes listed in **Table 3-5**, Oakville Transit (OT) and the Toronto Transit Commission (TTC) provide local transit connections at key transfer stations. MiWay transit routes 5 and 23 connect to the Long Branch GO Station and TTC loop for connections to the GO Lakeshore West Line and TTC routes 110, 123, 501, and 508. Oakville Transit operates routes 4, 21,102, and 25 to Clarkson GO Station for connections to the GO Lakeshore West Line and MiWay routes 13, 14, 23, 29, 45, and 110.

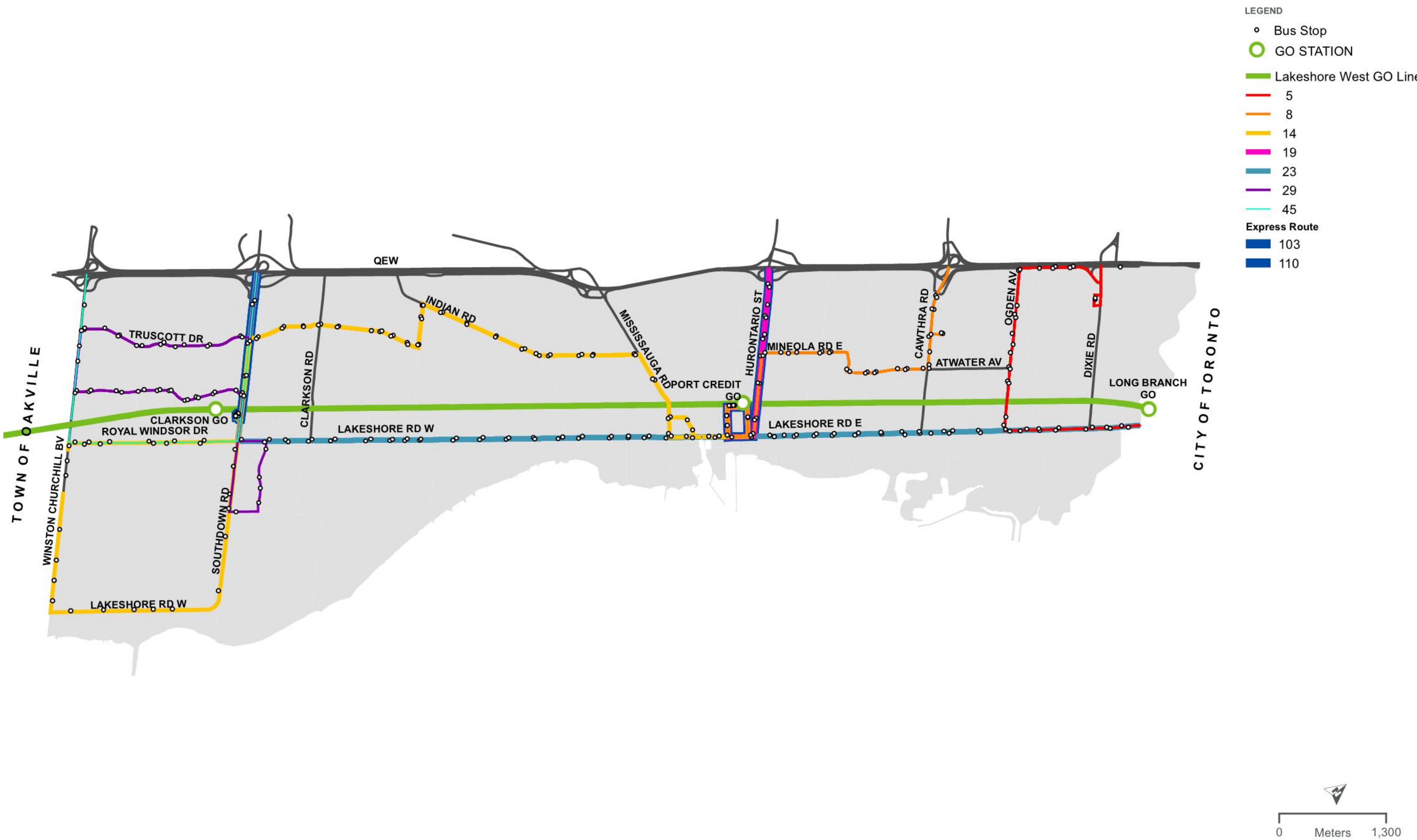


Exhibit 3-29: Existing Transit Network

Table 3-6: Bus Stop Inventory

Stop ID	Stop Name	Routes Served	Direction Served	Type	Docking Type	Shelter	Sidewalk Access
208	LAKESHORE RD W at INVERHOUSE DR	23	EB	Near side	On-street	Yes	Yes
209	LAKESHORE RD W west of CLARKSON RD	23	EB	Far side	On-street	Yes	Yes
210	LAKESHORE RD W at CLARKSON RD	23	EB	Near side	On-street	Yes	Yes
211	LAKESHORE RD W at MEADOW WOOD RD	23	EB	Near side	On-street	Yes	Yes
214	LAKESHORE RD W at SILVER BIRCH TRAIL	23	EB	Near side	On-street	Yes	Yes
215	LAKESHORE RD W at BEXHILL RD	23	EB	Near side	On-street	No	Yes
216	LAKESHORE RD W at TENNYSON AVE	23	EB	Near side	Turn Lane	Yes	Yes
217	LAKESHORE RD W at WHITTIER CRES	23	EB	Far side	On-street	No	Yes
218	LAKESHORE RD W at MAPLE AVE S	23	EB	Near side	On-street	Yes	Yes
219	LAKESHORE RD W at SHAWNMARR RD	23	EB	Near side	On-street	Yes	Yes
221	LAKESHORE RD W at BENSON AVE	23	EB	Near side	On-street	Yes	Yes
222	LAKESHORE RD W east of BENSON AVE	23	EB	Near side	On-street	Yes	Yes
223	LAKESHORE RD W at MISSISSAUGA RD	23	EB	Near side	On-street	Yes	Yes
224	LAKESHORE RD W at FRONT ST S	14, 23	EB	Near side	On-street	No	Yes
225	LAKESHORE RD W at FESTAVON CRT	23	EB	Near side	On-street	No	Yes
266	LAKESHORE RD W at JOHNSONS LANE	23	WB	Near side	On-street	Yes	Yes
267	LAKESHORE RD W at JOHN ST N	23	WB	Near side	On-street	No	Yes
268	LAKESHORE RD W at MISSISSAUGA RD	23	WB	Near side	On-street	No	Yes
269	LAKESHORE RD W at BENSON AVE	23	WB	Near side	On-street	No	Yes
270	LAKESHORE RD W at MAPLE AVE N	23	WB	Near side	On-street	No	Yes
272	LAKESHORE RD W at SHAWNMARR RD	23	WB	Near side	On-street	Yes	Yes
274	LAKESHORE RD W at WHITTIER CRES	23	WB	Midblock	On-street	No	Yes
275	LAKESHORE RD W at LORNE PARK RD	23	WB	Near side	Turn Lane	Yes	Yes
276	LAKESHORE RD W at FESTAVON CRT	23	WB	Near side	On-street	No	Yes
277	LAKESHORE RD W at BEXHILL RD	23	WB	Midblock	On-street	No	Yes
278	LAKESHORE RD W at SILVER BIRCH TRAIL	23	WB	Near side	On-street	Yes	Yes
279	LAKESHORE RD W at MEADOW WOOD RD	23	WB	Near side	On-street	No	Yes
280	LAKESHORE RD W at CLARKSON RD N	23	WB	Near side	On-street	No	Yes
281	LAKESHORE RD W west of CLARKSON RD NORTH	23	WB	Near side	On-street	No	Yes
282	LAKESHORE RD W at WALDEN CIRCLE	23	WB	Near side	On-street	Yes	Yes
291	LAKESHORE RD W at BALBOA DR	23	WB	Midblock	On-street	No	Yes
292	LAKESHORE RD W at IBAR WAY	23	WB	Near side	On-street	No	Yes
295	LAKESHORE RD W at IBAR WAY	23	EB	Near side	On-street	No	Yes
296	LAKESHORE RD W at BALBOA DR	23	EB	Near side	On-street	No	Yes
302	ELIZABETH ST at LAKESHORE RD	14, 23	WB	Near side	On-street	Yes	Yes
323	LAKESHORE RD W at PORT ST	23	EB	Near side	Turn Lane	Yes	Yes
325	LAKESHORE RD W at STAVEBANK RD S	14,23	EB	Near side	On-street	No	Yes
326	LAKESHORE RD E east of ELIZABETH ST	8, 14, 19, 23,103	EB	Far side	On-street	Yes	Yes
353	LAKESHORE RD E at ELMWOOD AVE	23	EB	Near side	On-street	Yes	Yes
354	LAKESHORE RD E at CUMBERLAND DR	23	EB	Near side	On-street	No	Yes

Stop ID	Stop Name	Routes Served	Direction Served	Type	Docking Type	Shelter	Sidewalk Access
355	LAKESHORE RDE at HIAWATHA PKY	23	EB	Near side	On-street	No	Yes
356	LAKESHORE RD E at WENONAH DR	23	EB	Near side	On-street	No	Yes
357	LAKESHORE RD E at SHAW DR	23	EB	Near side	Turn Lane	Yes	Yes
358	LAKESHORE RD E at SHAW DR	23	WB	Near side	Bay	No	Yes
359	LAKESHORE RD E at WENONAH DR	23	WB	Midblock	On-street	No	Yes
360	LAKESHORE RD E at MOHAWK AVE	23	WB	Near side	On-street	No	Yes
361	LAKESHORE RD E at CUMBERLAND DR	23	WB	Near side	On-street	No	Yes
362	LAKESHORE RD E at WOODLAWN AVE	23	WB	Near side	On-street	No	Yes
363	LAKESHORE RD W at HURONTARIO ST	23	WB	Far side	On-street	No	Yes
377	LAKESHORE RD W at STAVEBANK RD	14, 23	WB	Near side	On-street	No	Yes
378	LAKESHORE RD W west of STAVEBANK RD	14, 23	WB	Midblock	On-street	Yes	Yes
408	LAKESHORE RD E at DIXIE RD	5, 23	WB	Near side	On-street	Yes	Yes
435	LAKESHORE RD E at BEECHWOOD AVE	23	EB	Near side	Bay	No	Yes
436	LAKESHORE RD E at HAMPTON CRES	23	EB	Far side	Bay	Yes	Yes
437	LAKESHORE RD E at CAWTHRA RD	23	EB	Near side	On-street	No	Yes
438	LAKESHORE RD E at EAST AVE	23	EB	Near side	Turn Lane	Yes	Yes
439	LAKESHORE RD E at LAKEFRONT PROMENADE	23	EB	Near side	Turn Lane	No	Yes
440	LAKESHORE RD E at STRATHY AVE	5, 23	EB	Near side	Bay	Yes	Yes
441	LAKESHORE RD E at HAIG BLVD	5, 23	EB	Far side	Bay	Yes	Yes
442	LAKESHORE RD E east of ORCHARD RD	5, 23	EB	Midblock	Bay	Yes	Yes
443	LAKESHORE RD E at DIXIE RD	5, 23	EB	Near side	Bay	No	Yes
444	LAKESHORE RD E east of DETA RD	5, 23	EB	Midblock	On-street	Yes	No
445	LAKESHORE RD E east of ISLAND RD	5, 23	EB	Near side	Bay	No	Yes
447	LAKESHORE RD west of FORTY-THIRD ST	5, 23	WB	Midblock	Bay	Yes	Yes
448	LAKESHORE RD E at DETA RD	5, 23	WB	Near side	On-street	No	Yes
450	LAKESHORE RD E west of FERGUS AVE	5, 23	WB	Midblock	Bay	Yes	Yes
451	LAKESHORE RD E at HAIG BLVD	5, 23	WB	Near side	On-street	No	Yes
452	LAKESHORE RD E at OGDEN AVE	5, 23	WB	Near side	On-street	No	Yes
453	LAKESHORE RD E at ALEXANDRA AVE	23	WB	Near side	On-street	Yes	Yes
454	LAKESHORE RD at EAST AVE	23	WB	Near side	Turn Lane	No	Yes
455	LAKESHORE RD E at CAWTHRA RD	23	WB	Far side	Bay	No	Yes
456	LAKESHORE RD E at HAMPTON CRES	23	WB	Midblock	Bay	Yes	Yes
457	LAKESHORE RD E at BEECHWOOD AVE	23	WB	Midblock	Bay	No	Yes
471	LAKESHORE RD at FORTY-THIRD ST	5, 23	WB	Near side	On-street	No	Yes
472	LAKESHORE RD at FORTY-FIRST ST	5, 23	EB	Near side	On-street	No	Yes
581	LAKESHORE RD at JOHNSONS LANE	23	EB	Near side	On-street	Yes	Yes
637	LAKESHORE RD W west of WESLEY AVE	23	WB	Near side	Turn Lane	Yes	Yes
843	LAKESHORE RD west of LORNE PARK RD	23	WB	Midblock	On-street	No	Yes
881	LAKESHORE RD E at ST LAWRENCE DR	23	WB	Midblock	On-street	Yes	Yes
909	LAKESHORE RD at OWENWOOD DR	23	EB	Near side	On-street	No	Yes
1683	LAKESHORE RD E at GREAVES AVE	23	WB	Near side	On-street	No	Yes

Stop ID	Stop Name	Routes Served	Direction Served	Type	Docking Type	Shelter	Sidewalk Access
1813	LAKESHORE RD E at MONTBECK CRES	23	EB	Far side	On-street	No	Yes
2351	ROYAL WINDSOR DR FIRST east of WINSTON CHURCHILL	14, 45	EB	Midblock	On-street	No	No
2352	ROYAL WINDSOR DR SECOND east of WINSTON CHURCHILL	45	EB	Midblock	On-street	No	No
2353	ROYAL WINDSOR DR at AVONHEAD RD	14, 45	EB	Near side	On-street	No	Yes
2649	LAKESHORE RD at SOUTHDOWN RD	23	WB	Near side	Turn Lane	No	Yes
2682	ROYAL WINDSOR DR THIRD east of WINSTON CHURCHILL	14, 45	EB	Near side	On-street	No	No
2744	LAKESHORE RD E at HYDRO RD	5, 23	EB	Near side	On-street	No	Yes
2745	LAKESHORE RD E at HYDRO RD	5, 23	WB	Near side	On-street	No	Yes
2906	ROYAL WINDSOR DR east of AVONHEAD RD	14, 45	EB	Near side	Turn Lane	No	Yes
3114	ROYAL WINDSOR DR SECOND STOP west of SOUTHDOWN RD	45	WB	Near side	On-street	No	Yes
3141	ROYAL WINDSOR DR FIRST STOP west of SOUTHDOWN RD	45	WB	Near side	Turn Lane	No	Yes
3142	ROYAL WINDSOR DR SECOND STOP west of AVONHEAD RD	45	WB	Midblock	On-street	No	Yes
3143	ROYAL WINDSOR DR FIRST STOP west of AVONHEAD RD	45	WB	Near side	On-street	No	No
4500	ROYAL WINDSOR DR at WINSTON CHURCHILL BLVD	45	WB	Near side	Turn Lane	No	Yes
4540	ROYAL WINDSOR DR THIRD STOP west of AVONHEAD RD	45	WB	Midblock	On-street	No	Yes

3.5.2 Transit Demand

MiWay collected daily bus boarding and alighting counts for a typical weekday and weekend for all routes serving the Study Corridor in Fall 2015. **Table 3-7** presents the total daily ridership in persons for each route.

Table 3-7: Total Daily Transit Ridership (Fall 2015)

Route	Weekday	Saturday	Sunday
Route 19	11258	8275	8244
Route 103	9285	2655	-
Route 110	8528	2380	1599
Route 5	7574	4020	2337
Route 23	4404	2241	1364
Route 8	2239	498	-
Route 29	2177	1255	705
Route 45	1689	709	466
Route 14	430	-	-

The main bus route which runs the entire length of the Study Corridor – route 23 – has a total daily ridership of 4404 persons. In the AM peak period (6 – 9 AM) the total ridership is 853 persons and the PM peak period (3 – 7 PM) ridership is 1482 persons.

Exhibit 3-34 illustrates the total daily boarding and alighting counts for route 23 along the Study Corridor. The busiest bus stops are the Clarkson, Port Credit, and Long Branch GO Station platforms as well as the intersections of Lakeshore Road/Elizabeth Street and Lakeshore Road/Hurontario Street. Other locations with high transit activity include Lakeshore Road/Cawthra Road and Lakeshore Road/Ogden Avenue.

AM PEAK PERIOD

During the AM peak period in the eastbound direction, route 23 generally picks up passengers between Clarkson GO Station and Port Credit GO Station where the majority of riders alight and new riders board. From the Port Credit GO Station, ridership grows slightly with the majority of passengers alighting at Long Branch GO Station. Total ridership in the eastbound direction during the AM peak period is 425 persons. The maximum load during the AM peak period in the eastbound direction occurs at Lakeshore Road and Cawthra Road with 208 passengers as shown in **Exhibit 3-30**.

During the AM peak period in the westbound direction, route 23 generally picks up passengers between Long Branch GO Station and Port Credit GO Station where the majority of riders alight and new riders board. From the Port Credit GO Station, ridership remains fairly stable with the majority of people alighting at the Clarkson GO Station. Total ridership in the westbound direction during the AM peak period is 428 persons.

The maximum load during the AM peak period in the westbound direction occurs at Lakeshore Road and Woodlawn Avenue with 203 passengers as shown in **Exhibit 3-31**.

The peak hour ridership in the peak direction (i.e. eastbound direction) is 197 persons and occurs between 6:30 AM and 7:30 AM.

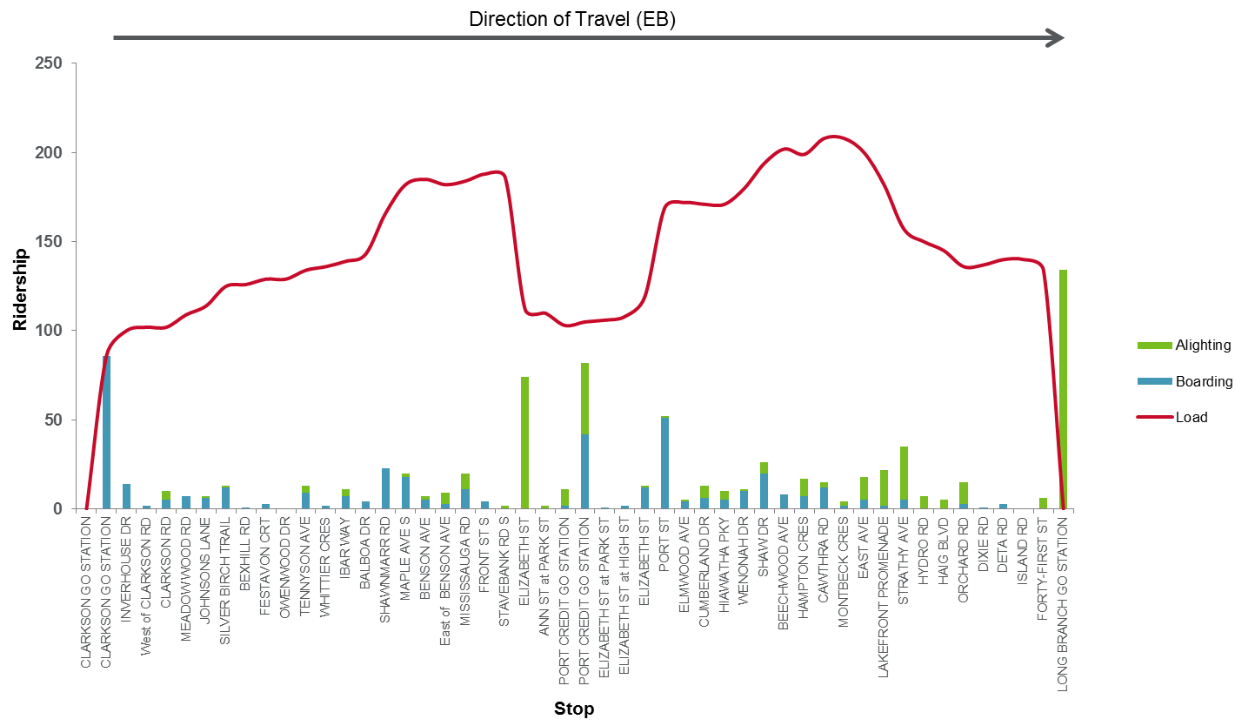


Exhibit 3-30: Eastbound (EB) AM Peak Period Ridership (Route 23)

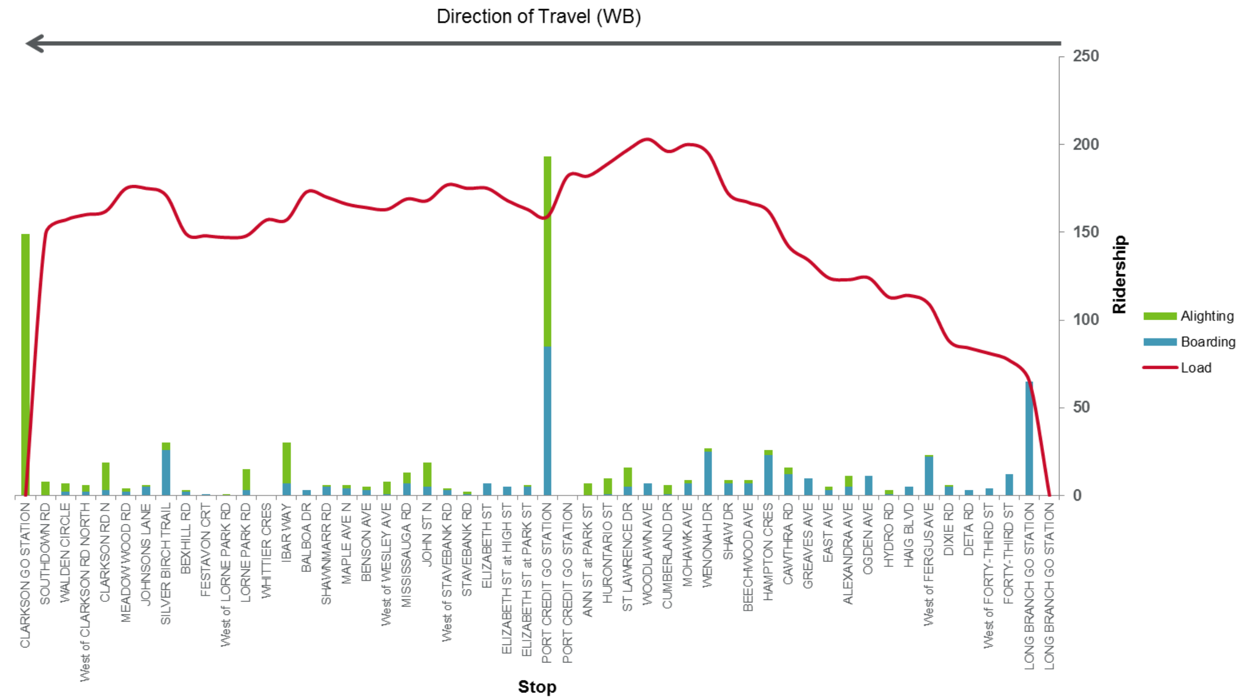


Exhibit 3-31: Westbound (WB) AM Peak Period Ridership (Route 23)

PM PEAK PERIOD

During the PM peak period in the eastbound direction a similar pattern to the AM peak period is observed where passengers board at Clarkson GO Station and alight at Port Credit GO Station and new passengers board and alight at Long Branch GO Station. Total ridership in the eastbound direction during the PM peak period is 701 persons. The maximum load in the eastbound direction during the PM peak period is 281 passengers at Lakeshore Road and Hiawatha Parkway as shown in **Exhibit 3-32**.

During the PM peak period in the westbound direction route 23 picks up passengers at Long Branch GO Station and some alight at Port Credit GO Station; however, the majority remain on the bus and alight between Port Credit and Clarkson. Total ridership in the westbound direction during the PM peak period is 781 persons. The maximum load in the westbound direction during the PM peak period is 316 passengers at Lakeshore Road and Greaves Avenue as shown in **Exhibit 3-33**.

The peak hour ridership in the peak direction (i.e. westbound direction) is 243 persons and occurs between 5:00 PM and 6:00 PM.

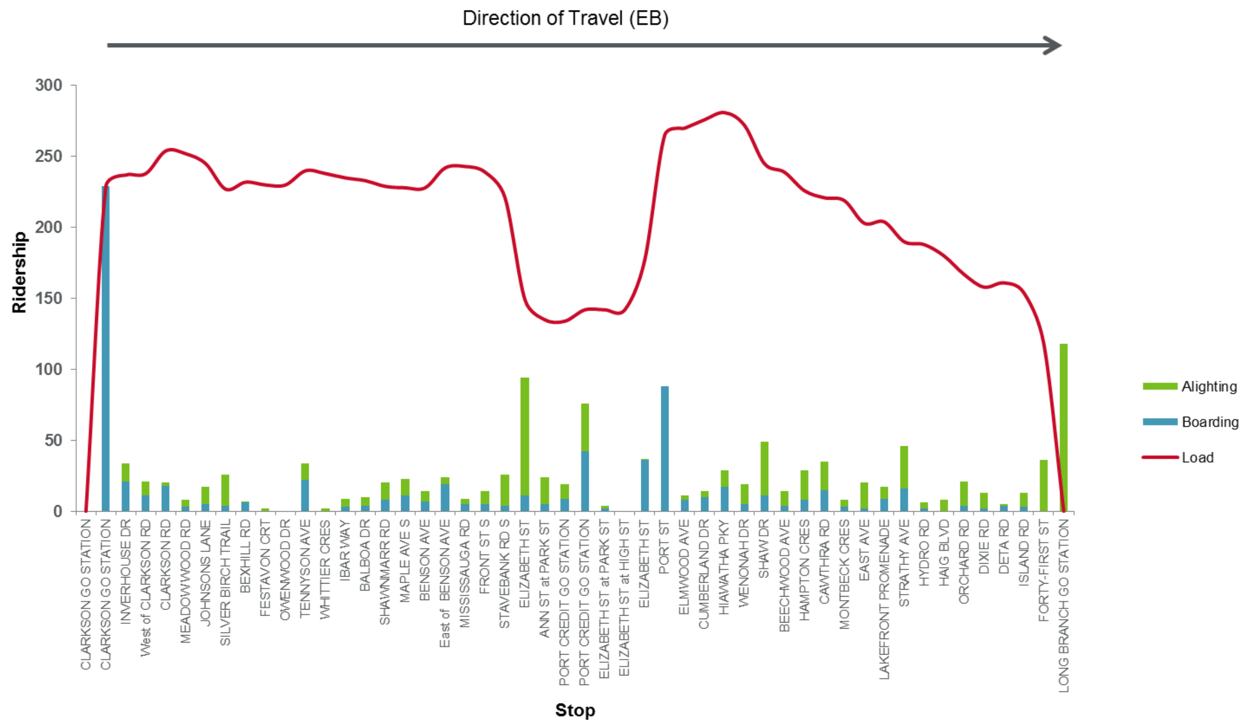


Exhibit 3-32: Eastbound (EB) PM Peak Period Ridership (Route 23)

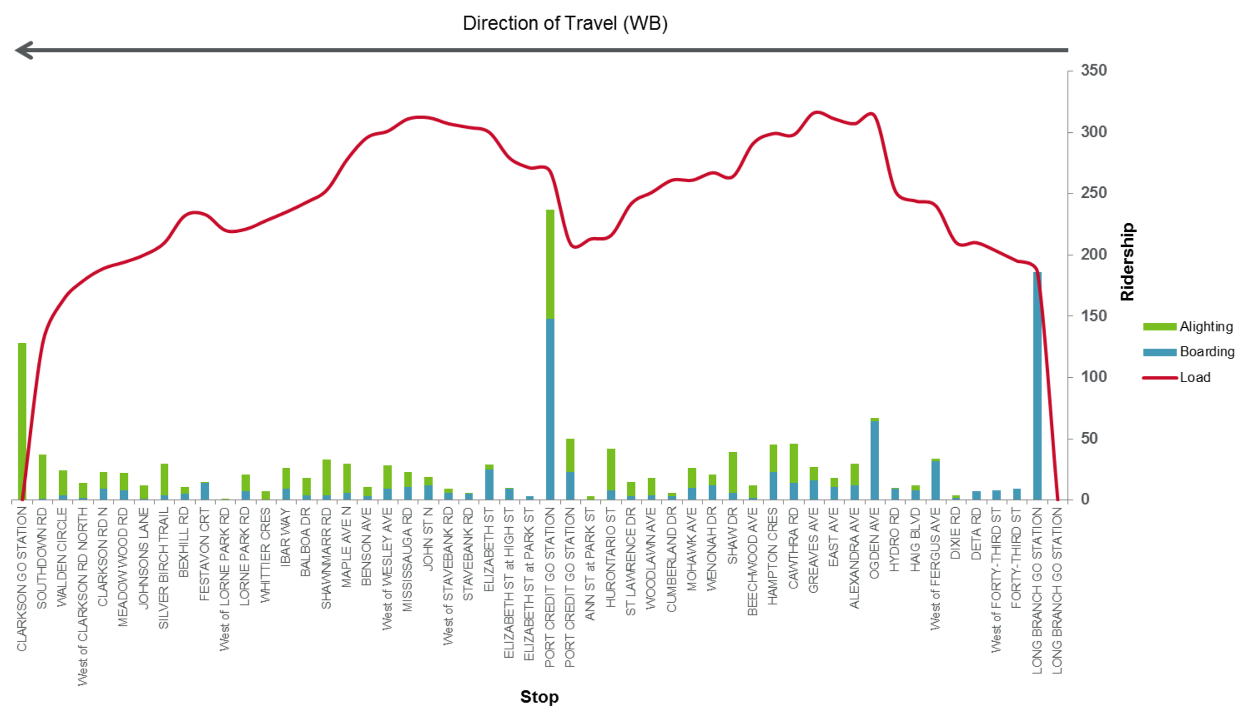


Exhibit 3-33: Westbound (WB) PM Peak Period Ridership (Route 23)

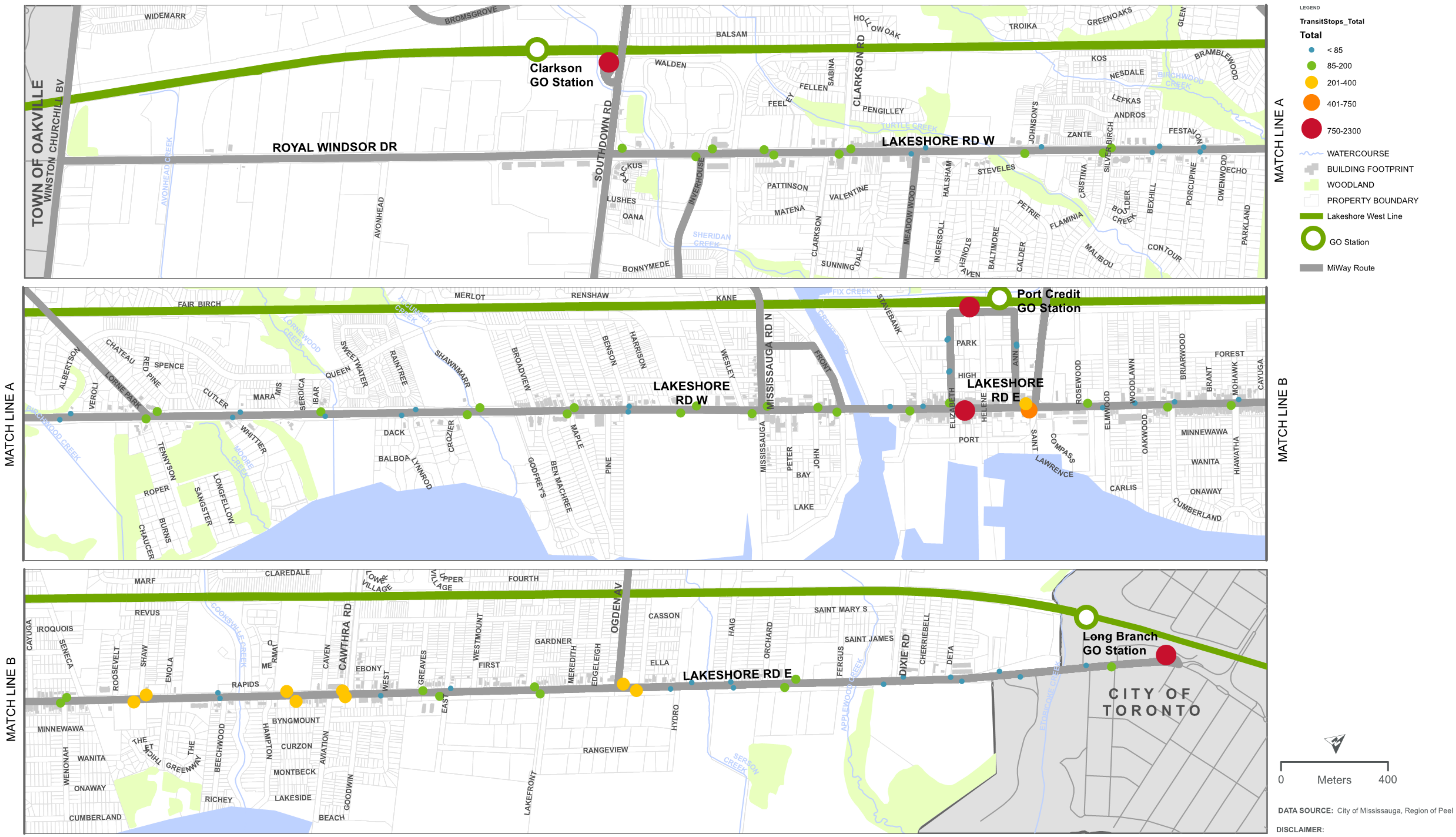


Exhibit 3-34: Total Daily Boarding and Alighting (Route 23)

3.5.3 Transit Quality of Service

The following sections described the quality of transit service within the Study Corridor, including: frequency, service span, access, passenger load, travel time, and reliability.

FREQUENCY & SERVICE SPAN

Frequency of transit or the time between successive buses is a key factor in influencing overall trip satisfaction. The shorter the wait time between buses the greater the flexibility that customers have in selecting travel times. Service span determined the potential markets that transit serves, and is defined by the number of hours during the day when service is available. The frequencies of buses along route 23 are listed in **Table 3-8**.

Table 3-8: Route 23 Frequency by Time Period and Direction

Period	Frequency	Buses per Hour
Weekday Peak	15-17	4
Weekday Midday	25	3
Weekday Evening	25	3
Weekday Night	33-35	2
Weekend Morning	26	3
Weekend Midday	26	3
Weekend Evening	26	3

The 23 Lakeshore route operates Monday through Sunday with the following service span:

- Eastbound: the first bus leaves Clarkson GO Station at 4:33 AM and the last bus leaves at 12:40 AM.
- Westbound: the first bus leaves Long Branch GO Station at 4:54 AM and the last bus leaves at 1:20 AM.

Weekday GO trains on the Lakeshore West Line have a frequency of 30 minutes or better between 5 AM and 10 PM eastbound from Aldershot and between approximately 6 AM and midnight westbound from Union Station.

All routes listed in **Table 3-5** operate on Saturdays with the exception of routes 14 and 14A. On Sundays, all routes except for 8, 14, 14A and express route 103 operate within the Study Corridor.

Headways are greater than 15 minutes on average even during peak periods for both MiWay and GO Transit routes which can be categorized as “long-headway” arrivals where passengers can be expected to schedule their arrivals at transit stops. Long-headways provide a reduced quality of service compared to “short-headway” arrivals (i.e. less than 10 minutes) since passengers typically budget extra time into their trip to ensure they actually catch their desired transit departure and provides less flexibility in leaving home or work. The service span on route 23 and the Lakeshore West GO Line is long enough to allow additional types of trips to be served other than the traditional commute trips and midday trips.

PASSENGER LOAD

Transit is less attractive when passengers cannot readily find an available space on a bus or train and when vehicles are crowded. MiWay operates 40 foot long buses on route 23 with a seated capacity of 37 persons and a standing capacity of 55 persons. The load at the busiest point along the route during the AM peak period is 208 passengers and the maximum load during the PM peak period is 316 passengers.

Although MiWay does not have formalized loading standards the values listed in **Table 3-9** are used to determine capacity constraints.

Table 3-9: Loading Standards[1]

Bus	Loading Standard
30 foot	35 passengers
40 foot	50 passengers
60 foot	85 passengers

[1]Informal MiWay standards to be used as a guideline only

With 4 buses per hour during peak periods the approximate capacity of route 23 is 200 peak direction passengers per hour. The peak direction passengers per hour at the busiest point along the route are calculated in **Table 3-10** which shows that the bus is operating at approximately 50% of capacity.

Table 3-10: Peak direction passengers per hour

Direction	Peak Hour Ridership	Peak Period Ridership	Peak Hour Factor	Maximum Line Load	Peak Hour Line Load
Eastbound (AM)	197	425	197/425 =0.46	208	208*0.46 =96
Westbound (WB)	243	781	243/781 =0.31	316	316x0.31 =98

ACCESS

A key factor in choosing to use transit and an indicator of the quality of the service is whether or not the transit service provides a reasonable walking distance to one's origin and destination. Based on Transportation Research Board's (TRB) Transit Cooperative Highway Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual (TCQSM), 3rd Edition, the typical distance a passenger will walk to access a bus stop is approximately 400 metres or less with an average walking speed of 5 kilometres per hour (i.e. 5 minutes). Several other factors influence the access distance to transit including: the pedestrian environment, street patterns, accessibility, bicycle access, and automobile access/park-and-ride facilities.

Exhibit 3-35 illustrates a 400 metre (5 minute) walking distance from each bus stop serving route 23. There are approximately 18,500 people and 4,434 jobs within walking distance to an existing bus stop.

Exhibit 3-35: Transit Walk Shed (400 metre or 5 minute walking distance)

TRAVEL TIME

Route 23 (Lakeshore) travels along Lakeshore Road between Clarkson GO, Port Credit GO, and Long Branch GO Stations making 52 stops in the westbound direction and 50 stops in the eastbound direction over approximately 13 kilometres. Busses have an average speed of 22 kilometres per hour on a typical weekday. The average daily duration for a bus to travel from terminal to terminal is 35 minutes in the eastbound direction and 33 minutes in the westbound direction.

The total travel time between terminals by departure time of the trip is illustrated in **Exhibit 3-36** and **Exhibit 3-37** for the eastbound and westbound directions, respectively. Travel time data is collected by the City of Mississauga and reported for select stops along a route. Total travel times in the eastbound direction generally range between 30 and 40 minutes. The total travel time peaks during the AM and PM peak periods as expected with travel times of 40 and 38 minutes respectively. Higher travel times in the AM peak period are consistent with higher vehicular traffic volumes also travelling in this direction (i.e. Oakville to Toronto).

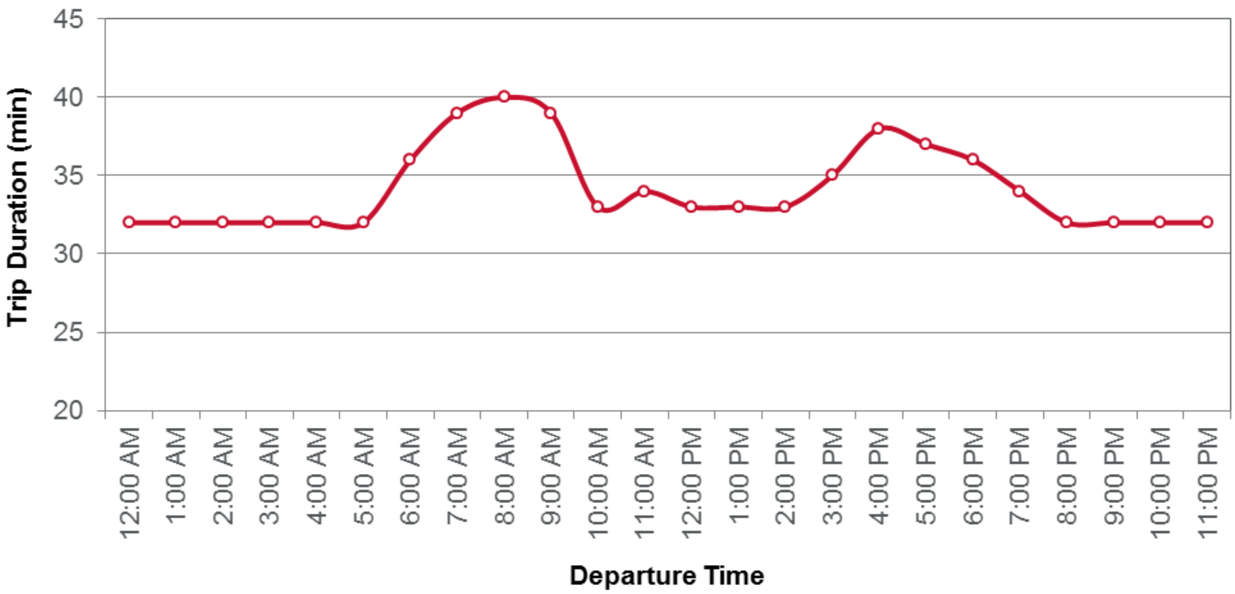


Exhibit 3-36: Total Travel Time by Time of Departure (Eastbound)

Total travel times in the westbound direction are also generally between 30 and 40 minutes. Travel times in the westbound direction follow a similar pattern to the eastbound direction and peaks are observed between approximately 8 – 9 AM, and 3 PM. Longer travel times between 12 AM and 5 AM is attributed to longer dwell times at Port Credit GO Station to connect with last GO Transit trips. Total travel times in the westbound direction are generally less than those in the eastbound direction. Higher travel times in the PM peak periods is consistent with higher vehicular traffic volumes also travelling in this direction (i.e. Toronto to Oakville).

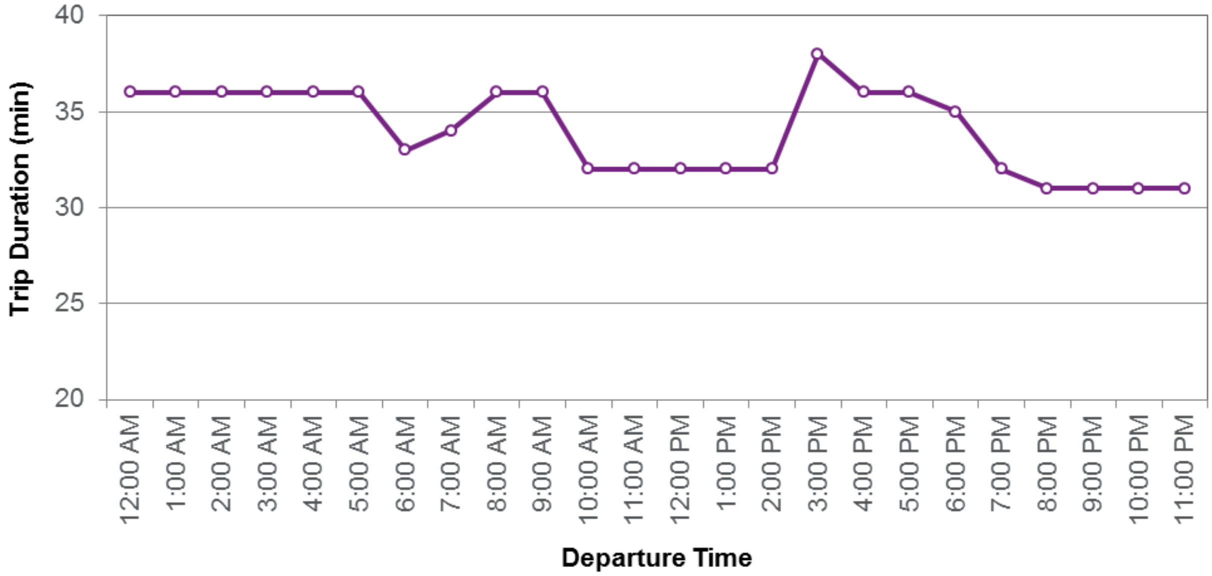


Exhibit 3-37: Total Travel Time by Time of Departure (Westbound)

The average weekday travel times between timed bus stops on route 23 are shown in **Exhibit 3-38**. Travel time between these timed stops is generally between 3 to 6 minutes.

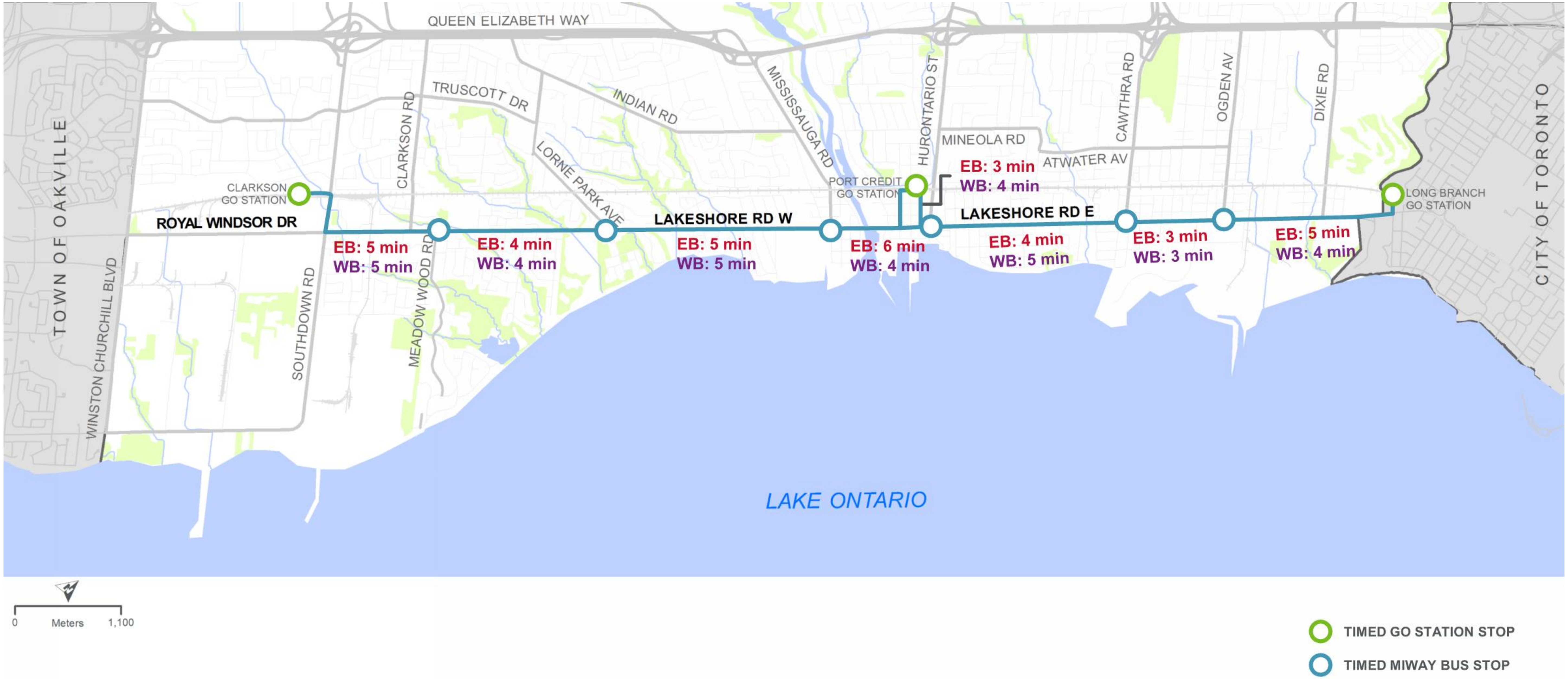


Exhibit 3-38: Average Weekday Transit Travel Time (Route 23)

RELIABILITY

Traffic congestion along Lakeshore Road is predictable (i.e. does not vary widely) and bus schedules are able to factor in this added delay; therefore, buses run on time. In less congested sections on Lakeshore Road, buses tend to run ahead of schedule due to low boarding/alighting at stops in these sections.

Buses operate slowly between Mississauga Road and Cawthra Road and between Ogden Avenue and Dixie Road due to typical congestion in these sections. Service is most reliable in the off-peak hours. MiWay has noted that buses experience reliability issues due to difficulty in making left turns from Lakeshore Road to Ann Street in order to access Port Credit GO Station. MiWay also noted potential safety concerns at this intersection as well.

To improve reliability MiWay is performing bus stop rationalization along Lakeshore Road and the City of Mississauga is also replacing and upgrading traffic signals for transit signal priority for the future.

3.6 Motorized Vehicles

The following section describes the existing network, demand and level of service with respect to motorized vehicles within the Study Corridor, Network Analysis Area, and Strategic Analysis Area.

3.6.1 Road Network

The road network within the Strategic Analysis Area is illustrated in **Exhibit 3-39** and includes the Provincial, Regional, and Local roads listed in **Table 3-11.**

Table 3-11: Road Network Classification

Classification	Jurisdiction	Name
Controlled Access Freeway	MTO	• Queen Elizabeth Way (QEW)
Regional Road	Peel Region	• Winston Churchill Boulevard • Cawthra Road • Dixie Road
Local Road – Major	City of Mississauga	• Lakeshore Road • Royal Windsor Drive • Mississauga Road • Hurontario Street • Southdown Road • Ogden Avenue • Indian Road • Truscott Drive • Mineola Road • Atwater Avenue • Lorne Park Road

A detailed account of the Study Corridor roadway characteristics is provided in **Section 3.1.**

Exhibit 3-39: Existing Road Network

3.6.2 Vehicular Demand

PEAK HOUR VOLUMES

As illustrated in **Exhibit 3-40**, existing traffic on Lakeshore Road is highest in the eastbound direction during the weekday AM peak hour and generally ranges between 1,000 and 2,000 vehicles per hour with a 2,500 vehicle per hour spike at Mississauga Road.

In the weekday PM peak, as shown in **Exhibit 3-41,** traffic is highest in the westbound direction and generally ranges between 1,000 and 1,500 vehicles per hour, with a 2,000 vehicle per hour spike at Cawthra Road.

In both peaks, the off-peak direction traffic flow is much lower than the peak direction, indicating that Lakeshore Road serves a commuter function. The lowest volumes are observed at the east and west ends of the Study Corridor indicating that the intra-Mississauga traffic role of Lakeshore Road is more significant than its inter-regional role.

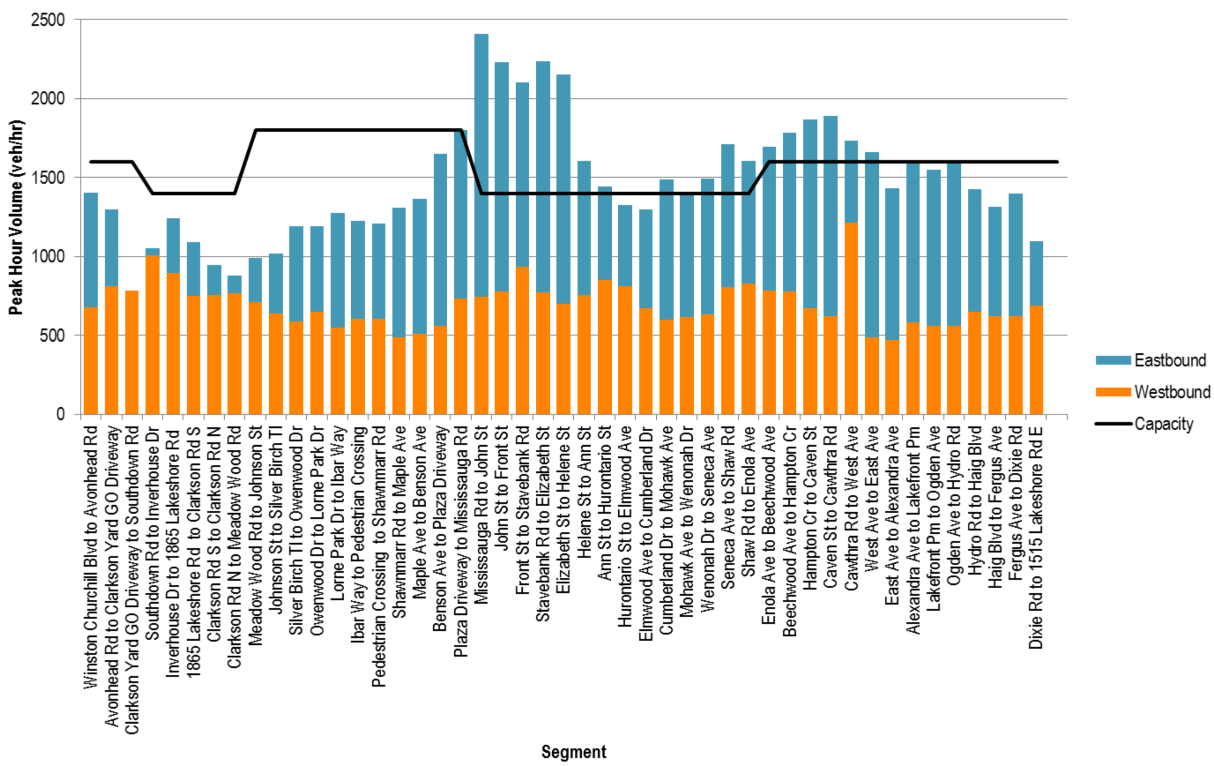


Exhibit 3-40: AM Peak Hour Volumes – Lakeshore Road (2016)

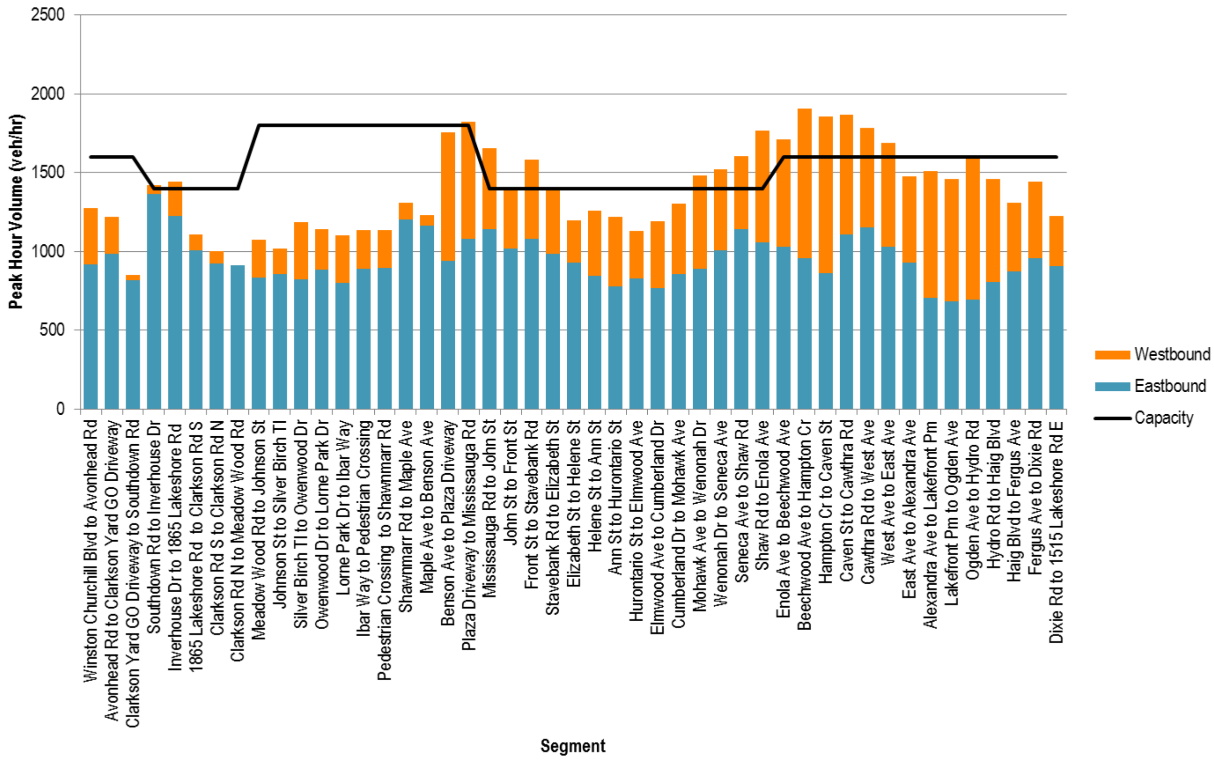


Exhibit 3-41: PM Peak Hour Volumes – Lakeshore Road (2016)

24 HOUR DAILY TRAFFIC VOLUMES

Conventional traffic planning uses peak direction peak hour traffic volumes to assess existing and future capacity and operational issues. The conventional approach often neglects the off-peak hours and fails to analyze the utilization of roadway capacity throughout the course of a day. **Exhibit 3-42** and **Exhibit 3-43** present the 24 hour volume-to-capacity (V/C) ratios at eight select locations along Lakeshore Road and illustrate the variation in demand compared to the available theoretical capacity over a 24 hour period.

As illustrated in **Exhibit 3-42,** much of Lakeshore Road is underutilized (i.e. V/C ratio less than 0.85) in the westbound direction throughout the day with the exception of the PM peak period (i.e. 3-7 PM) within the Port Credit Area (i.e. Stavebank Road to Hurontario Street).

A similar pattern is observed in the eastbound direction as shown in **Exhibit 3-43,** where much of Lakeshore Road is underutilized throughout the day with the exception of the AM peak period (6-9 AM) within the Port Credit Area (i.e. Stavebank Road to Hurontario Street).

Lakeshore Road - WESTBOUND

Start Time	Winston Churchill Blvd	Southdown Rd	Lorne Park Rd	Wesley Ave	Stavebank Rd	Hurontario St	Greaves Ave	Etobicoke Creek
0:00	0.04	0.04	0.04	0.07	0.11	0.08	0.06	0.07
1:00	0.03	0.02	0.03	0.03	0.06	0.04	0.03	0.05
2:00	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.03
3:00	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.03
4:00	0.04	0.04	0.01	0.01	0.02	0.02	0.02	0.03
5:00	0.09	0.11	0.03	0.03	0.06	0.06	0.05	0.06
6:00	0.22	0.31	0.09	0.10	0.17	0.16	0.12	0.14
7:00	0.44	0.52	0.21	0.23	0.39	0.38	0.25	0.26
8:00	0.52	0.61	0.31	0.38	0.71	0.57	0.37	0.35
9:00	0.43	0.50	0.32	0.38	0.60	0.50	0.34	0.29
10:00	0.41	0.45	0.29	0.37	0.57	0.45	0.32	0.28
11:00	0.48	0.51	0.32	0.39	0.59	0.51	0.37	0.31
12:00	0.55	0.56	0.34	0.43	0.64	0.61	0.40	0.36
13:00	0.52	0.56	0.37	0.47	0.71	0.61	0.42	0.36
14:00	0.58	0.60	0.38	0.48	0.74	0.65	0.43	0.40
15:00	0.61	0.61	0.44	0.59	0.99	0.85	0.64	0.67
16:00	0.70	0.71	0.57	0.71	1.11	0.88	0.75	0.84
17:00	0.81	0.73	0.57	0.74	1.14	0.89	0.70	0.87
18:00	0.72	0.63	0.50	0.56	0.86	0.75	0.54	0.63
19:00	0.44	0.42	0.31	0.42	0.67	0.60	0.39	0.40
20:00	0.28	0.29	0.26	0.36	0.52	0.47	0.35	0.32
21:00	0.23	0.21	0.19	0.28	0.45	0.38	0.27	0.23
22:00	0.18	0.17	0.14	0.19	0.31	0.26	0.19	0.19
23:00	0.11	0.10	0.11	0.16	0.25	0.22	0.16	0.16

Exhibit 3-42: 24 Hour Volume-to-Capacity Ratio (Lakeshore Road Westbound)

Lakeshore Road - EASTBOUND

Start Time	Winston Churchill Blvd	Southdown Rd	Lorne Park Rd	Wesley Ave	Stavebank Rd	Hurontario St	Greaves Ave	Etobicoke Creek
0:00	0.05	0.06	0.04	0.04	0.07	0.06	0.04	0.05
1:00	0.03	0.03	0.02	0.02	0.03	0.03	0.03	0.03
2:00	0.03	0.02	0.01	0.01	0.03	0.03	0.02	0.03
3:00	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02
4:00	0.05	0.04	0.01	0.03	0.03	0.03	0.03	0.02
5:00	0.12	0.09	0.05	0.09	0.09	0.07	0.10	0.09
6:00	0.35	0.26	0.21	0.33	0.46	0.35	0.36	0.28
7:00	0.69	0.48	0.47	0.67	1.05	0.74	0.67	0.51
8:00	0.64	0.48	0.50	0.69	1.08	0.88	0.64	0.58
9:00	0.43	0.37	0.35	0.46	0.73	0.56	0.50	0.39
10:00	0.42	0.39	0.29	0.39	0.60	0.50	0.41	0.32
11:00	0.43	0.40	0.33	0.43	0.65	0.49	0.36	0.29
12:00	0.53	0.46	0.35	0.46	0.66	0.53	0.37	0.30
13:00	0.49	0.44	0.34	0.43	0.64	0.52	0.40	0.30
14:00	0.53	0.45	0.36	0.45	0.66	0.57	0.40	0.31
15:00	0.54	0.51	0.37	0.46	0.73	0.63	0.44	0.39
16:00	0.69	0.62	0.48	0.56	0.81	0.65	0.52	0.49
17:00	0.86	0.67	0.58	0.58	0.79	0.73	0.57	0.58
18:00	0.62	0.60	0.57	0.54	0.85	0.79	0.62	0.60
19:00	0.36	0.35	0.36	0.47	0.74	0.63	0.46	0.42
20:00	0.25	0.27	0.22	0.31	0.54	0.43	0.31	0.28
21:00	0.21	0.21	0.19	0.25	0.41	0.32	0.25	0.26
22:00	0.16	0.15	0.11	0.15	0.25	0.24	0.18	0.18
23:00	0.09	0.09	0.08	0.11	0.19	0.16	0.12	0.13

Exhibit 3-43: 24 Hour Volume-to-Capacity Ratio (Lakeshore Road Eastbound)

EAST-WEST SCREENLINE ANALYSIS

An analysis of east-west transportation links within the broader study area, between Dundas Street, Lake Ontario, the east City limit, and the west City limit was performed to assess existing travel demands and capacities. Cordon counts were extracted from the 2011 Cordon Count Program which is maintained by the Data Management Group (DMG) at the University of Toronto. Four screenlines were used to assess east-west travel demand and capacity in the broader study area as follows:

- Peel-Halton Boundary represented by Winston Churchill Boulevard (west City limit)
- Credit River
- Hurontario Street
- Etobicoke Creek (east City limit)

Each screenline intersects with several road links and each of these links has a certain capacity which represents the number of vehicles that it can accommodate over time. The capacity is determined by the speed, the number of lanes and the function of the road. As traffic increases on a road link, the speed deteriorates and the traffic volume becomes unstable and potentially congested.

The screenline analysis that was performed compares the traffic volume across the screenline to the available capacity which is provided on each road link that intersects with the screenline. In order to determine the level of service of the screenline the volume to capacity (v/c) ratio is used. For v/c links and screenlines with a v/c ratio less than 0.9, it can be said that the link or screenline is not congested. A v/c ratio between 0.9 and 1.0 indicated that the link or screenline is approaching capacity and is congested. For links with a v/c ratio greater than 1.0 the link or screenline is over capacity and is also congested.

The existing AM and PM peak hour east-west travel screenline volume-to-capacity assessment is shown in **Exhibit 3-44** and **Exhibit 3-45**, respectively.

The existing road network within the broader study area is experiencing capacity constraints in the east-west direction during both the AM and PM weekday peak periods. During the AM peak hour (**Exhibit 3-44**), the Credit River, Hurontario, and Etobicoke Creek screenlines are congested in the eastbound direction. During the PM peak hour (**Exhibit 3-45**), the Credit River screenline is congested in both directions while the Etobicoke Creek screenline is congested in the westbound direction.

The road segments that are congested or above capacity are highlighted in yellow and red in **Exhibit 3-44** and **Exhibit 3-45** respectively, they include:

- QEW between Winston Churchill Boulevard and Highway 427 in both directions during both the AM and PM peak hours.
- Dundas Street at the Credit River, Cawthra Road and Dixie Road in the AM and PM peak hours in the peak directions.
- Queensway at Cawthra Road and Dixie Road in the AM and PM peak hours in the peak directions.
- Lakeshore Road at the Credit River and at the Etobicoke Creek in the AM and PM peak hours in the peak directions.

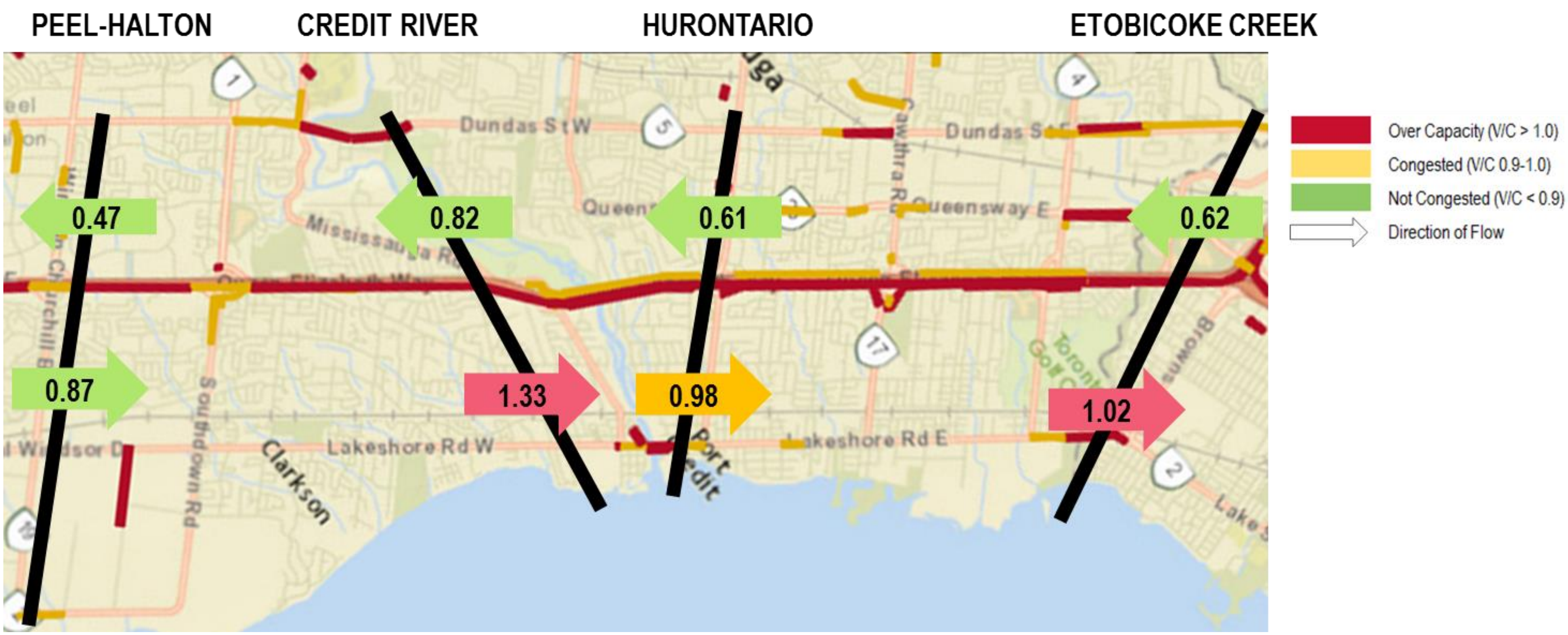


Exhibit 3-44: Existing AM Peak Hour, East-West Travel Screenline Volume/Capacity Assessment

Exhibit 3-45: Existing PM Peak Hour, East-West Travel Screenline Volume/Capacity Assessment

GOODS MOVEMENT

Major truck generators within the Strategic Analysis Area are located where high concentrations of businesses generate a significant number of truck trips such as manufacturing, wholesale, and transportation and warehousing businesses. As shown in **Exhibit 3-46**, there is a high concentration of these businesses within the Southdown and Lakeview Character Areas. Secondary truck trip generators include professional, scientific and technical services and retail businesses and are generally served by light to medium vehicles compared to heavy vehicles serving the manufacturing, wholesale, and transportation and warehousing businesses.

Heavy trucks are restricted from Regional Roads within the Strategic Analysis Area as listed in **Table 3-12**.

Table 3-12: Regional Road Heavy Truck Restriction (2015)

Street	Limits	Restriction
Winston Churchill Boulevard	A point located 240 metres north of Royal Windsor Drive (North limit of Canadian National Railway) to the south limit of South Sheridan Way	11:00 PM to 7:00 AM
Winston Churchill Boulevard	Lakeshore Road East to Beryl Road	11:00 PM to 7:00 AM
Cawthra Road	Lakeshore Road East to Highway 403 Ramp	7:00 PM to 7:00 AM

Exhibit 3-47 illustrates the truck volumes along the Study Corridor during the AM, midday, and PM peak hours. The highest truck volumes are observed at the Southdown Road/Lakeshore Road and Ogden Avenue/Lakeshore Road intersections consistent with high concentration of manufacturing, wholesale, and transportation and warehousing businesses at these locations. Truck volumes are relatively consistent throughout the rest of the Study Corridor generally ranging between 50 – 175 vehicles during one of the three peak hours.

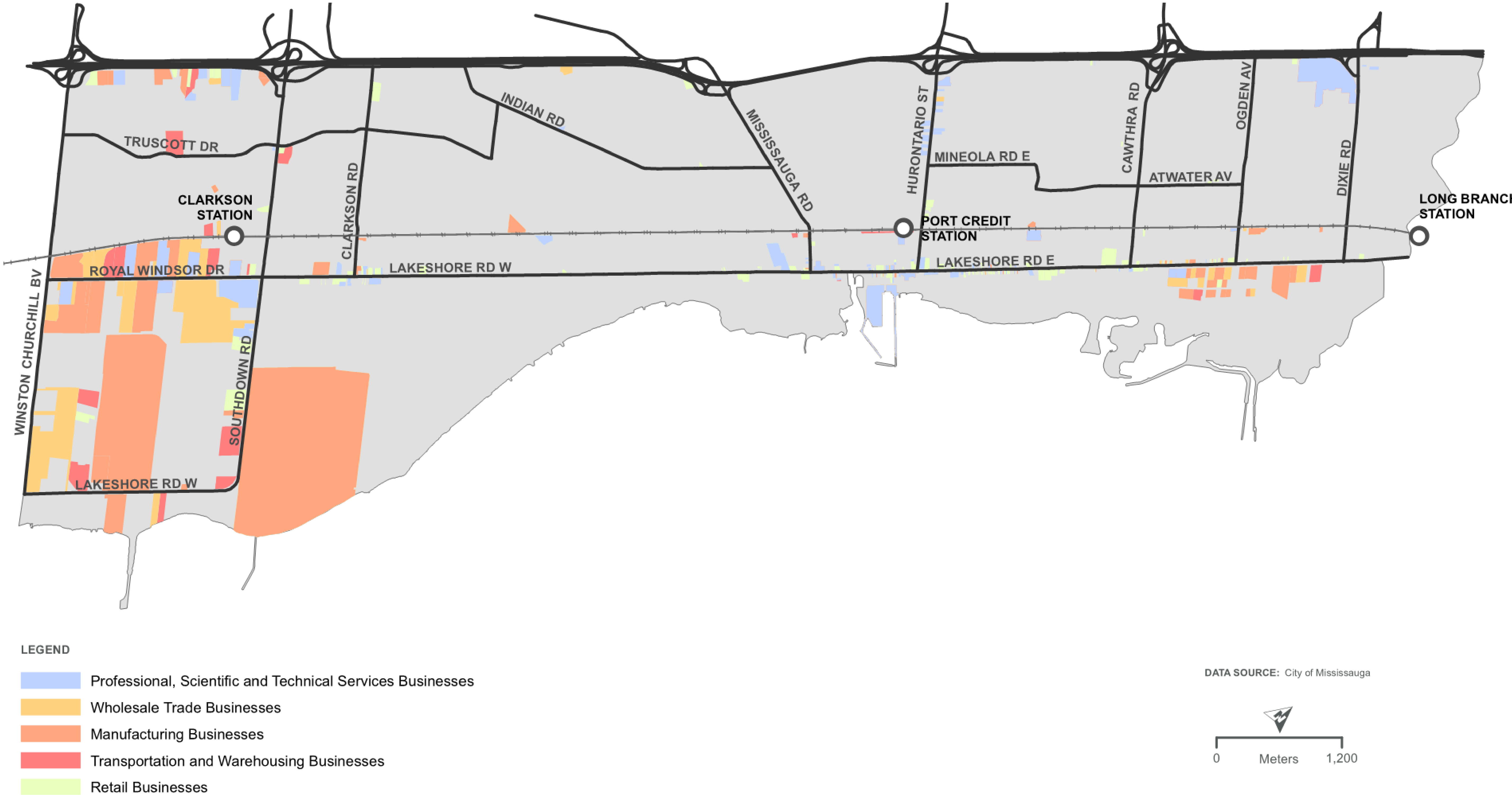


Exhibit 3-46: Employment Areas by Type of Business

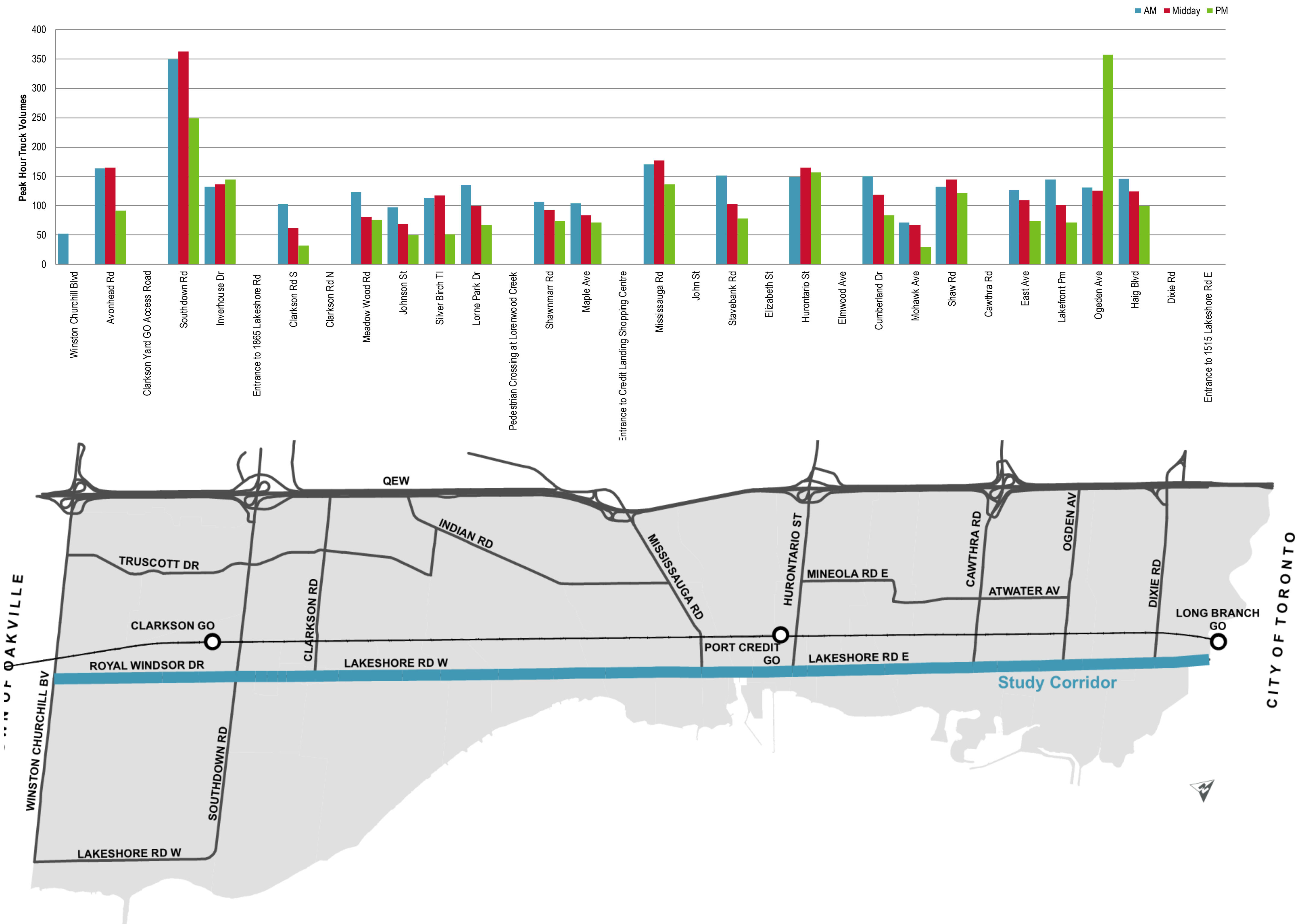


Exhibit 3-47: Peak Hour Truck Volumes

3.6.3 Vehicular Level of Service

TURNING MOVEMENT COUNT DATA

This section describes the existing traffic operations at signalized intersections along the Study Corridor. Existing operations for 31 signalized intersections were analyzed - 29 of which are on Lakeshore Road and two are on Hurontario Street to the immediate north of Lakeshore Road. These intersections were analyzed to provide a complete understanding of the existing traffic operations along and within the vicinity of the Study Corridor.

The focus of this analysis is the operations of signalized intersections along the Study Corridor; however, several unsignalized intersections and three pedestrian signals have also been assessed in using Synchro for both the AM and PM peak hours. The operations at these intersection are acceptable and do not present any critical conditions; therefore, the results have been excluded from the analysis for brevity.

The existing traffic condition analysis was conducted based on the most recent turning movement counts available and provided by the City of Mississauga and the Region of Peel. For intersections where counts were not available or were deemed too old to reflect the existing condition, HDR conducted counts during March of 2016. Additionally, the Port Credit GO Station Master Plan was sourced for the counts of two intersections on Hurontario Street (High Street and Park Street). Therefore, as shown in **Table 3-13**, there is some variability in the turning movement counts in terms of count year and month. As the count years range from 2012 to 2015, link volume may vary from one intersection to the next. Since peak hour traffic volumes were used in the analysis, the peak hour at each intersection varies as well, which also results in link volume imbalances.

Due to the aforementioned reasons, volume balancing was performed between intersections where imbalance cannot be explained by traffic coming in and out of driveways and unsignalized local intersections in-between. Volume balancing was intended to develop a representative existing traffic condition. Only through movement traffic volumes along Lakeshore Road were adjusted (i.e. no adjustments were made to turning movement volumes or north-south approach volumes). The balanced volumes were carried forward to be the base of operation analysis.

Table 3-13: Turning Movement Count Details

Corridor	Intersecting Roadway	Date of Count (YY/MM/DD)
Lakeshore Road	Dixie Road	2015/09/16
Lakeshore Road	Haig Boulevard	2014/11/11
Lakeshore Road	Ogden Avenue	2012/09/11
Lakeshore Road	Lakefront Promenade	2012/09/18
Lakeshore Road	East Avenue	2013/10/30
Lakeshore Road	Cawthra Road	2015/12/01
Lakeshore Road	Shaw Road	2012/09/05
Lakeshore Road	Mohawk Avenue	2012/10/31
Lakeshore Road	Cumberland Drive	2014/12/04
Lakeshore Road	Elmwood Avenue	2016/03/09
Lakeshore Road	Hurontario Street	2016/03/09
Lakeshore Road	Elizabeth Street	2016/03/09
Lakeshore Road	Stavebank Road	2012/11/27
Lakeshore Road	John Street	2016/03/09
Lakeshore Road	Mississauga Road	2012/11/21
Lakeshore Road	Entrance to Credit Landing Shopping Centre	2016/03/09
Lakeshore Road	Maple Avenue	2015/06/24
Lakeshore Road	Shawnmarr Road	2015/06/18
Lakeshore Road	Lorne Park Drive	2012/11/28
Lakeshore Road	Silver Birch Trail	2012/12/04
Lakeshore Road	Meadow Wood Road	2012/12/12
Lakeshore Road	Clarkson Road N	2016/03/10
Lakeshore Road	Clarkson Road S	2012/12/11
Lakeshore Road	Entrance to 1865 Lakeshore Road	2016/03/10
Lakeshore Road	Inverhouse Drive	2012/12/05
Lakeshore Road	Southdown Road	2015/06/17
Royal Windsor Drive	Clarkson Yard GO Access Road	2016/03/10
Royal Windsor Drive	Avonhead Road	2012/02/02
Royal Windsor Drive	Winston Churchill Boulevard	2013/06/04
Hurontario Street	High Street	2015/04/01
Hurontario Street	Park Street	2015/04/01

METHODOLOGY

Existing intersection operations were assessed for the signalized intersections along the corridor, applying methodology consistent with the *Region of Peel Regional Guidelines for Using Synchro Version 7.73 Revision 8, December 2010.*

The analysis was conducted using the software program *Synchro, Traffic Signal Coordination Software Version 7, Build 7.73, Rev 8*, which employs the *Highway Capacity Manual (HCM 2000)* methodology published by the Transportation Research Board National Research Council. Synchro can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections.

The signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume to capacity ratio (v/c); and
- The level of service (LOS) for all intersection movements, which is based on the average control delay per vehicle for each of various movements through the intersection, and for the overall intersection.

Level of service is based on the average control delay per vehicle for a given movement. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between 'A' and 'F', with 'F' being the longest delay. The volume to capacity (v/c) ratio is a measure of the degree of capacity utilized at an intersection.

HCM delays and corresponding letter grades are shown below in **Table 3-14**.

Table 3-14: Signalized Intersection Level of Service (HCM 2000)

Level of Service (LOS)	Control Delay per Vehicle (s)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Note: LOS derived from HCM 2000

Note: Generally LOS A, B, and C are considered acceptable. LOS D indicates that delays are more perceptible. LOS E and F indicate notable delays but may be acceptable in urban contexts. They also indicate areas where transit priority measures will have the largest relative benefit for transit travel time reductions.

INTERSECTION LEVEL OF SERVICE

The existing traffic operations for weekday AM and PM peak hours were assessed for all signalized intersections along the Study Corridor.

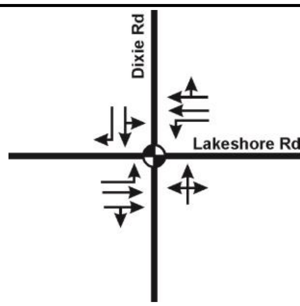
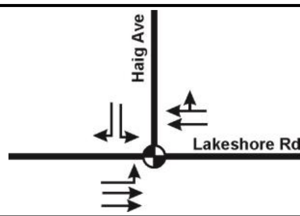
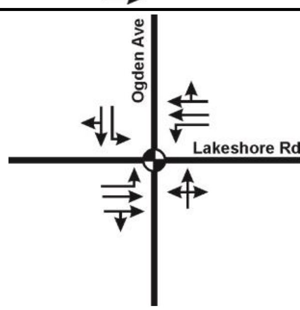
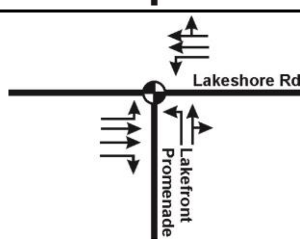
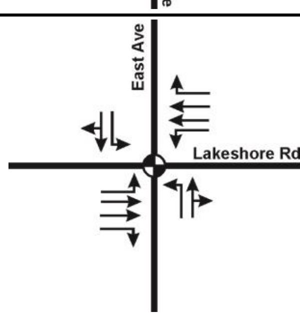
The existing traffic operations are shown in **Table 3-16**, including a schematic of the lane configuration, and the overall intersection level of service. Movements operating poorly are also listed for each intersection. As per the *Region of Peel Traffic Impact Study Terms of Reference*, through or shared-through movements operating with volume to capacity ratios of 0.90 or above, and exclusive turning movements with volume to capacity ratios of 1.0 or above, are indicated. We have also indicated any movements operating with excessive delays (LOS ‘F’) based on the scale shown in **Table 3-14**.

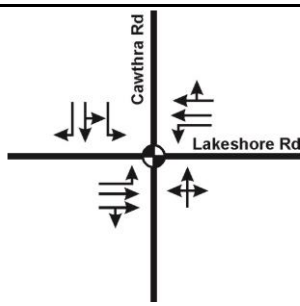
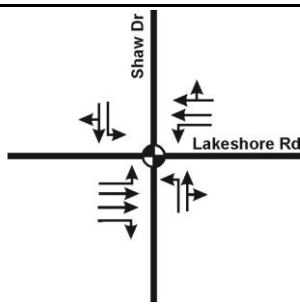
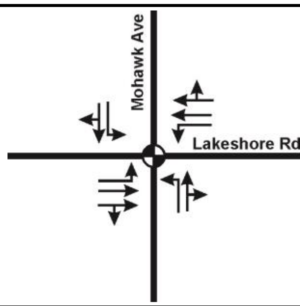
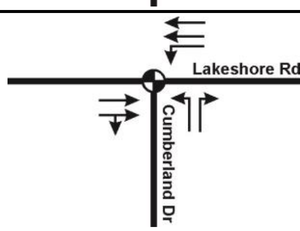
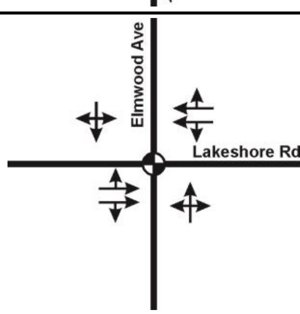
A legend for the lane configuration schematic is shown in **Table 3-15**. Detailed Synchro reports (HCM 2000 and queues) are provided in **Appendix C**.

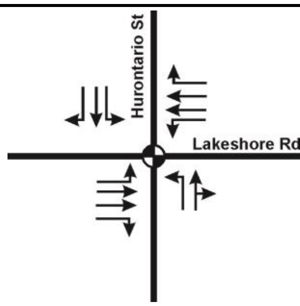
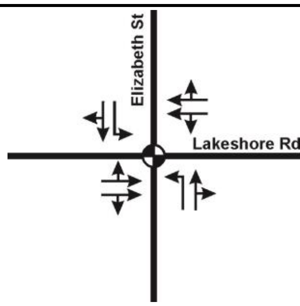
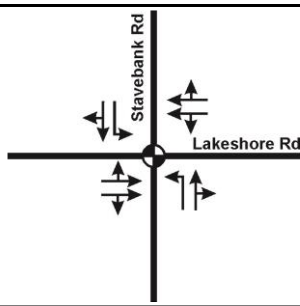
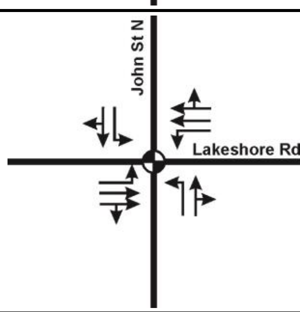
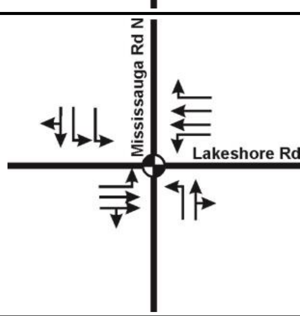
Table 3-15: Legend for Intersection Lane Configuration Schematic

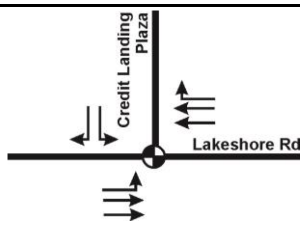
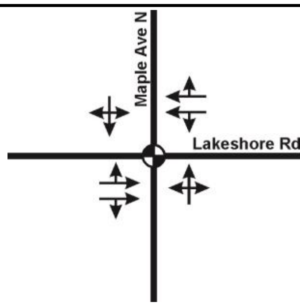
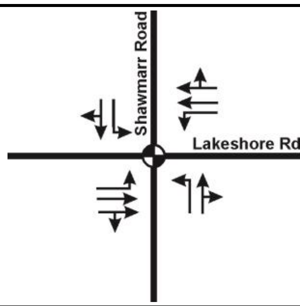
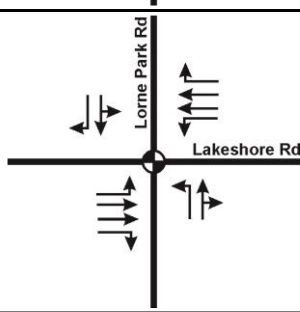
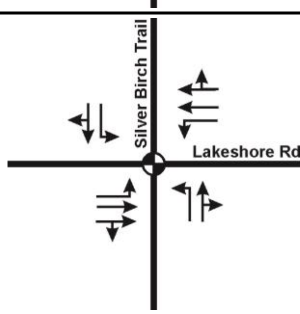
Movement	**Symbol**
Traffic Signal	
Left-Turn Lane	
Share Thru-Left Lane	
Thru Lane	
Shared Thru-Right Lane	
Shared Left-Through-Right Lane	
Right-Turn Lane	
Shared Thru-Right Lane, with Channelized Right	
Channelized Right-Turn Lane	
All schematics oriented with north aligned with the top of page	

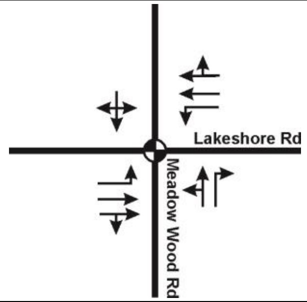
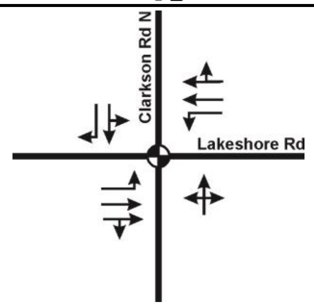
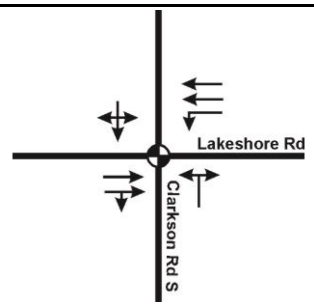
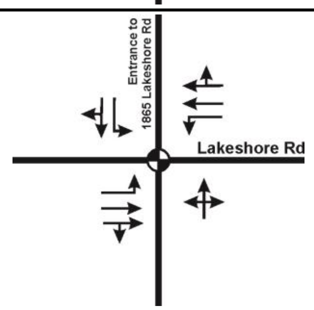
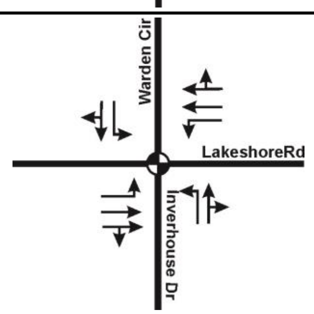
Table 3-16: Existing Intersection Operations (Weekday AM and PM Peak Hours)

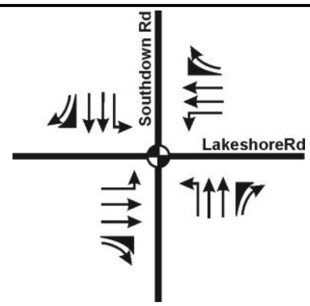
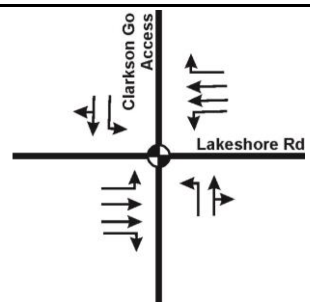
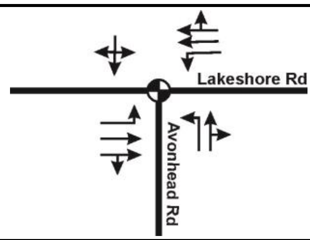
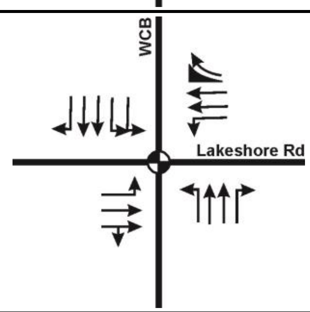
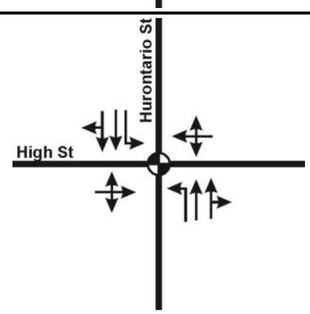
Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Dixie Road		B		C	
Haig Avenue		A		A	
Ogden Avenue		B		A	
Lakefront Promenade		A		A	
East Avenue		A		A	

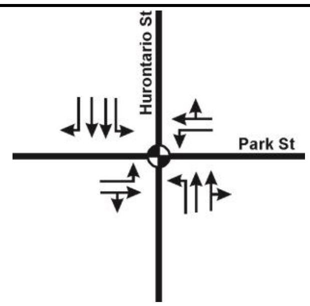
Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Cawthra Road		**B**		**B**	
Shaw Drive		**A**		**A**	
Mohawk Avenue		**A**		**A**	
Cumberland Drive		**A**		**A**	
Elmwood Avenue		**A**		**A**	

Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Hurontario Street		B		C	
Elizabeth Street		A		A	
Stavebank Road		B		B	EBLTR – 0.93, C
John Street		A		A	
Mississauga Road		D	EBT – 0.98, D	C	

Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	**Movement v/c and LOS**	**Overall LOS**	**Movement v/c and LOS**
Credit Landing Plaza Access		A		A	
Maple Avenue		A		A	
Shawnmarr Road		A		A	
Lorne Park Road		B		B	
Silver Birch Trail		B		A	

Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Meadow Wood Road		B		A	
Clarkson Road North		B		B	
Clarkson Road South		B		B	SBLTR – 0.91, F
Entrance to 1865 Lakeshore Road		A		A	
Inverhouse Drive		B		B	

Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Southdown Road		D	NBL – 0.96, F	D	WBR – 0.28, F
Clarkson GO Access		A		C	NBL – 1.00, F
Avonhead Road		A		A	
Winston Churchill Blvd		C		C	
High Street and Hurontario Street		A		A	

Intersection	Lane Configuration Schematic	AM Peak Hour		PM Peak Hour	
		Overall LOS	Movement v/c and LOS	Overall LOS	Movement v/c and LOS
Park Street and Hurontario Street		**C**	EBL - 0.99, F	**B**	

Existing operations along the Study Corridor are acceptable in terms of both LOS and v/c ratio. No intersection is operating with LOS “F” or at capacity (v/c ratios greater than 1.0).

Specifically, majority of the signalized intersections on Lakeshore Road (27 out of 29) are operating with overall level of service A, B, or C, during both the weekday AM and PM peak hours.

Among these 27 intersections, **no movements** at these intersections are operating with v/c ratios higher than 0.9 or worse than LOS ‘E’, despite the two exceptions below:

- Clarkson Road South/Lakeshore Road: The southbound approach (driveway out of Tim Hortons) during the weekday PM peak hour. The southbound left-through-right turn movement is operating with v/c ratio 0.92 and LOS ‘F’;
- Clarkson GO Access Road/Royal Windsor Drive: The northbound approach during the weekday PM peak hour. The northbound left turn movement is operating with v/c ratio of 1.00 and LOS ‘F’. Note that analysis has been conservative at this intersection – the v/c ratio and LOS could be better in reality if the northbound left turn motorists chose to turn concurrently with the southbound right turn vehicles.

Two intersections are operating with an **overall intersection** LOS D during either the AM or the PM peak hour as listed below:

- Mississauga Road/Lakeshore Road: during the PM peak hour is operating with overall LOS ‘D’ and the critical movement is eastbound through with v/c ratio of 0.98 and LOS ‘D’.
- Southdown Road/Lakeshore Road: during both AM and PM peak hours is operating with LOS ‘D’.

- Critical movement during AM Peak hour is the northbound left turn movement with v/c ratio of 0.96 and LOS ‘F’
- Critical movement during PM Peak hour is the westbound right turn movement with v/c ratio of 0.28 and LOS ‘F’

The two intersections on Hurontario Street are operating with overall LOS of C or better during both the AM and PM peak hours. Only the eastbound left turn at Park Street during the AM peak hour is experiencing LOS ‘F’ with v/c ratio of 0.95.

In general, the Study Corridor is operating with excess capacity to accommodate existing vehicle volumes.

3.6.4 Vehicular Travel Times

Travel time surveys were conducted along the Study Corridor during the peak hours (AM and PM), the off-peak hour (Midday), and in each direction (eastbound and westbound) to determine average travel times between major intersections, identify potential locations of excessive delay/congestion, and document average speed profiles.

Exhibit 3-48 and **Exhibit 3-49** present the cumulative travel time between major intersections for each of the peak hours in the eastbound and westbound directions respectively. The average total travel time in the eastbound direction is 17 minutes for the AM, PM and Midday peak hours. The average total travel time in the westbound direction is 17 minutes in the AM and Midday peak hours and 18 minutes in the PM peak hour – consistent with peak direction travel. Free flow travel time is approximately 16 minutes and an average stopped delay of 1 to 2 minutes is experienced for the entire corridor. The average travel time per segment and overall travel time among the three peak hours is constant, incidcating that peak hour peak direction congestion is not affecting travel time reliablility in the corridor and regardless of time, travel between major intersections is relatively stable and free flow with minimal delay.

The average speed along the Study Corridor is approximately 50 km/hr; however, speed varries significantly along the Study Corridor ranging between 16 to 76 km/hr. For example, the Port Credit Community node is generally characterized by greater pedestrian volumes, and on-street parking where the average speed drops to its minimum. Where as areas such as Southdown, Lorne Park, and Lakeview experience higher speeds (over the speed limit) where there are greater setbacks from the road, less pedestrian activity, and adbsense of on-street parking. Speed profiles for the AM, Mid-day, and PM peak hours are presented in **Exhibit 3-50**, **Exhibit 3-51**, and **Exhibit 3-52** respectively.

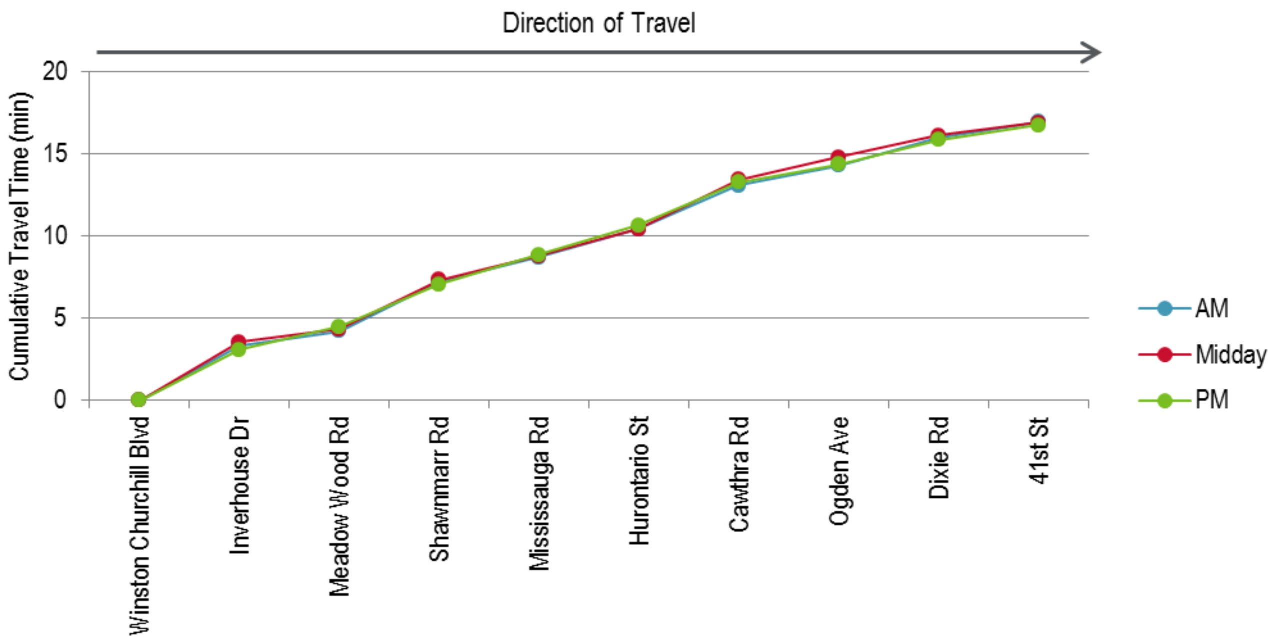


Exhibit 3-48: Average Weekday Peak Hour Travel Times (Eastbound)

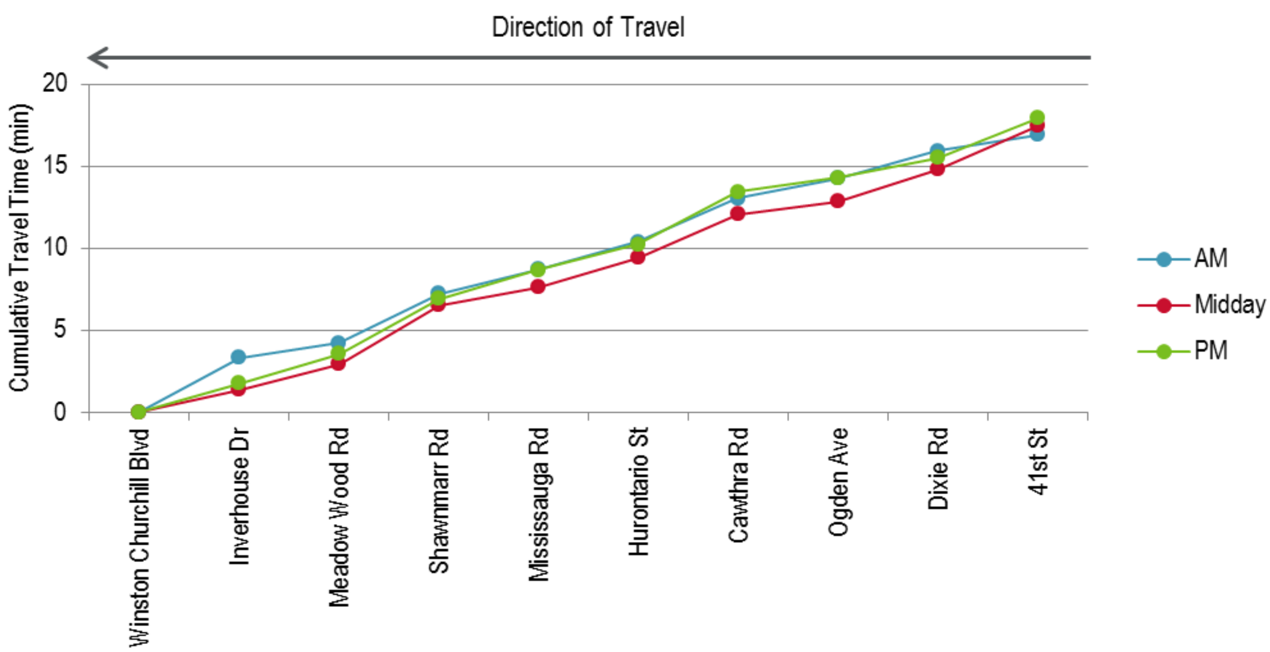


Exhibit 3-49: Average Weekday Peak Hour Travel Times (Westbound)

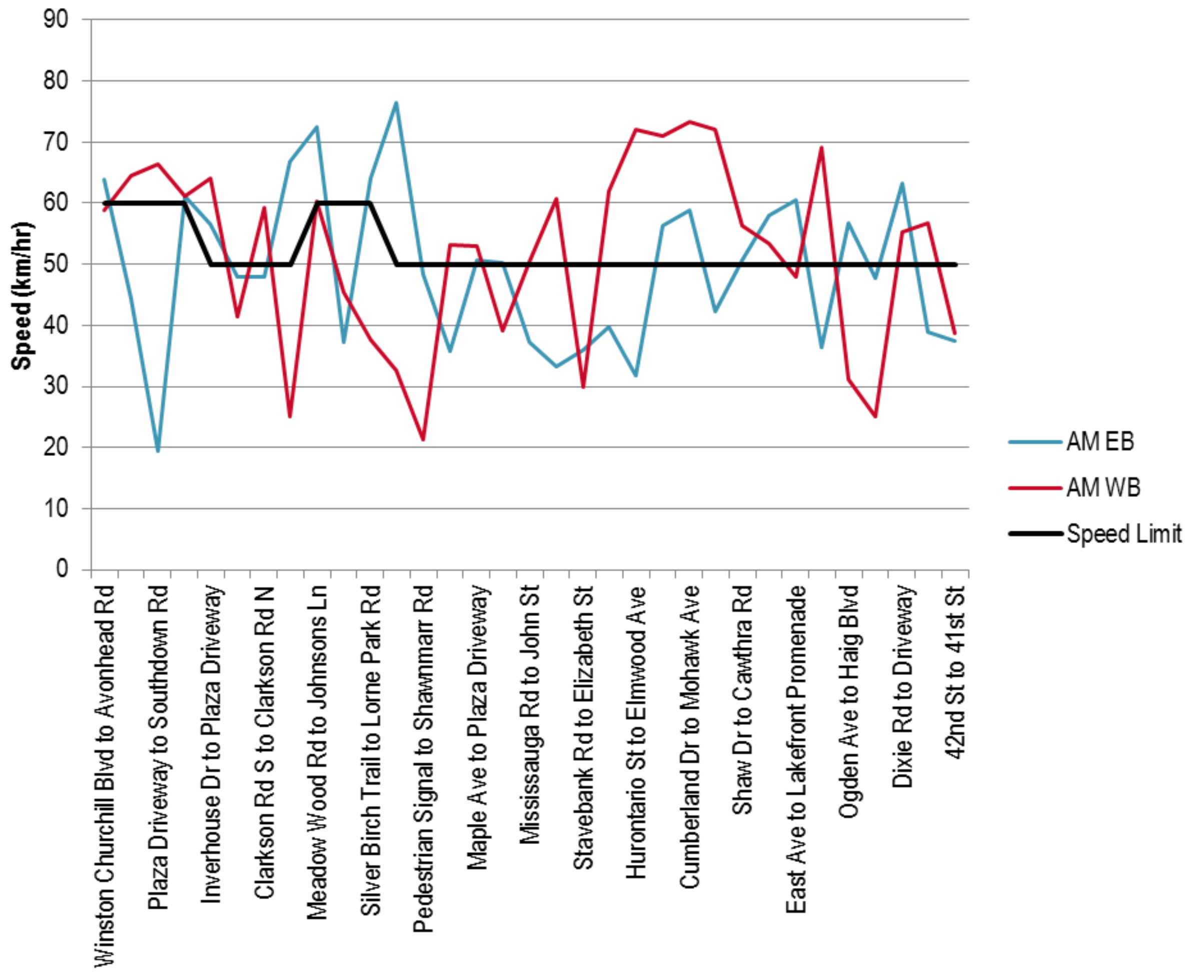


Exhibit 3-50: Average AM Peak Hour Speed Profile

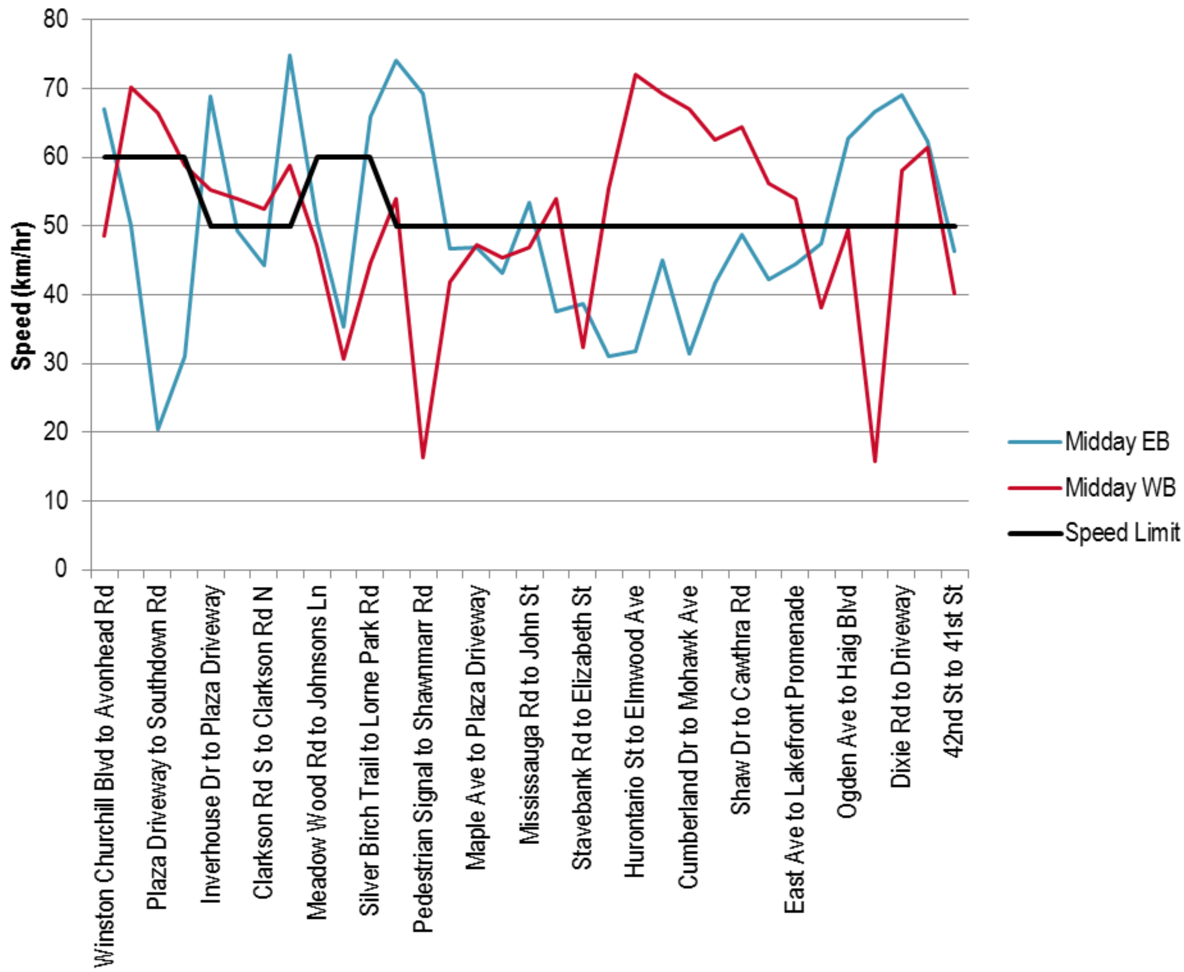


Exhibit 3-51: Average Mid-day Peak Hour Speed Profile

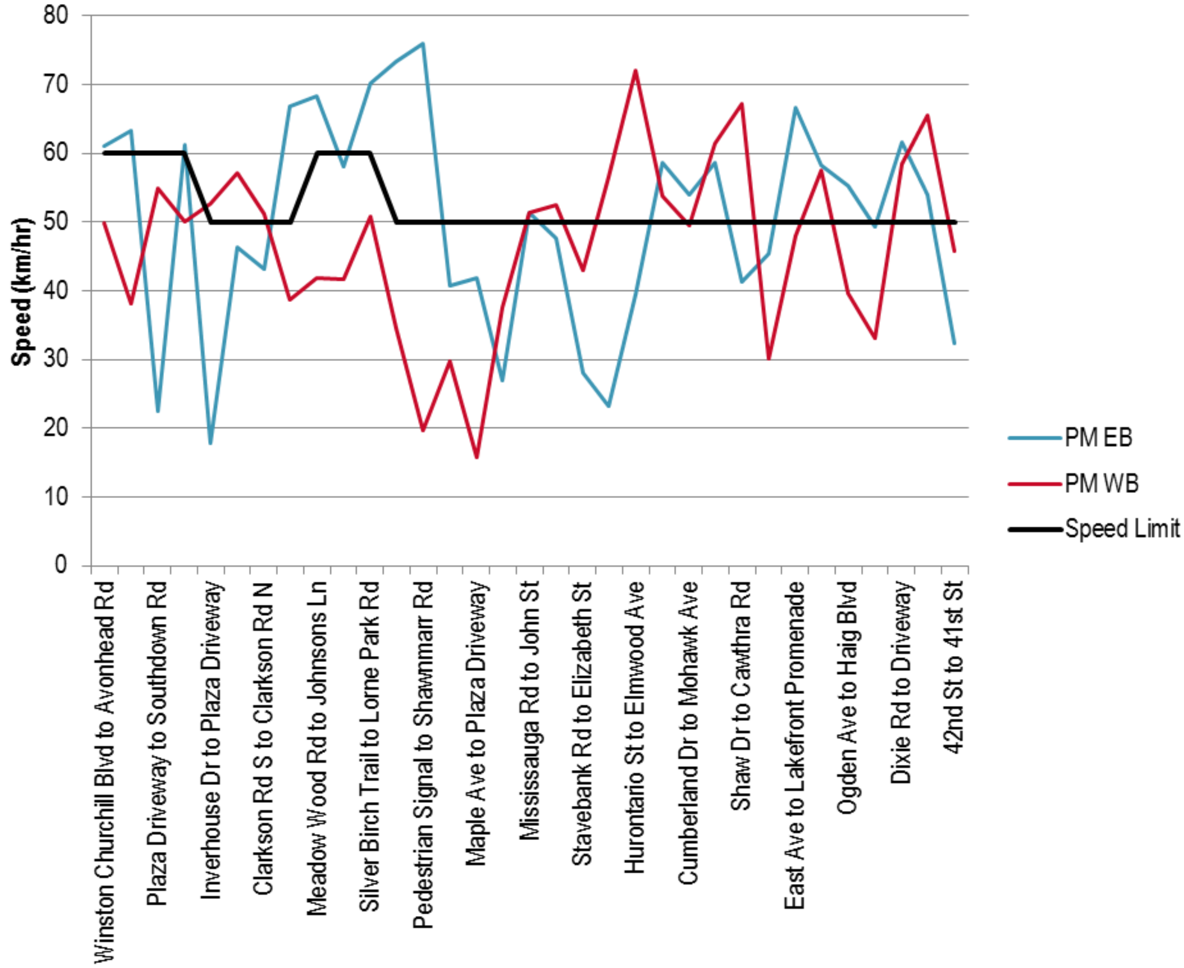


Exhibit 3-52: Average PM Peak Hour Speed Profile

3.7 Safety

A safety assessment and collision review was completed for the Study Corridor. The analysis is based on City of Mississauga provided intersection-related collision records for the years between 2009 and 2013 along the Lakeshore study corridor. Collisions reported with classification of 'Non-reportable' are assumed to be 'Property Damage Only' (PDO), as more severe collisions resulting in injury would be classified as such. The full safety assessment is provided in **Appendix D**.

There were 904 collisions reported between 2009 and 2013 in the Study Corridor; 743 (82%) were classified as PDO, 159 (18%) non-fatal injury, and 2 (0.2%) fatal injury collisions. The majority of collisions occurred in eastbound and westbound directions which are consistent with the traffic patterns on Lakeshore Road.

There are only 3 intersections within the study corridor that were included in the Region's network screening analysis; potential for safety improvement (PSI) and ranks for other intersections are not available. The intersection with the highest PSI ranking is Lakeshore Road at Winston Churchill Boulevard. The intersection with the highest collision rate is Southdown Road and Lakeshore Road.

The location at which collisions occurred is relatively distributed along the study corridor, with the exception of Southdown Road which experienced the highest number of collisions occurred within the review period:

- Southdown Road and Lakeshore Road
    - 142 collisions: 118 PDO and 24 Non-fatal injury
    - Predominant impact type: rear-end

In addition, three other locations had a moderate number of collisions, including:

- Stavebank Road and Lakeshore Road (73 collisions)
    - 73 collisions: 65 PDO and 8 Non-fatal injury
    - Predominant impact type: sideswipe
- Mississauga Road and Lakeshore Road (70 collisions)
    - 70 collisions: 58 PDO and 12 Non-fatal injury
    - Predominant impact type: rear-end
- Hurontario Street/St Lawrence Drive and Lakeshore Road (68 collisions)
    - 68 collisions: 56 PDO and 11 Non-fatal injury
    - Predominant impact type: rear-end

There are opportunities for reducing high rear-end collisions throughout the Study Corridor. The typical casual factor for this impact type is close traffic gaps during peak hour periods.

Hurontario Street and Southdown Road also had the highest number of vulnerable-users related collisions (9 and 6 collisions respectively). Consideration of active transportation facilities and road characteristics such as bike lanes, sidewalks, and buffer width should be examined closely in future project phases at these two locations.

Lastly, there were two fatal collisions that occurred on Lakeshore Road during the analysis period, at Alexandra Ave in 2011 and Briarwood Ave in 2010. The incident at Briarwood Avenue involved an eastbound vehicle colliding with a pedestrian that resulted in a fatality. There was only one recorded vulnerable-user related collision at this location during the five year period and no other similar types of collisions were observed.

3.8 Summary of Multi-Modal Transportation Conditions

The existing quality of service for pedestrians, cyclists, transit, and motorized vehicles was analyzed in **Section 3** to provide a multi-modal perspective of the study area and assist in informing the future stages of this study. The key findings of the existing transportation conditions analysis is summarized as follows:

i. **ROW Characteristics:** Along the Study Corridor, the ROW narrows to 26 - 31 metres at several locations and presents challenges for future improvements, the limits of these bottlenecks are as follows: Etobicoke Creek to Dixie Road, Haig Boulevard to Hydro Road (Power distribution easement), Greaves Avenue to Godfrey's Lane (majority of Port Credit area), and Meadow Wood Road to Clarkson Road South (Clarkson Village Community Node).

ii. **Travel Demand:** There is a high propensity to travel by car within the Strategic Analysis Area which is indicative of a primarily auto-oriented, low-density area in close proximity to a major freeway with free parking at regional rail stations. Of all trips made to or from the Strategic Analysis Area, approximately half are to/from other parts of the City of Mississauga and the City of Toronto, while 23% remain internal to the Study Corridor. Existing travel patterns indicate that it is equally important for trip makers within the Strategic Analysis Area to access the rest of Mississauga as it is the City of Toronto by transit. There is a high proportion of short trips (less than 1 kilometre) made by those driving alone which implies that walking and cycling are not attractive alternative modes for these trips.

iii. **Pedestrians:** The Study Corridor generally provides a satisfactory pedestrian quality of service with continuous sidewalks along the majority of the corridor.

However, improvements can be made to increase the buffer between motorized traffic and pedestrians and improve intersection treatments.

iv. **Cyclists:** Cycling facilities along the corridor are neither continuous nor contiguous and several gaps are present where cyclists do not have a dedicated space within the ROW allocated for them. The gaps are located between the following segments: Winston Churchill Boulevard to Southdown Road, Godfrey's Lane to Hydro Road, and Dixie Road to the east City limit. The bicycling quality of service is generally poor throughout the corridor due to lack of dedicated space for cycling, and high traffic volumes and speeds which make cycling less appealing. Improvements can be made to provide continuous, dedicated and/or separated cycling facilities along the entire length of the Study Corridor.

v. **Transit:** Route 23 along Lakeshore Road is an important east-west transit connection in the City of Mississauga and serves three GO Stations and connects to important TTC routes at Long Branch. Transit activity is concentrated around the Clarkson, Port Credit, and Long Branch GO Station platforms as well as the intersections of Lakeshore Road/Elizabeth Street and Lakeshore Road/Hurontario Street. Other locations with high transit activity include Lakeshore Road/Cawthra Road and Lakeshore Road/Ogden Avenue. Route 23 (Lakeshore) has a healthy total daily ridership of 4404 persons with an average daily total route travel time of 33-35 minutes. MiWay has progressively eliminated bus bays where possible in favour of on-street stops and existing bus bays do not currently accommodate MiWay's sixty-foot buses. Route 23 is generally reliable and operates with few operational issues except for turning movements from Lakeshore Road onto Elizabeth Street and Ann Street to access the Port Credit GO Station.

vi. **Traffic Operations:** Existing operations along the Study Corridor are acceptable in terms of both LOS and v/c ratio. No intersection is operating with LOS "F" or at capacity (v/c ratios greater than 1.0). In general, the Study Corridor is operating with excess capacity to accommodate existing vehicle volumes.

vii. **Safety:** The intersection with the highest PSI ranking is Lakeshore Road at Winston Churchill Boulevard. The intersection with the highest collision rate is Southdown Road and Lakeshore Road. There are opportunities for reducing high rear-end collisions throughout the Study Corridor. Hurontario Street and Southdown Road also had the highest number of vulnerable-users related collisions (9 and 6 collisions respectively). Consideration of active transportation facilities such as bike lanes, sidewalks, and buffer width should be examined closely in future project phases at these two locations.

4 Cultural/Heritage Resources

A desktop-level cultural resource (archaeology and heritage) survey for the Study Corridor was prepared and is provided in **Appendix E**. The survey is not intended to act as a Stage 1 Archaeological Assessment as identified in the Ontario Ministry of Tourism, Culture, and Sport's 2011 Standards and Guidelines for Consultant Archaeologists, nor does it fulfill the requirements of a Heritage Impact Assessment.

This heritage resource survey does not include a detailed assessment of registered archaeological sites, individual heritage properties, or detailed property histories. Once the TMP has been created and the development areas have been identified, further archaeological and cultural heritage assessments will be required on all subject properties with the potential to be disturbed through construction activities.

Along the Study Corridor, there are 47 recognized heritage properties, of which nine are individually designated under Part IV of the Ontario Heritage Act (OHA) and seven are designated under Part V as part of Port Credit Village Heritage Conservation District. The remaining 31 properties are listed by the City and subject to the Provincial Policy Statement (PPS) 2014 and planning policies of the City of Mississauga. In addition, the City has identified three cultural heritage landscapes that cross the study corridor (Credit River, Etobicoke Creek, and Mississauga Road), whose unique heritage characteristics will need to be considered in the development process.

There are 21 currently registered archaeological sites that fall within 1km of the Study Corridor. Of those, only one site, on the western bank of the Credit River, is within 100m of the Study Corridor.

The approximate locations of known archaeological sites within 1km of the Study Corridor are presented in **Exhibit 4-1**and designated heritage properties and heritage conservation districts within or adjacent to the Study Corridor are shown in **Exhibit 4-2**.

This resource survey is an inventory of the known and identified cultural heritage resources along the Study Corridor. Prior to construction activities taking place, this survey recommends the following:

1. A stage 1 archaeological assessment to determine whether the potential exists for as-yet unidentified archaeological sites within the proposed development areas and to assess the potential for development impacts to any of the registered sites listed in this survey.
2. A Heritage Impact Assessment to determine the impacts to any known or potential cultural heritage resources through the proposed development as required by the PPS, 2014, and the City of Mississauga Official Plan and as described in the City of Mississauga Heritage Impact Assessment Terms of Reference (2015).
3. A Heritage Permit application for any development taking place within or adjacent to Port Credit HCD, as required for compliance with Section 3 of the Old Port Credit Heritage Conservation District Plan.

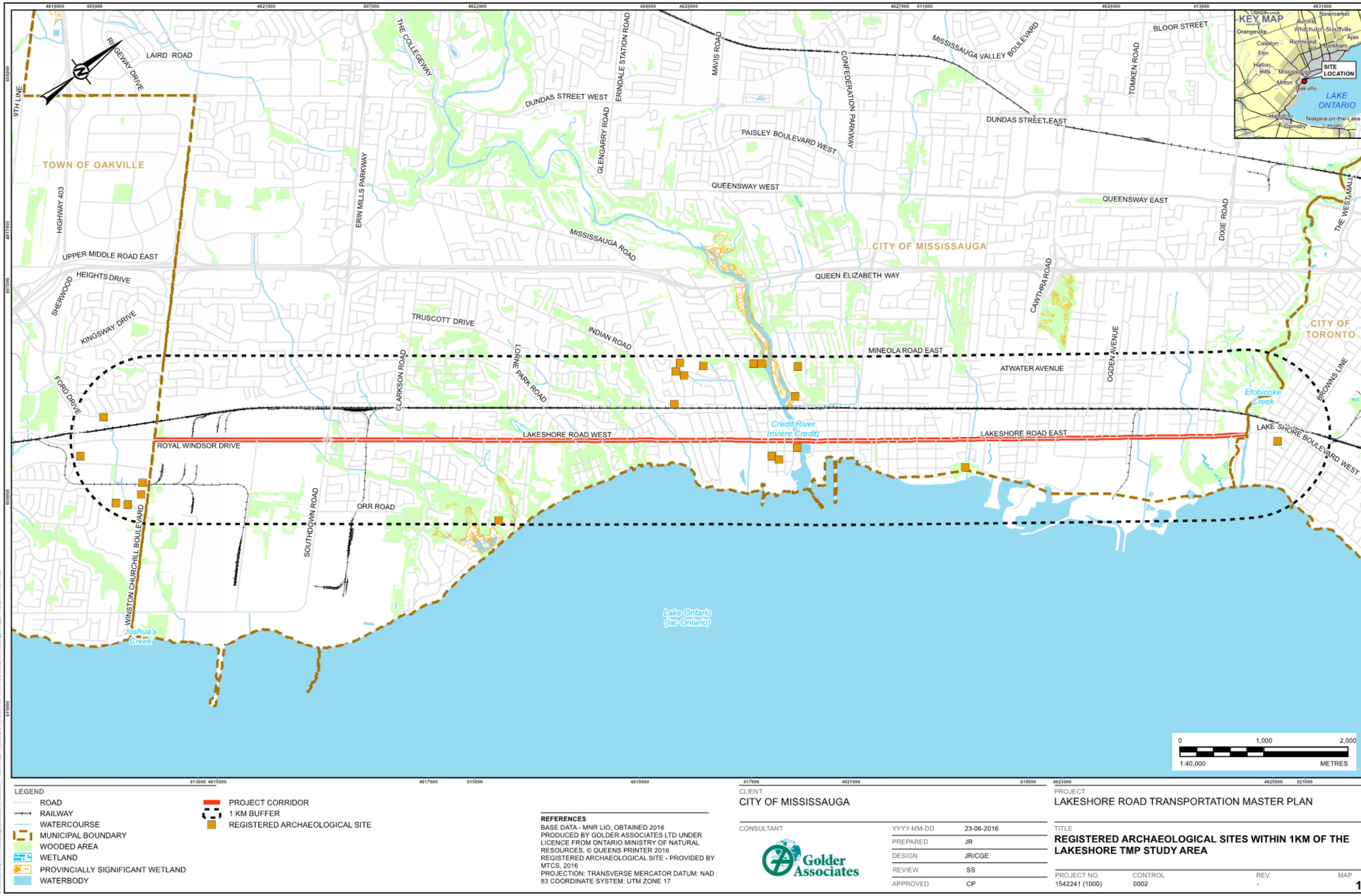


Exhibit 4-1: Registered Archaeological Sites within 1km of the Study Corridor

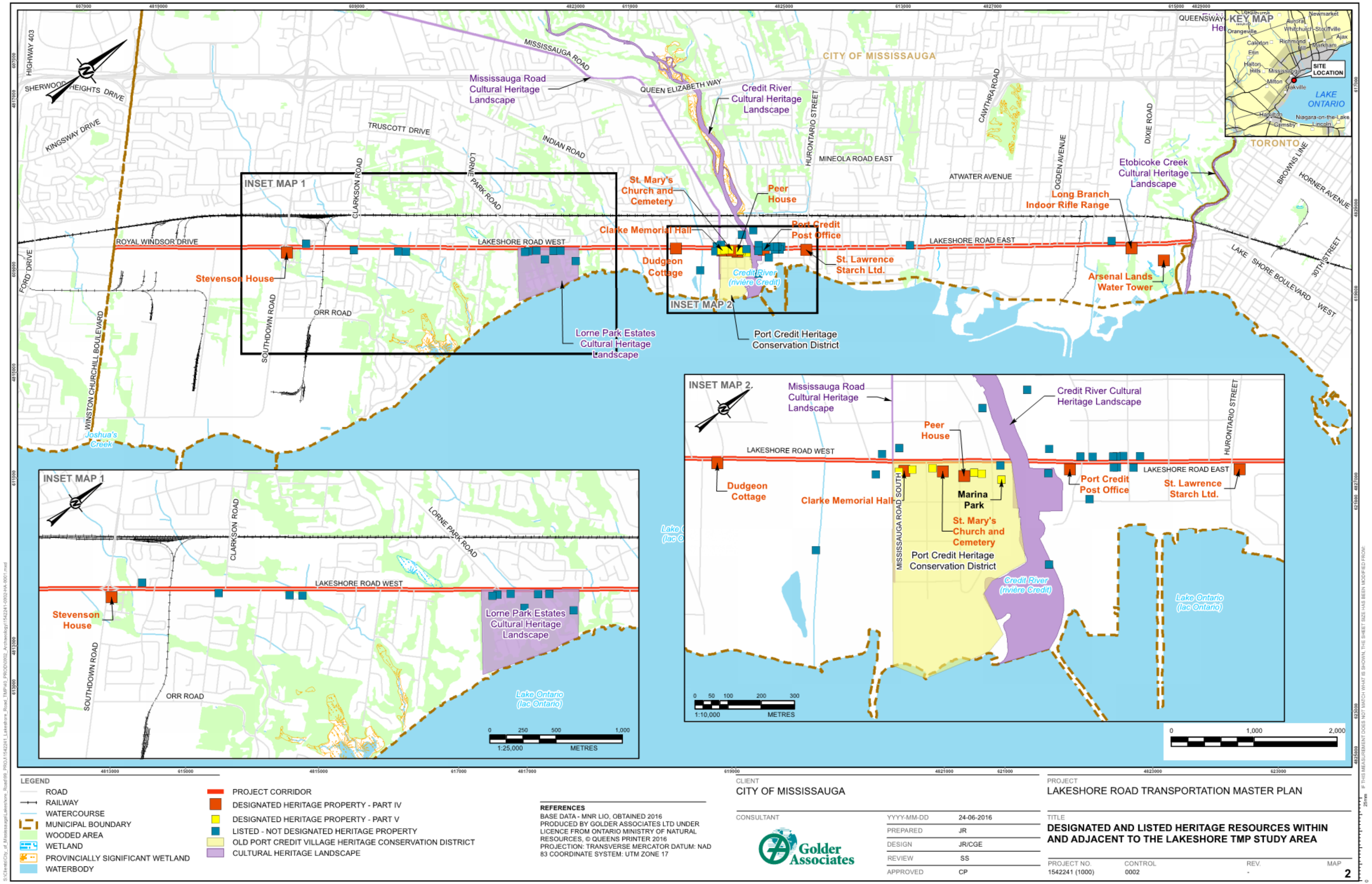


Exhibit 4-2: Designated Heritage Properties and Heritage Conservation Districts within or adjacent to the Study Corridor

5 Natural Environment

A desktop-level review Natural Environment Constraints Assessment is provided in **Appendix F** and was completed to document the existing natural environmental features and potential constraints associated with the Study Corridor and. For the natural environment study a 120 metre buffer on either side of the Study Corridor was used in order to consider effects on adjacent lands. This section documents the findings of the desktop review related to natural areas, wildlife and wildlife habitat, and aquatic features and fish.

5.1 Natural Areas

The natural environment constraint assessment identified natural areas listed in **Table 5-1** and illustrated on **Exhibit 5-1** .

Table 5-1: Natural Areas

Type	Name
Conservation Area	Rattray Marsh Conservation Area located south of the Study Corridor along the shore of Lake Ontario between Bob-O-Link Road and Parkland Avenue.
Areas of Natural and Scientific Interest (ANSI)	• Rattray Marsh Conservation Area (Provincial Life Science ANSI) located approximately 800 m south of the Study Corridor. • Credit River Marshes (Provincial Life Science ANSI) located approximately 400 m north of the Study Corridor.
Significant Valleylands	Significant valleylands are those valleylands associated with tributaries and watercourses that drain directly to Lake Ontario – considered a Significant Natural Area. Core valley and stream corridors associated with the Credit River and Etobicoke Creek
Significant Woodlands	Any woodland grater than 4 hectares in size, and or any woodland that supports provincially or globally rare species, or species designated by COSEWIC or COSSARO as threatened, endangered, or special concern, including: • Residential woodland in Lorne Park Estates • Woodland between Whittier Crescent and Balboa Drive, just west of Lorne Park Estates and south of Lakeshore Road West • Woodland that contains Sheridan Creek, south of Lakeshore Road West, and connects to the Rattray Conservation Area • Woodland north and south of Lakeshore Road West that contains Fudger's Marsh • Woodland that is adjacent to (southwest) Etobicoke Creek

<table>
<tr><th>Type</th><th>Name</th></tr>
<tr><td>Credit Valley Conservation (CVC) Regulation Areas</td><td>Valleylands and riparian habitat of Sheridan Creek, Turtle Creek, Birchwood Creek, Lornewood Creek, Tecumseh Creek, Credit River, Serson Creek, and Applewood Creek.
Parcel of land that contains the multi-use trails that connect to Douglas Kennedy Park and A.E. Cookes Park.
Parcel of land between Birchwood Creek and Parkland Avenue that contains the Jack Darling Memorial Park Trail that contains the multi-use trail from Jack Darling Memorial Park and part of the trail from Rattray Marsh.
The far eastern portion of the Project intersects the Valleylands and riparian habitat of Etobicoke Creek. Not Yet Named Park P-358 is owned by the TRCA and contains Valleylands and riparian habitat on the west bank of Etobicoke Creek.</td></tr>
<tr><td>Toronto and Region Conservation Authority (TRCA) Regulation Areas</td><td>Valleylands and riparian habitat of the Etobicoke Creek.</td></tr>
<tr><td>Region of Peel Official Plan – Natural Areas</td><td>Core Areas of the regional Greenlands System, including: the valleylands and riparian habitat of the Credit River, Sheridan Creek, Turtle Creek, Tecumseh Creek, Lornewood Creek, Birchwood Creek and Etobicoke Creek.</td></tr>
<tr><td>City of Mississauga Official Plan – Natural Areas</td><td>Significant natural areas, linkages, special management areas, and residential woodlands area located within the study area. The location of these specific features is illustrated in Exhibit 5-1.</td></tr>
</table>

5.2 Wildlife and Wildlife Habitat

Based on the desktop assessment, 42 species at risk have been historically observed within 1 kilometre of the Study Corridor and are considered to have high or moderate potential to occur in the study area. Based on the species ranges and habitat requirements, there is moderate or high potential for seven species at risk to occur in the study area as well. The full list is provided in **Appendix F**.

Potential significant wildlife habitats (SWH) present in the study area include, but are not limited to, the following:

- Credit River (movement corridor)
- Etobicoke Creek (movement corridor)
- Fudger's Marsh (habitat for species or special concern)
- Woodlands supporting amphibian breeding ponds (specialized habitat)

5.3 Aquatic Features and Fish

There are several aquatic features in the study area as shown on **Exhibit 5-1,** including: the Credit River, Sheridan Creek, Turtle Creek, Tecumseh Creek, Birchwood Creek, Lornewood Creek, Serson Creek, Applewood Creek, and the Etobicoke Creek as well as some unnamed tributaries.

There are no Provincially Significant Wetlands (PSW) within the study area. The Rattray Marsh and Turtle Creek Reed Swamp are PSWs that are located just south of the study area along the shore of Lake Ontario. The Credit River Marshes and Cawthra Woods are other PSWs located north of the study area.

'Other Wetlands' or wetlands which do not qualify as PSW but are considered significant at a local scale include: the Fudger's Marsh and the wetlands within the valleylands of the Etobicoke Creek.

The Credit River and Etobicoke Creek are considered areas of fish habitat. Within the Credit River watershed, almost 60 species of fish are known to occur, including Northern Pike, White Sucker, Common Shiner, Fathead Minnow, Creek Chub, and Rainbow Darter. Within the study area, watercourses support mainly warmwater and mixed cool/warmwater fish communities. Redside Dace and Shortnose Cisco are known to occur within the Credit River watershed and are designated endangered under the ESA.

The Etobicoke Creek watershed is dominated by warmwater fish communities and supports more than 25 species of fish. The most common include White Sucker, Blacknose Dace, Fathead Minnow, Bluntnose Minnow, and Creek Chub. Many watercourses within this watershed have been channelized as part of flood and erosion control.

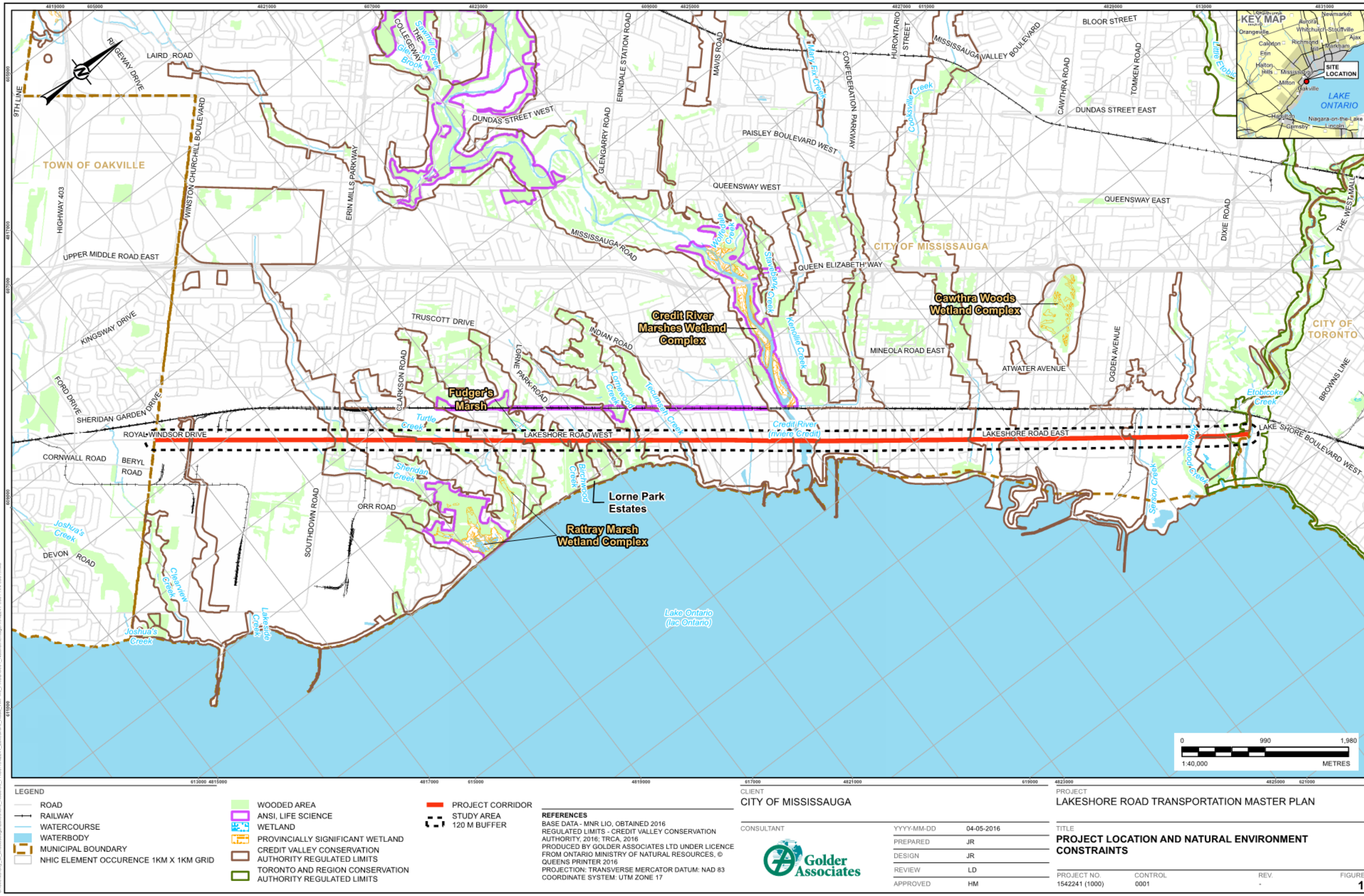


Exhibit 5-1: Location of Natural Environment Constraints

Appendix A

Character Area Summary Chart

hdrinc.com 100 York Boulevard, Suite 300, Richmond Hill, ON, CA L4B 1J8
(289) 695-4600

Appendix B

Existing Typical Cross-sections

hdrinc.com 100 York Boulevard, Suite 300, Richmond Hill, ON, CA L4B 1J8
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Appendix C

Synchro Reports

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Appendix D

Safety Assessment

Appendix E

Cultural Resource Survey

Appendix F

Natural Environment Constraints Assessment

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Appendix A

Character Area Summary Chart

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		Land Use at Grade	Road Cross-Section	Cycling Facilities	Sidewalks	Streets, Blocks & Crossings	User Profile
Character Area 1: Southdown Road Employment Lands	INDUSTRIAL STRIP	▪ 1 to 2-storey industrial / large-scale commercial	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL). ▪ No lay-by or on-street parking ▪ Wide landscaped setbacks, shipping yards, parking lots and auto dealerships	▪ No cycling facilities	▪ No sidewalk on the south side between Winston Churchill Boulevard and Avonhead Road. ▪ Narrow sidewalk adjacent to the curb on south side east of Avonhead Road ▪ Continuous narrow sidewalk adjacent to the curb on the north side ▪ Wide driveways into properties, to accommodate large truck movements	▪ North-south streets intersect Royal Windsor Drive at an average distance of 405 metres ▪ Crosswalks located at signalized intersections at Winston Churchill Boulevard and Avonhead Road, (approx. 1.25 kilometres apart)	▪ Primarily non-local traffic vehicular traffic / commercial transports moving at moderate to high speeds ▪ Low pedestrian and cyclist use
	COMMERCIAL STRIP	▪ 1 to 2-storey commercial ▪ North side strip retail with front parking lots ▪ South side retail complex back-lotted onto Lakeshore Road, with a false frontage along the road	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL). ▪ No lay-by or on-street parking ▪ Front parking lots for the strip commercial properties on the north side of the road	▪ No cycling facilities	▪ East of the Clarkson GO Yard Access Road, the south sidewalk is separated from the road by a grassy boulevard with street trees planted at the back of the sidewalk, along the retail frontage ▪ The driveway into the retail complex on the south side of the road is channelized, as is the intersection at Southdown Road, making east-west pedestrian travel dangerous ▪ There is a narrow sidewalk adjacent to the curb on the north side of the road	▪ North-south streets intersect Royal Windsor Drive at an average distance of 215 metres ▪ Crosswalks located at signalized intersections at Avonhead Road, at the Clarkson GO Yard Access Road (approx. 405 metres apart) and at Southdown Road (approx. 410 metres apart)	▪ Primarily non-local traffic vehicular traffic / commercial transports moving at moderate to high speeds ▪ Low pedestrian and cyclist use
Character Area 2: Clarkson Village Community Node	WEST VILLAGE GATEWAY	▪ 1-3 storey townhouses ▪ Mid-rise towers with large landscaped setbacks ▪ Community park on the north-east corner of Lakeshore Road and Southdown Road	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) and concrete medians at intersections ▪ No lay-by or on-street parking	▪ On-street sharrows	▪ Narrow sidewalk adjacent to the curb along the north side of the road ▪ The south sidewalk has a treed boulevard with furnishing zone ▪ Where the road crosses Sheridan Creek, the north sidewalk maintains a consistent, but narrow width and the south sidewalk transitions to be adjacent to the curb, with a rolled / mountable curb and asphalt curb side zone	▪ North-south streets intersect Lakeshore Road at an average distance of 170 metres ▪ Crosswalks located at signalized intersections at Southdown Road and Walden Circle (approx. 340 metres apart)	▪ Primarily vehicular use ▪ Low pedestrian and cyclist use
	OUTER VILLAGE CORE	▪ 1-3 storey strip commercial / mixed-use with front parking lots ▪ One mid-rise residential tower with landscaped setback near the west edge of the segment	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) ▪ Lay-by parking on the south side of the street	▪ On-street sharrows	▪ Sidewalks are separated from the road by a landscaped and unit paved furnishing zone, including bus shelters, seating and street lighting on both sides of the street ▪ Where Lakeshore Road crosses under the railway tracks, the sidewalk is very narrow and constrained by the bridge support piers at the back of the sidewalk, and metal guardrails at the curb.	▪ No intersecting north-south streets for 460 metres. ▪ Driveways into the commercial strip malls located at an average distance of 115 metres ▪ Crosswalks located at signalized intersections at Walden Circle, at the entrance to the Clarkson Shopping Centre (approx. 220mapart) and at Clarkson Road South (approx. 245 metres apart)	▪ Primarily vehicular use ▪ Low cyclist use ▪ Moderate pedestrian use
	VILLAGE CORE	▪ North 1-2 storey mixed-use ▪ South commercial strip retail with front parking lots and wide driveways	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) ▪ Lay-by parking on the north and south sides of the street	▪ On-street sharrows	▪ Wide sidewalks on both sides of Lakeshore Road with landscaped buffers and a unit paved furnishing zone along the curb ▪ There are street trees in the boulevards on both sides of the street, in planters on the south side, and in below-grade trenches on the north side ▪ Generous north sidewalks	▪ No intersecting north-south streets for 260 metres ▪ Driveways into the commercial strip malls on the south side at an average distance of 60 metres ▪ Crosswalks located at signalized intersections at Clarkson Road South, Clarkson Road North (approx. 75 metres apart) and at Meadow Wood Road (approx. 265 metres apart)	▪ Mix of vehicular, pedestrian and cycling use
	EAST VILLAGE GATEWAY	▪ Primarily of recreational / green space ▪ Some 1-2 storey commercial buildings with wide landscaped setbacks ▪ Future residential community 2-6 storeys.	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) ▪ Treed median at Johnson's Lane ▪ No lay-by or on-street parking	▪ On-street sharrows ▪ South side Multi-use path	▪ North sidewalk ends at Meadow Wood Road where it transitions to the multi-use path	▪ No intersecting north-south streets for 425 metres ▪ Crosswalks located at located at Meadow Wood Road and Johnson's Lane (approx. 425 metres apart)	▪ Primarily vehicular use ▪ Low local cyclist and pedestrian use ▪ Moderate recreational cyclist and pedestrian use

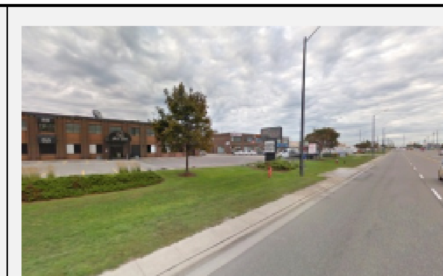
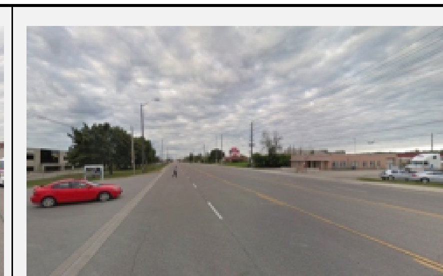
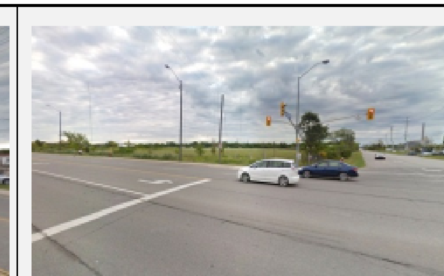
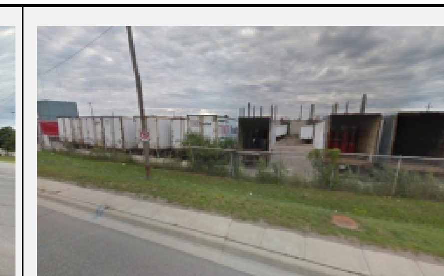
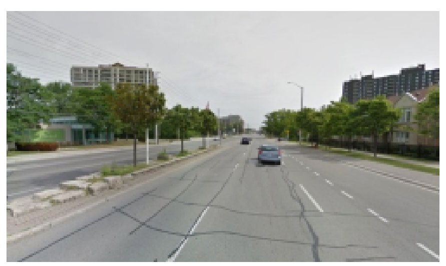
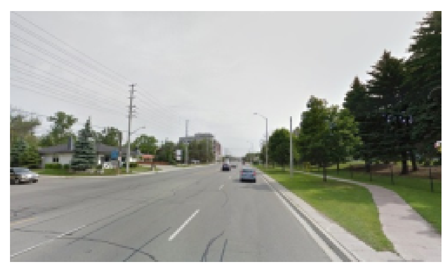
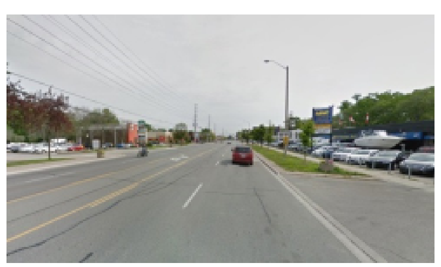
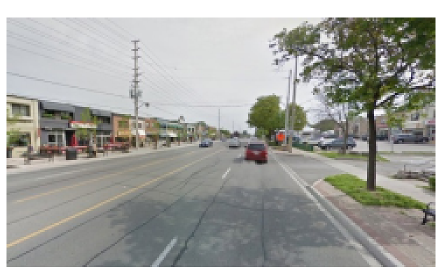
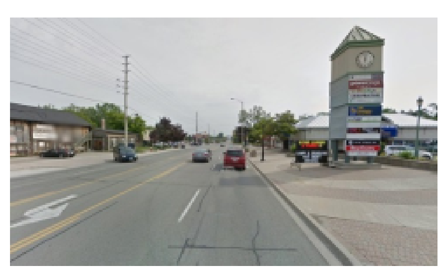
Character Area 3: Lorne Park Neighbourhood		▪ Recreational / parkland on south side ▪ Primarily back-lotted neighbourhoods with landscaped buffers. ▪ Some 1-2 storey residential facing Lakeshore Road	▪ 4 lane cross-section plus dedicated turning lanes at intersections. ▪ There is no lay-by or on-street parking in this area ▪ Off-street parking at Jack Darling Memorial Park. ▪ East of Shawnmarr Road, the south curb transitions to a mountable rolled curb with an asphalt parking boulevard between the road and sidewalk.	▪ Multi-use path on south side ▪ No Cycling facilities east of Shawnmarr Road	▪ Narrow sidewalk on the north side, separated from the curb by a grassy buffer of varying width. ▪ A retaining wall on the east side of Silver Birch Trail constricts the space for the north sidewalk for a short portion. Between Owenwood Drive and Jack Darling Memorial Park, where Lakeshore Road crosses Birchwood Creek, the width of the south path is constricted by a retaining wall and railing.	▪ North-south streets intersect Lakeshore Road at an average distance of 150 metres ▪ In the centre portion, North-south streets intersect Royal Windsor Drive at an average distance of 615 metres ▪ Crosswalks located at signalized intersections at Johnson's Lane, at Silver Birch Trail (approx. 295 metres apart), at Lorne Park Road (approx. 1 kilometre apart), at the entrance to Richard's Memorial Park (approx. 740 metres apart) and at Shawnmarr Road (approx. 465 metres apart)	▪ Primarily vehicular use ▪ Low local cyclist and pedestrian use ▪ Moderate recreational cyclist and pedestrian use
Character Area 4: Port Credit Neighbourhood West	PORT CREDIT NEIGHBOURHOOD WEST	▪ North side 1-3 storey mixed-use and commercial buildings with front parking ▪ South side 5-7 storey residential mid-rise buildings and some 1-3 storey commercial buildings	▪ 4 lane cross-section plus dedicated turning lanes at intersections ▪ Mountable curb with asphalt parking boulevard between the road and sidewalk	▪ No cycling facilities	▪ Concrete sidewalks on both sides of Lakeshore Road with asphalt boulevard	▪ North-south streets intersect Lakeshore Road at an average distance of 120 metres ▪ Crosswalks located at signalized intersections at Shawnmarr Road and at Maple Avenue (approx. 370 metres apart)	▪ Mixed vehicular, cyclist and pedestrian traffic
	IMPERIAL OIL LANDS	▪ North side 1-2 storey commercial properties and 1-3 storey townhouse residential buildings ▪ South side Imperial Oil Lands / brownfield development site	▪ 4 lane cross-section plus dedicated turning lanes at intersections ▪ Mountable curb with asphalt parking boulevard between the road and sidewalk	▪ No cycling facilities	▪ Concrete sidewalks on both sides of Lakeshore Road with asphalt boulevard	▪ No intersecting north-south streets on the south side for a distance of 550 metres ▪ One north-south street intersects Lakeshore Road at an average distance of 275 metres ▪ Crosswalks located at signalized intersections at Maple Avenue, at the entrance to the Loblaws shopping centre (across from Imperial Oil Lands) (approx. 455mapart) and at Mississauga Road (approximately 265 metres apart)	▪ Primarily vehicular use ▪ Moderate pedestrian and cyclist use
Character Area 5: Port Credit Community Node		▪ East of Credit river 1-3 storey mixed-use ▪ West of Credit River 3-4 storey midrise residential, some 1-3 storey commercial strips with front parking lots. ▪ Some 20+ storey high-rise residential towers with ground floor retail and landscaped setbacks	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) west of Credit River Bridge ▪ 4 lane cross-section plus dedicated turning lanes at Hurontario street east of Credit River Bridge ▪ Mountable curb with asphalt parking boulevard between the road and sidewalk west of Credit River Bridge ▪ Lay-by parking on the north and south sides east of the Credit River Bridge to Elmwood Avenue	▪ No cycling facilities ▪ Separate pedestrian and cycling bridge spans the Credit River south of main bridge.	▪ Concrete sidewalks separated from the curb by asphalt boulevard on both sides of the road west of the Credit River Bridge ▪ Generous sidewalks with unit paved boulevard and furnishing zone, ornamental plantings, seat walls and street furnishings and street trees in below-grade trenches east of Credit River Bridge ▪ Sidewalks on Credit River Bridge constrained by barriers and guardrails.	▪ North-south streets intersect Lakeshore Road at an average distance of 110 metres in ▪ Crosswalks located at signalized intersections at Mississauga Road, at John Street (approx. 201 metres apart), at Stavebank Road (approx. 290 metres apart), at Elizabeth Street (approx. 122 metres apart), at Hurontario Street (approx. 310m apart) and at Elmwood Avenue (approx. 265 metres apart)	▪ Mixed vehicular, cyclist and pedestrian traffic
Character Area 6: Port Credit Neighbourhood East		▪ 3-4 storey residential and 1-2 storey mixed-use	▪ 4 lane cross-section plus dedicated turning lanes at intersections	▪ No cycling facilities	▪ Generous sidewalks on both sides of Lakeshore Road with unit paved boulevard and furnishing zone, ornamental plantings, seat walls and street furnishings and street trees in below-grade trenches	▪ North-south streets intersect Lakeshore Road at an average distance of 100 metres on north side ▪ North-south streets intersect Lakeshore Road at an average distance of 100 metres on south side ▪ Crosswalks located at signalized intersections at Elmwood Avenue, at Cumberland Drive (approx. 245mapart) and at Hiawatha Pkwy (approx. 235mapart)	▪ Mixed vehicular, cyclist and pedestrian traffic

Character Area 7: Lakeview Neighbourhood		▪ North side between Seneca Avenue and Shaw Drive, are 7-8 storey mid-rise residential buildings with wide landscaped setbacks ▪ Between Shaw Drive and Enola Avenue are 1 storey commercial units with front parking	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) and concrete medians at intersections ▪ No on-street parking ▪ Lay-by parking on north side between Shaw Drive and Enola Avenue ▪ Mountable curb with asphalt parking boulevard between the road and sidewalk on south side between Cawthra Road and West Avenue	▪ No cycling facilities	▪ Narrow sidewalk adjacent to the curb transitioning to include a paved boulevard with furnishing zone on north side east of Enola Avenue	▪ North-south streets intersect Lakeshore Road at an average distance of 100 metres west of Cooksville Creek ▪ North-south streets intersect Lakeshore Road at an average distance of 150 metres east of Cooksville Creek ▪ Crosswalks located at signalized intersections at Hiawatha Pkwy, at Shaw Drive (approx. 510 metres apart), at Cawthra (approx. 780 metres apart) and at East Avenue (approx. 360 metres apart)	▪ Primarily vehicular use ▪ Low pedestrian and cyclist use
Character Area 8: Lakeview Employment Area	LAKEVIEW DEVELOPMENT LANDS	▪ 1-3 storey mixed use properties with front parking ▪ Some 6-7 storey mid-rise residential towers east of Orchard Road ▪ Few detached houses throughout.	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) ▪ No lay-by or on-street parking ▪ Wide landscaped setbacks west of Hydro road	▪ No cycling facilities west of Hydro Road ▪ Waterfront Trail on south side at Hydro Road, going eastward	▪ No south side sidewalk East of Hydro Road ▪ Concrete sidewalk with a unit paved boulevard and furnishings zone adjacent to the curb on north side	▪ North-south streets intersect Lakeshore Road at an average distance of 120 metres on north side ▪ Only one north-south street intersects Lakeshore Road at an average distance of 435 metres on south side ▪ Crosswalks located at signalized intersections at East Avenue, at Lakefront Promenade (approx. 375 metres apart), at Ogden Avenue (approx. 270 metres apart) and at Haig Boulevard (approx. 405 metres apart)	▪ Primarily vehicular use ▪ Low pedestrian and cyclist use
	EAST BOUNDARY	▪ 1-2 storey residential on north side ▪ Some 1 storey commercial properties with front parking and several mid-rise towers with large landscaped setbacks on north side ▪ Recreational / Park land on south side including Arsenal Lands, Marie Curtis Park	▪ Five lanes with continuous centre two-way-left-turn lane (CTWLTL) ▪ 4 lanes at Etobicoke Creek Bridge ▪ No lay-by or on-street parking ▪ Bus lay-bys on north and south sides of Lakeshore Road	▪ Waterfront Trail on south side west of Dixie Road ▪ No cycling facilities east of Dixie Road	▪ Concrete sidewalks with a unit paver boulevard and furnishing zones on both sides of the road between Fergus and Dixie Road ▪ East of Dixie Road, the north sidewalk narrows and is adjacent to the curb ▪ No south sidewalk between Dixie Road and Marie Curtis Park	▪ North-south streets intersect Lakeshore Road at an average distance of 140 metres on north side ▪ No north-south streets crossing on south side. ▪ Crosswalks located at signalized intersections at Haig Boulevard, at Dixie Road (approx. 620 metres apart), and at the driveway to the condominium at 1515 Lakeshore Road E., which is across from Marie Curtis Park (approx. 490 metres apart). The next crosswalk to the east is located at Forty Second Street, outside the boundaries of this study, approx. 255 metres away.	▪ Primarily vehicular use ▪ Low local cyclist and pedestrian use ▪ Moderate recreational cyclist and pedestrian use

Lakeshore Road Transportation Master Plan (TMP) and Implementation Strategy

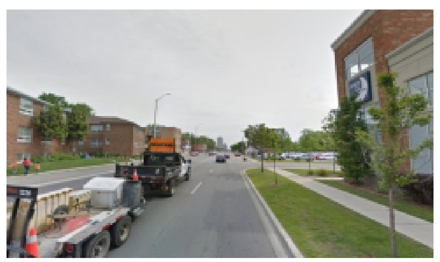
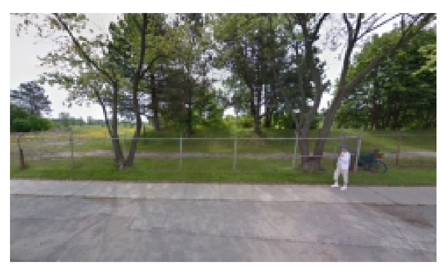
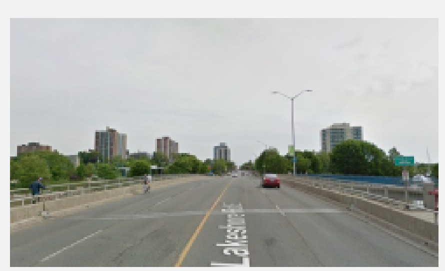
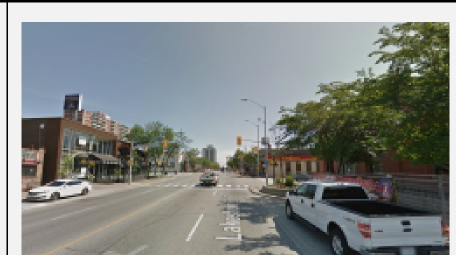
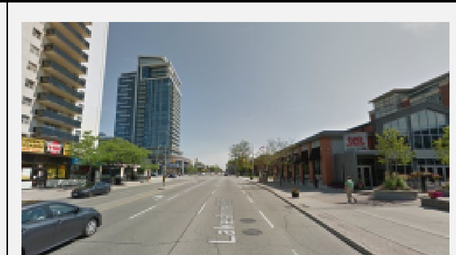
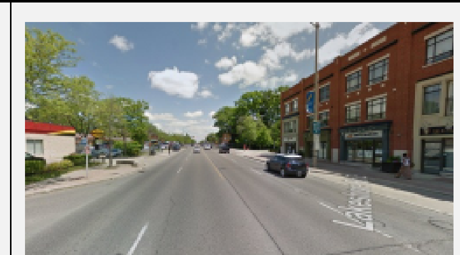
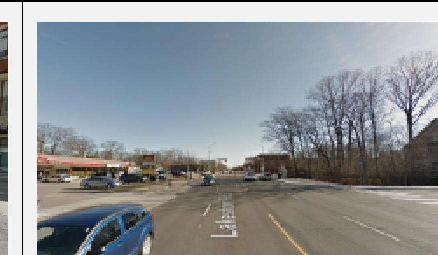
Existing Conditions Analysis – Character Area Photos

2016-07-18

Character Area	Sub-area						
Character Area 1: Southdown Road Employment Lands	INDUSTRIAL STRIP	 Wide Landscaped Setbacks	 Fenced Park on South Side of Road	 No Sidewalks on South Side	 Wide Driveways	 Vacant Lot on South Side	 Industrial / Commercial Yards
	COMMERCIAL STRIP	 North Side Strip Retail	 South Side Channelized Driveway				
Character Area 2: Clarkson Village Community Node	WEST VILLAGE GATEWAY	 Southdown and Lakeshore Road	 South Side Landscaped Boulevard				
	OUTER VILLAGE CORE	 Retail Strip	 Rail Underpass				
	VILLAGE CORE	 Clarkson Village Core	 Widened Sidewalk on South Side				

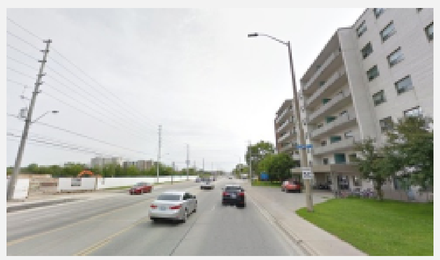
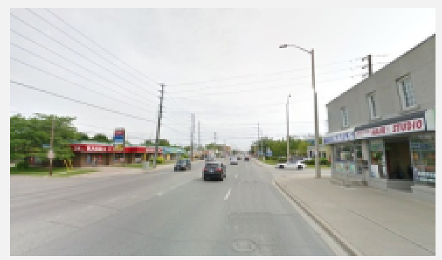
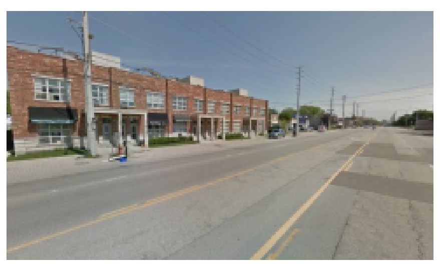
Existing Conditions Analysis – Character Area Photos

2016-07-18

	EAST VILLAGE GATEWAY	 Multi-use Path on South Side	 On-Road Sharrows				
Character Area 3: Lorne Park Neighbourhood		 Landscaped Setbacks	 Waterfront Trail on South Side	 Jack Darling Memorial Park	 Parking Boulevards		
Character Area 4: Port Credit Neighbourhood West	PORT CREDIT NEIGHBOURHOOD WEST	 West Neighbourhood	 Sawtooth North Side Setbacks				
	IMPERIAL OIL LANDS	 Imperial Oil Lands on the South	 Imperial Oil Lands				
Character Area 5: Port Credit Community Node		 3-4 storey residential	 Credit River Bridge	 1-3 storey mixed-use main street	 High-rise residential at Hurontario	 2-3 storey mixed-use	 1-2 storey commercial

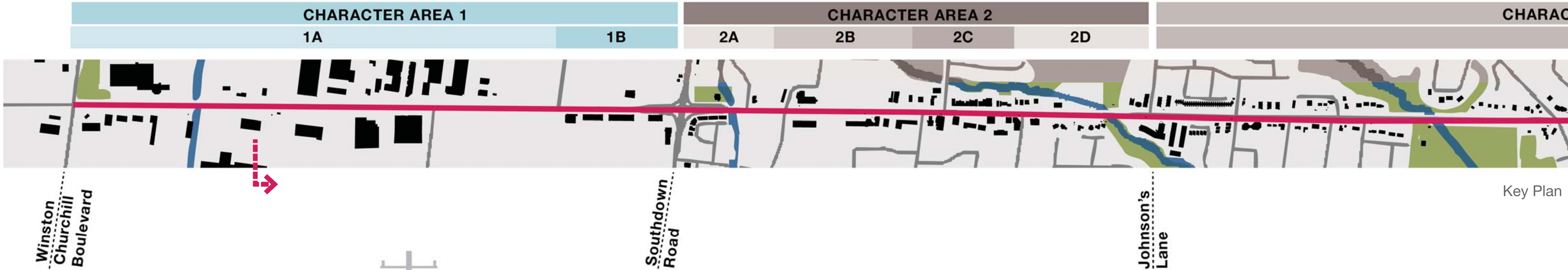
Existing Conditions Analysis – Character Area Photos

2016-07-18

Character Area 6: Port Credit Neighbourhood East		 Street Trees on South Side	 Mixed-Use Developments				
Character Area 7: Lakeview Neighbourhood		 North Side Development Site	 Mixed-Use and Retail				
Character Area 8: Lakeview Employment Area	LAKEVIEW DEVELOPMENT LANDS	 Mixed-Use on North Side	 South Side Lakeview Development Lands				
	EAST BOUNDARY	 Development Parcel on North Side	 Arsenal Lands Wall	 No Sidewalk Along Arsenal Lands	 Etobicoke Creek Bridge		

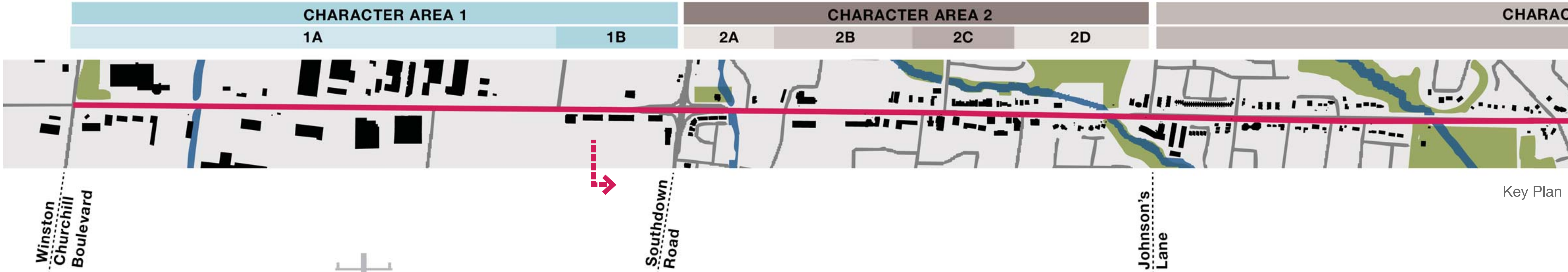
Appendix B

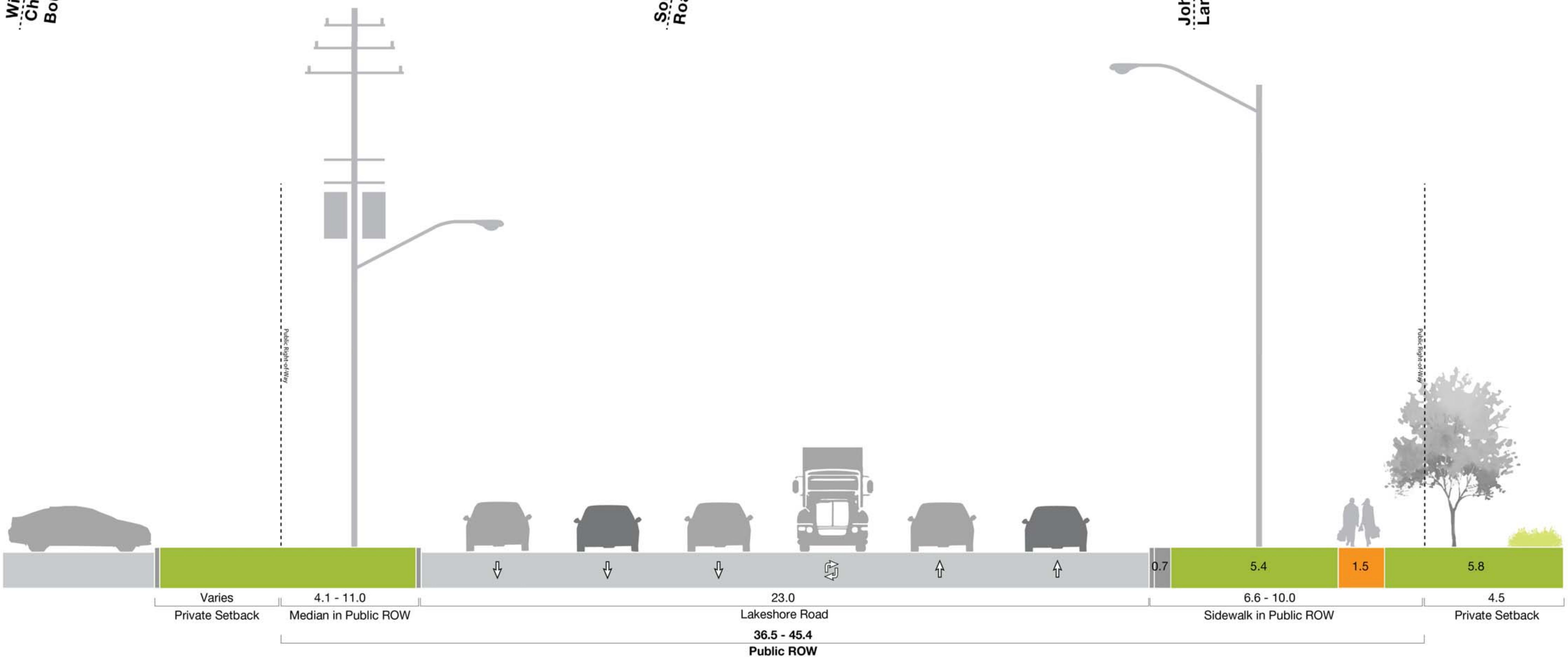
Existing Typical Cross-sections



Character Area 1A: Southdown Road Employment Area
Industrial Strip: Winston Churchill Boulevard to Clarkson Go Yard Access Road

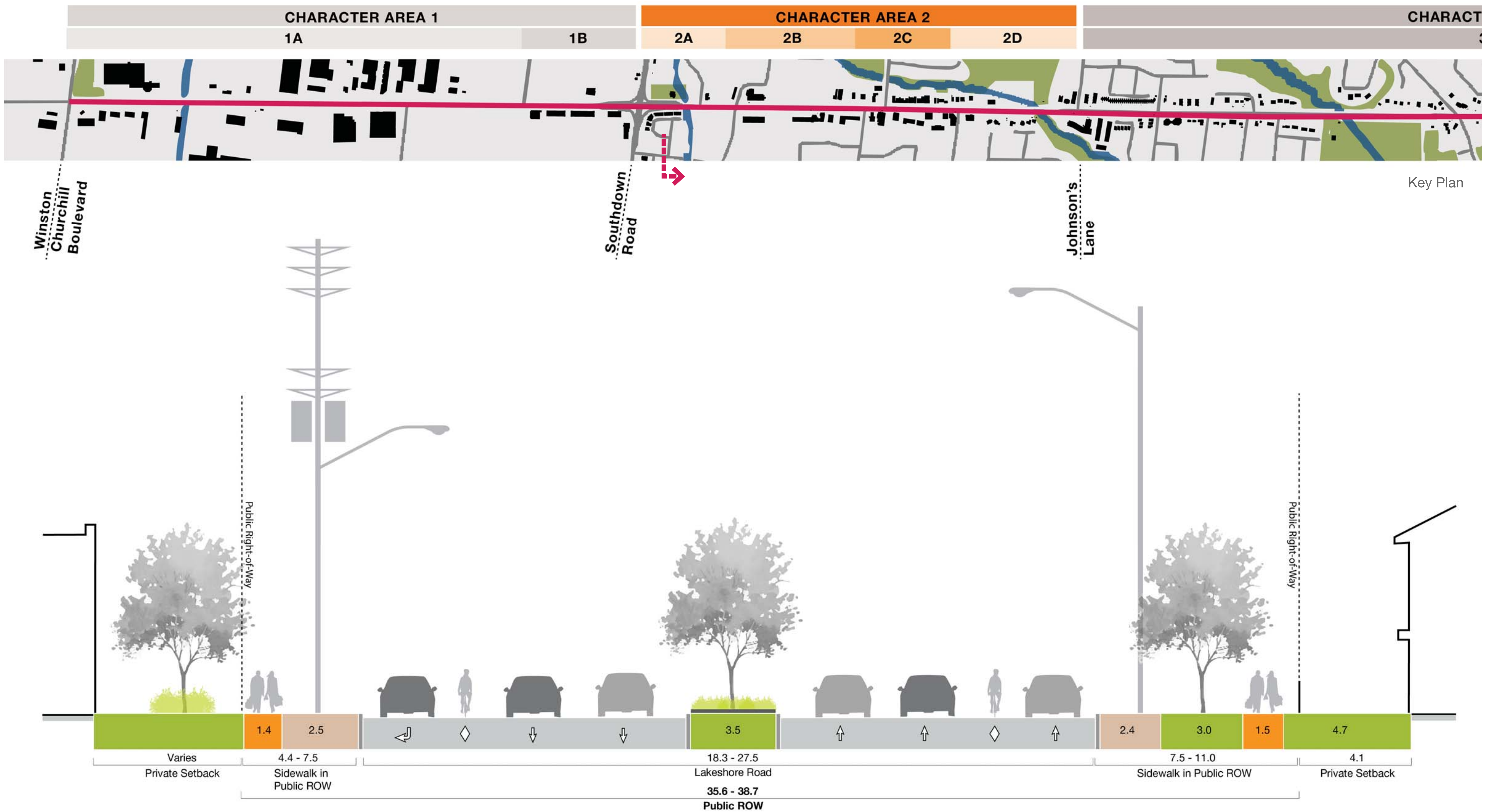
dtah





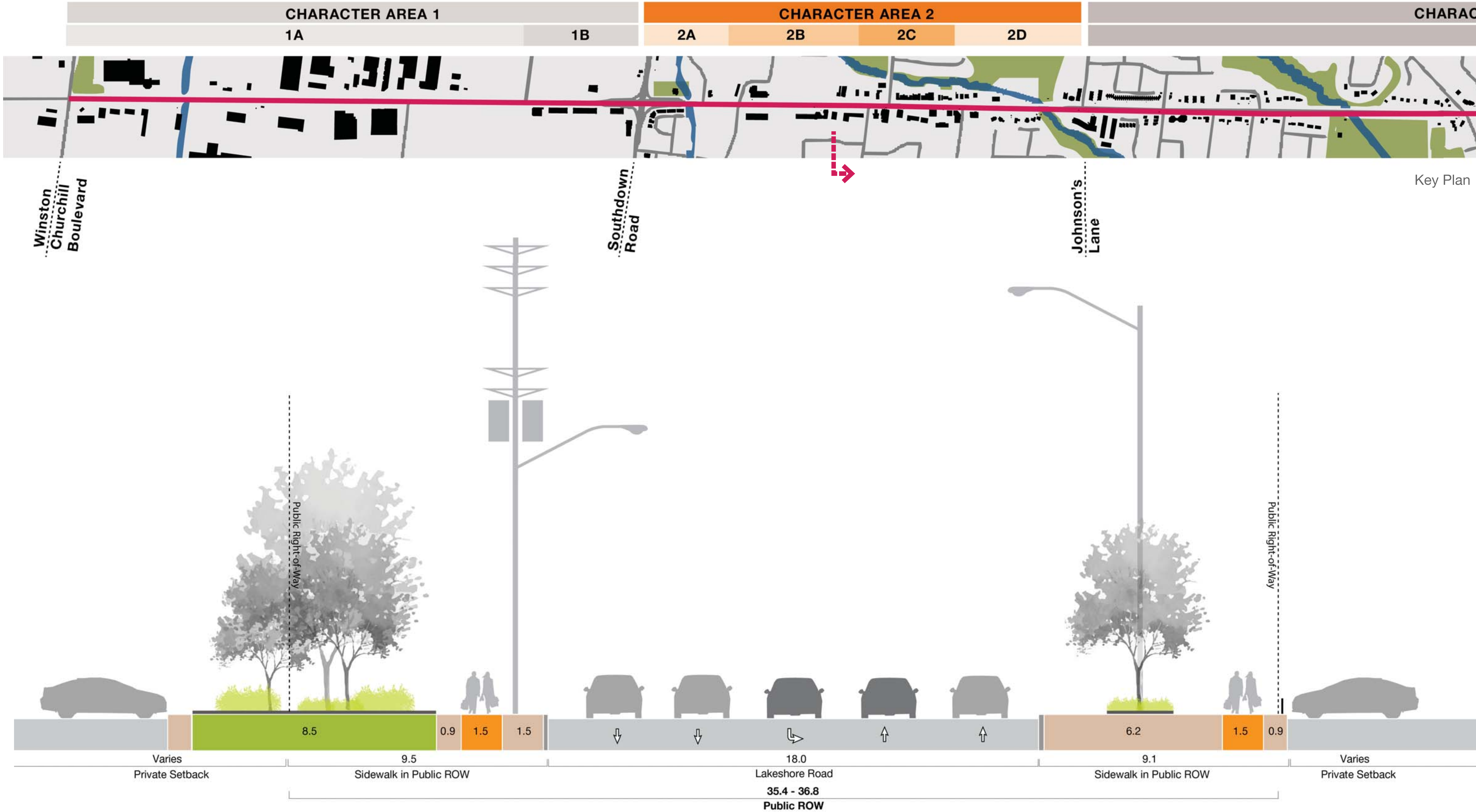
Character Area 1B: Southdown Road Employment Area
Commercial Strip: Clarkson GO Yard Access Road to Southdown Road

dtah



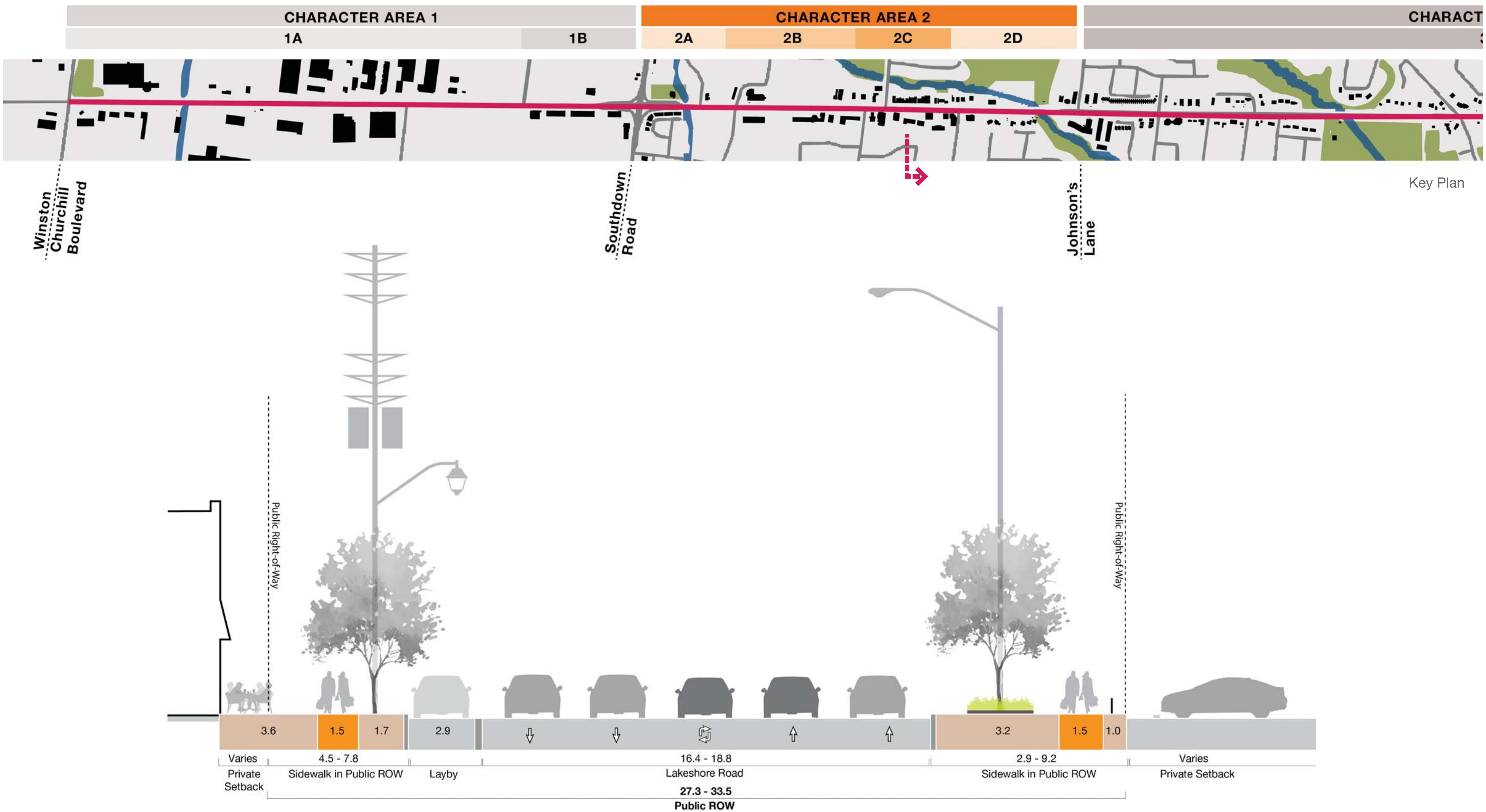
Character Area 2A: Clarkson Village Community Node
West Village Gateway: Southdown Road to Walden Circle

dtah



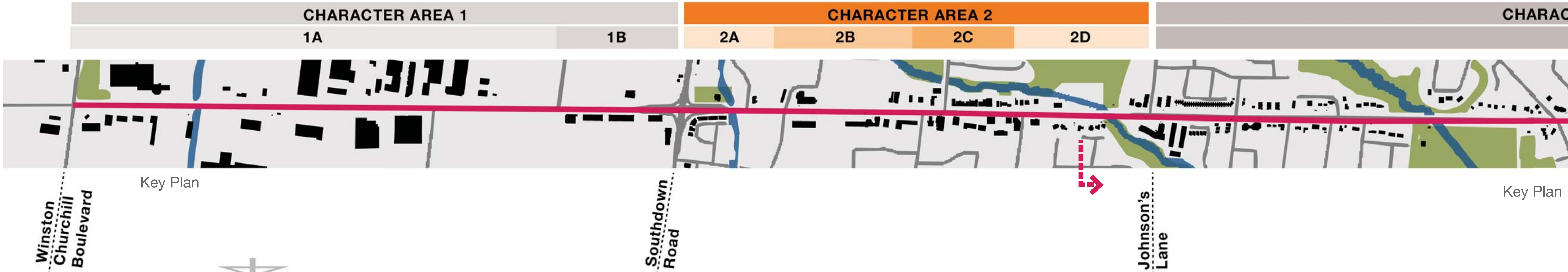
Character Area 2B: Clarkson Village Community Node
Outer Village Core: Walden Circle to Clarkson Road South

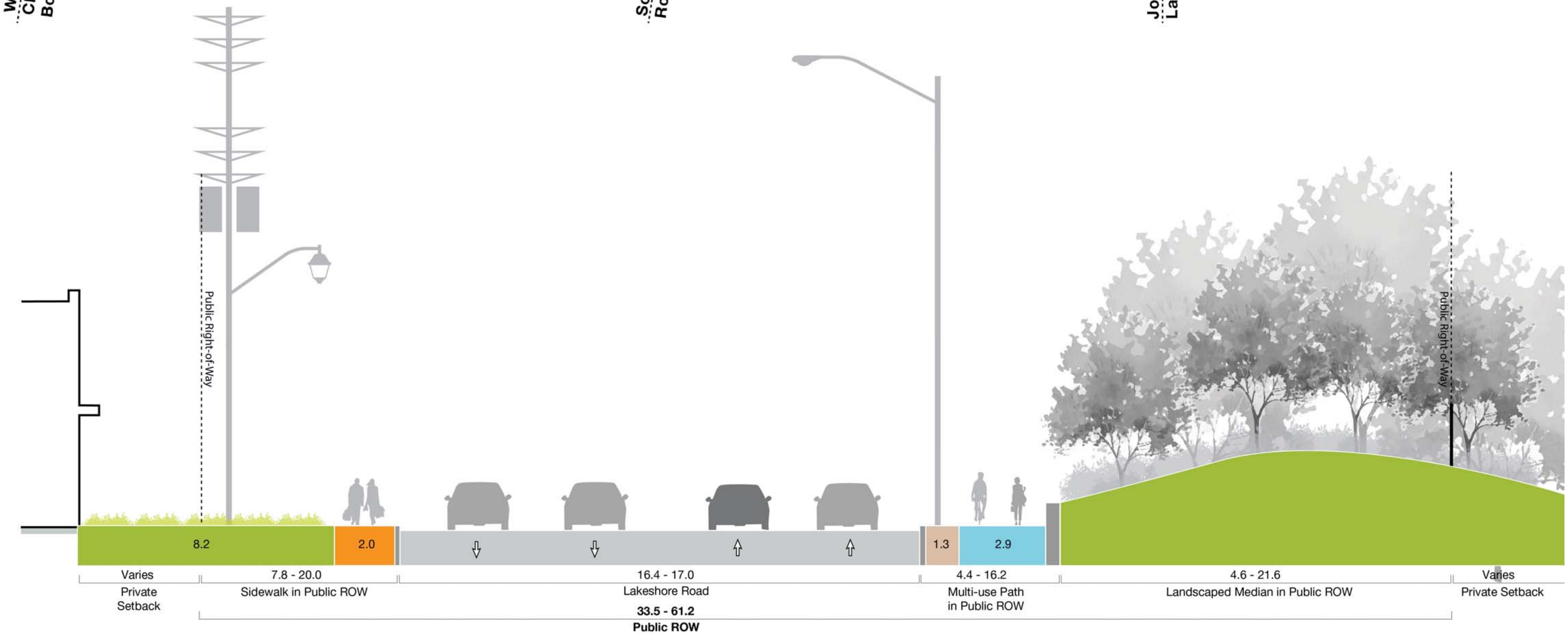
dtah



Character Area 2C: Clarkson Village Community Node
Village Core: Clarkson Road South to Meadow Wood Road

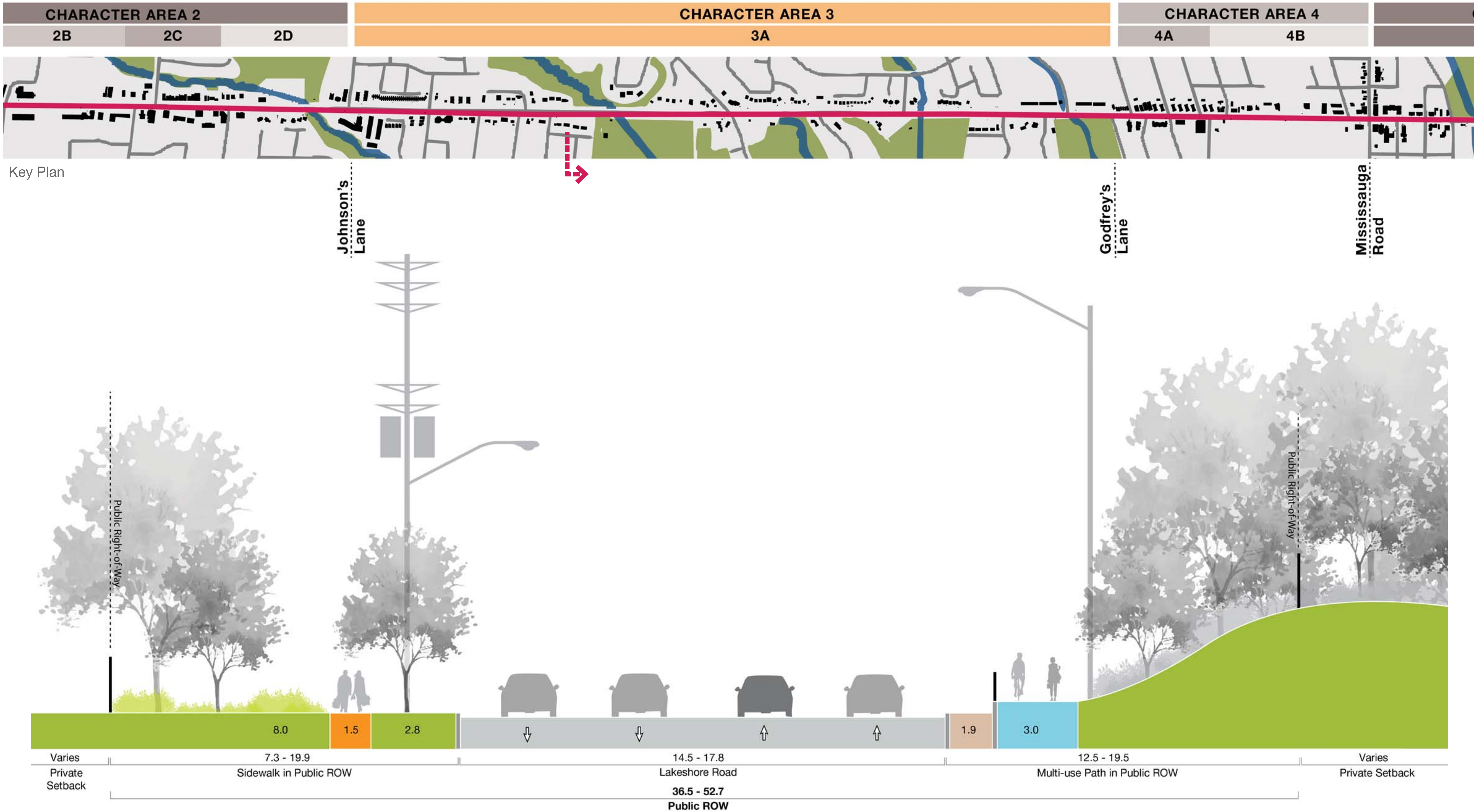
dtah





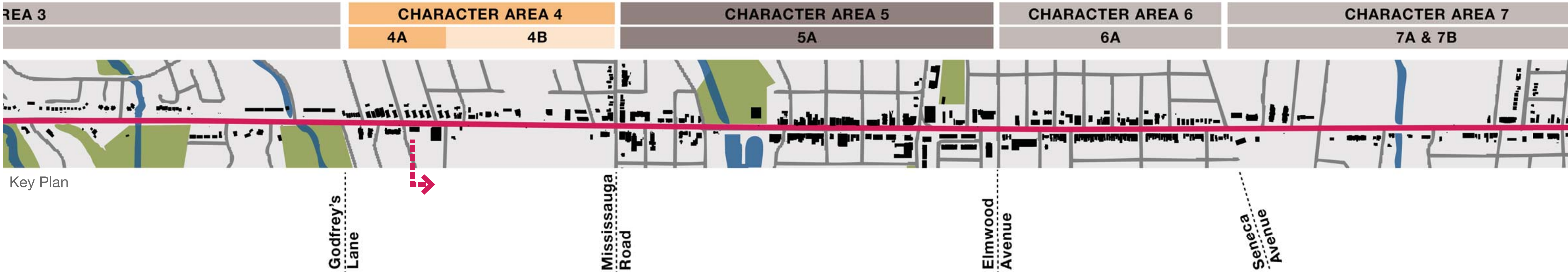
Character Area 2D: Clarkson Village Community Node
East Village Gateway: Meadow Wood Road to Johnson's Lane

dtah



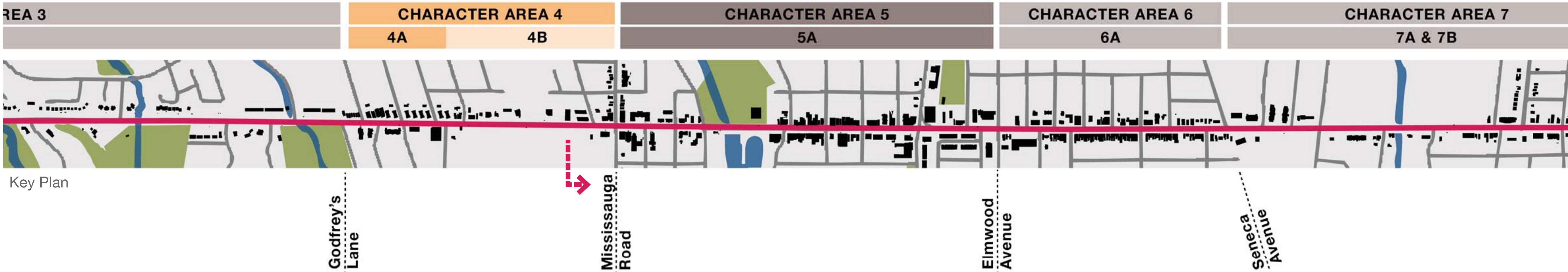
Character Area 3: Lorne Park Neighbourhood
Johnson's Lane to Godfrey's Lane

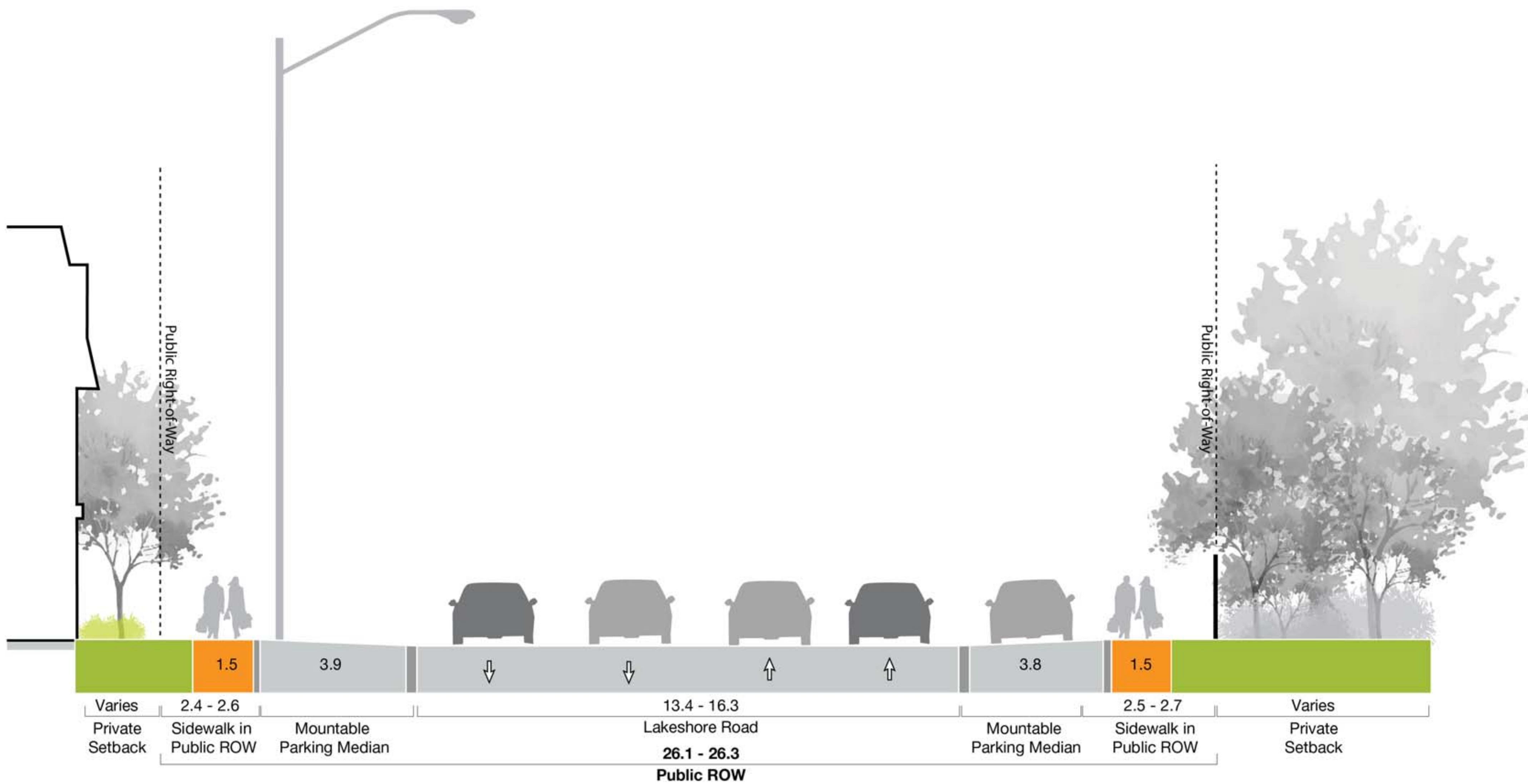
dtah



Character Area 4A: Port Credit Neighbourhood West
Godfrey's Lane to Benson Avenue

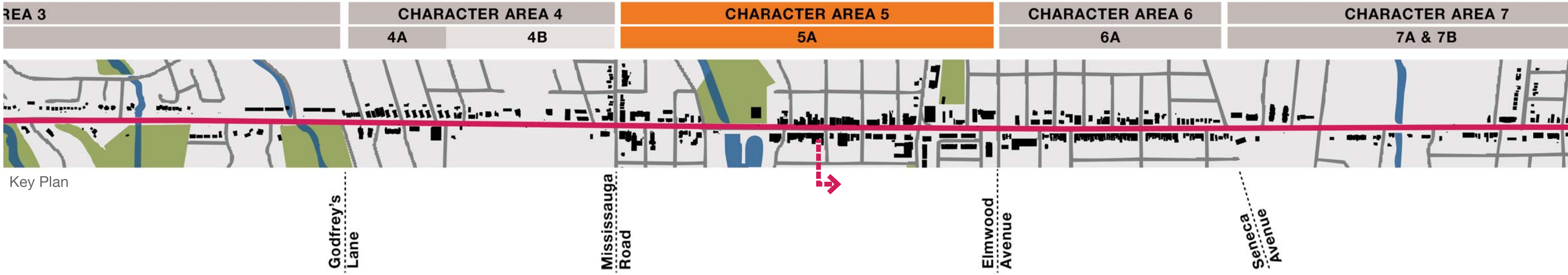
dtah

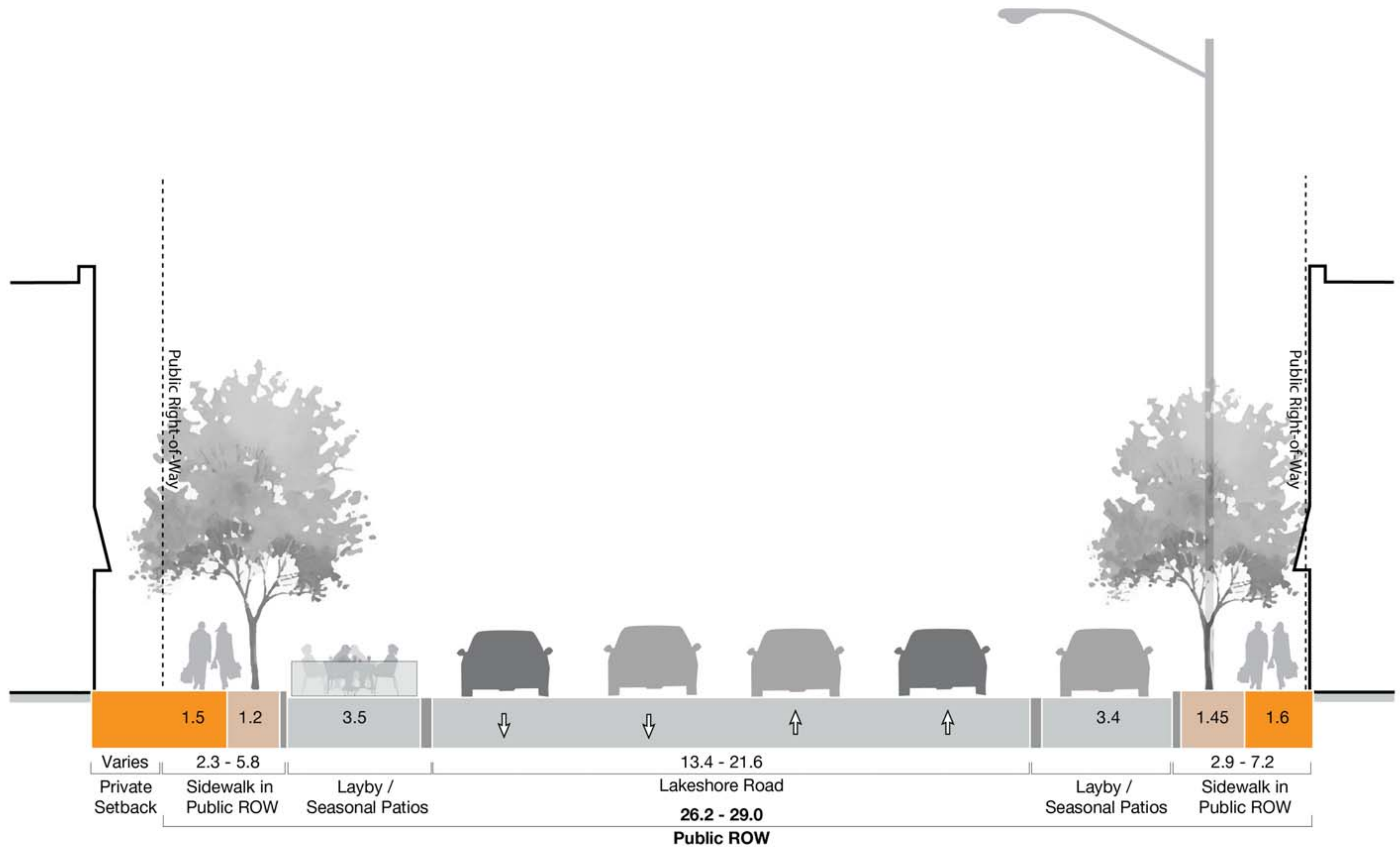




Character Area 4B: Port Credit Neighbourhood West
Imperial Oil Lands: Benson Avenue to Mississauga Road South

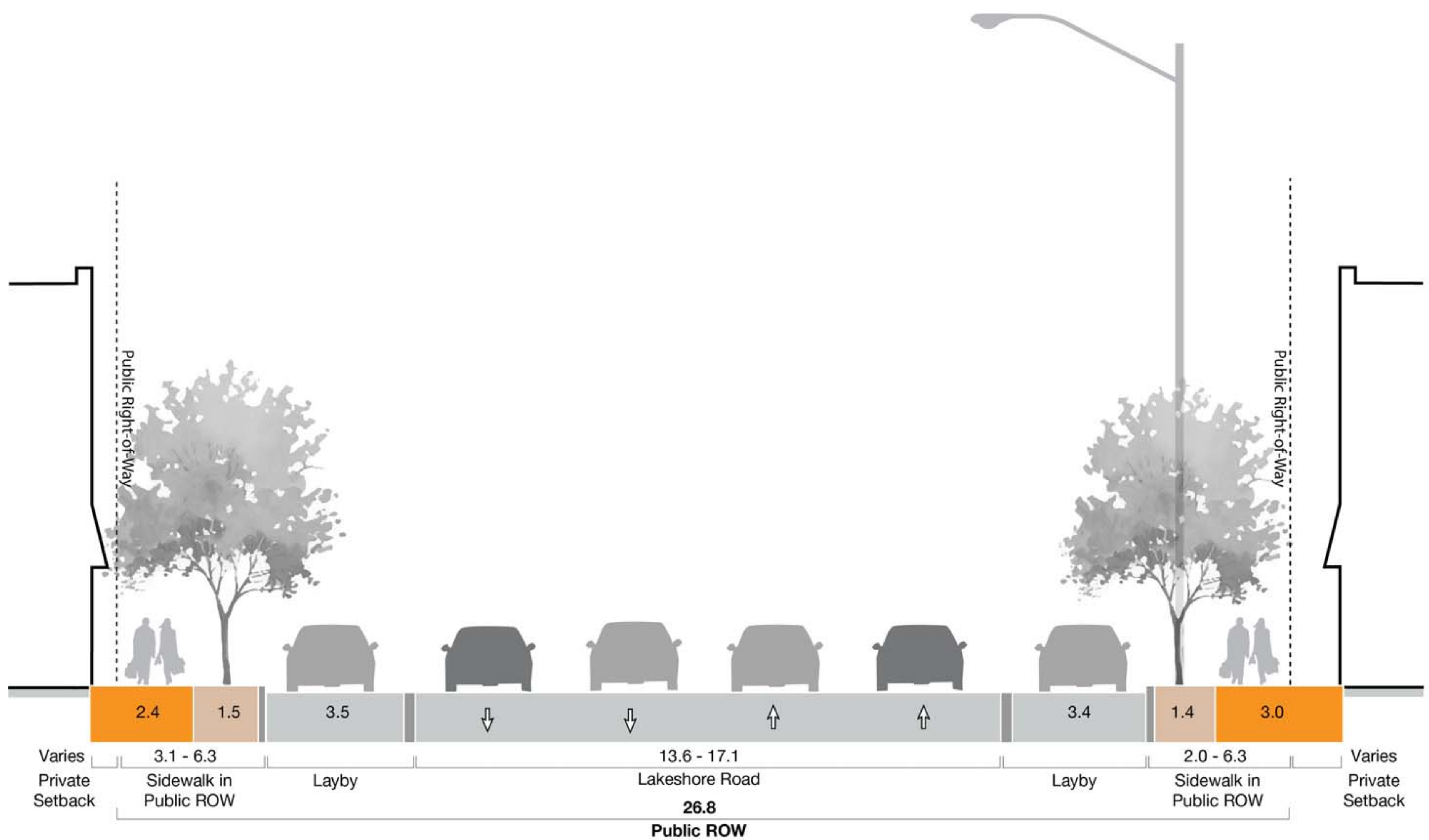
dtah



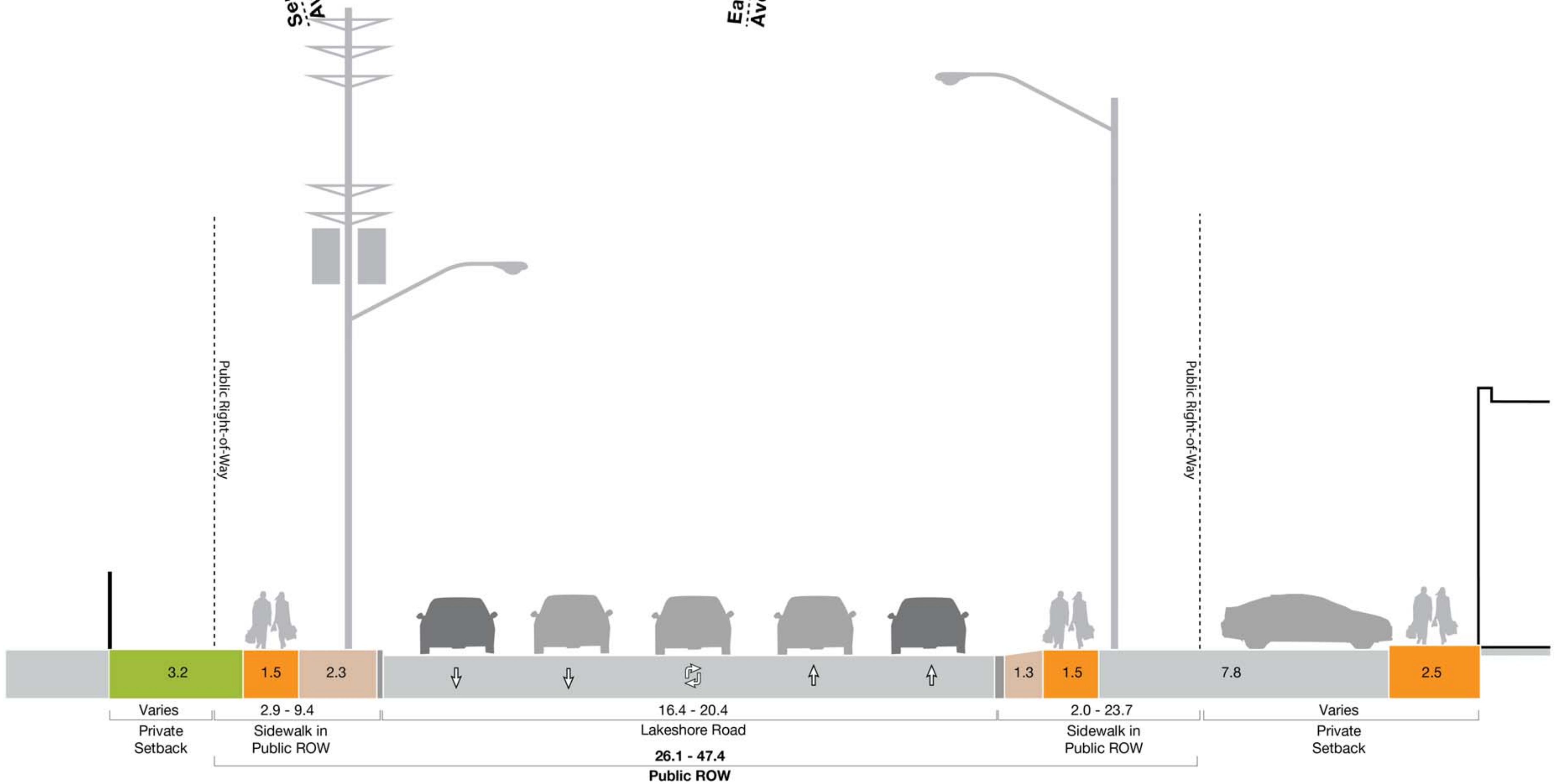


Character Area 5: **Port Credit Community Node**
Mississauga Road South to Elmwood Avenue

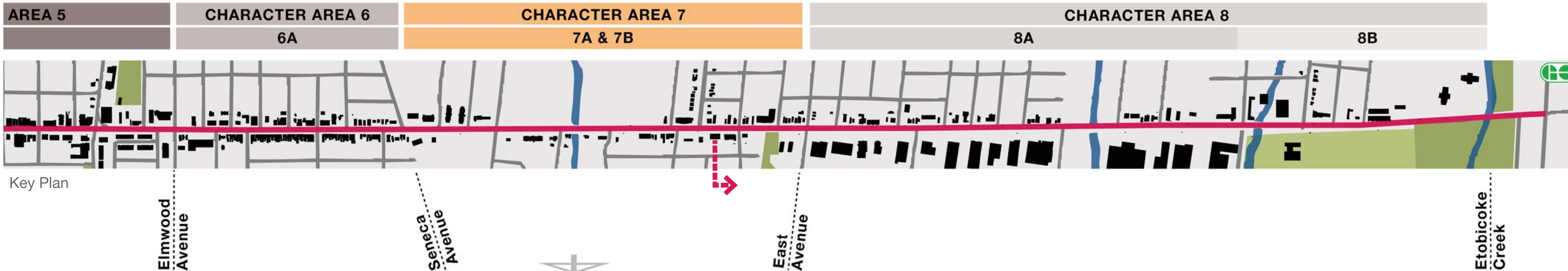
dtah

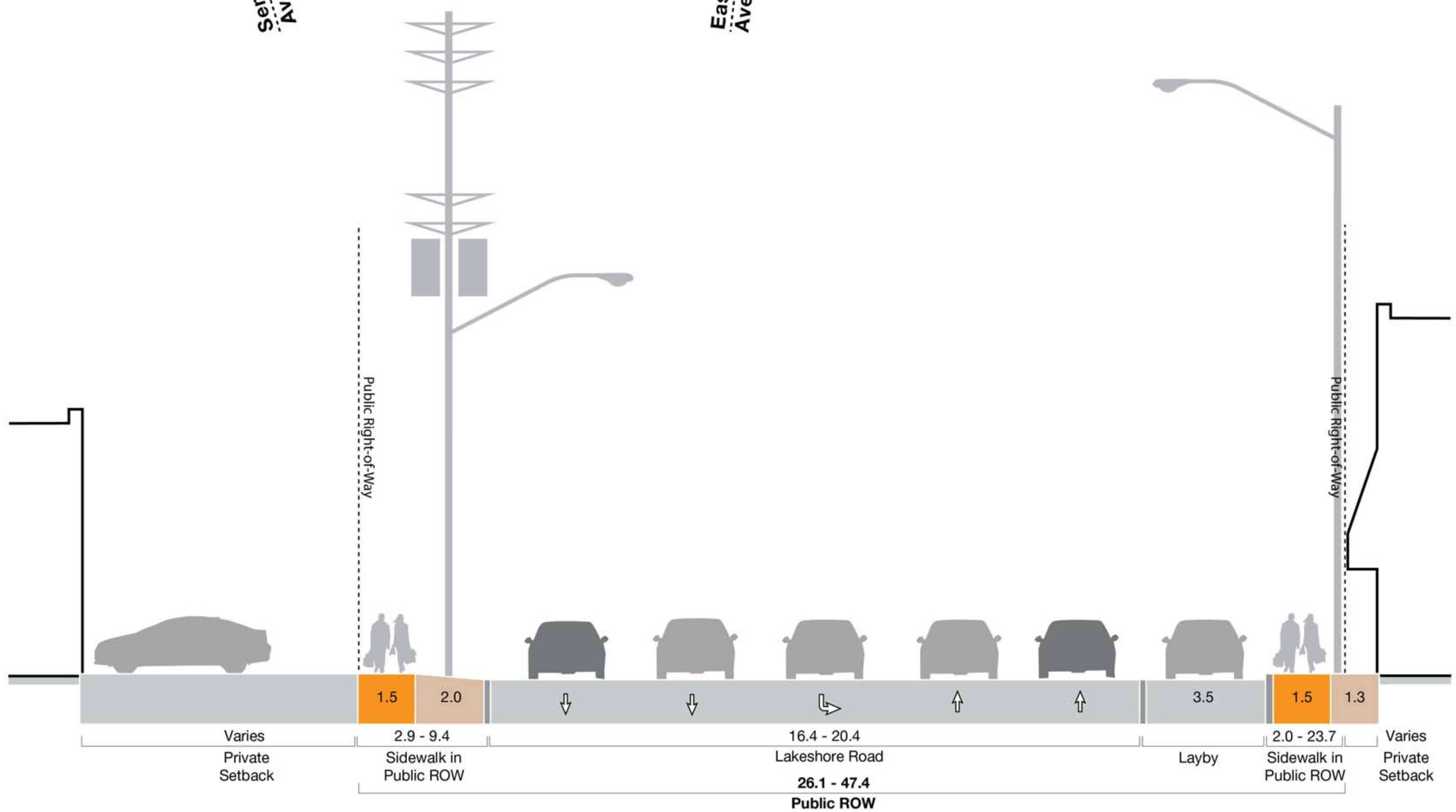


Character Area 6: Port Credit Neighbourhood East
Elmwood Avenue to Seneca Avenue



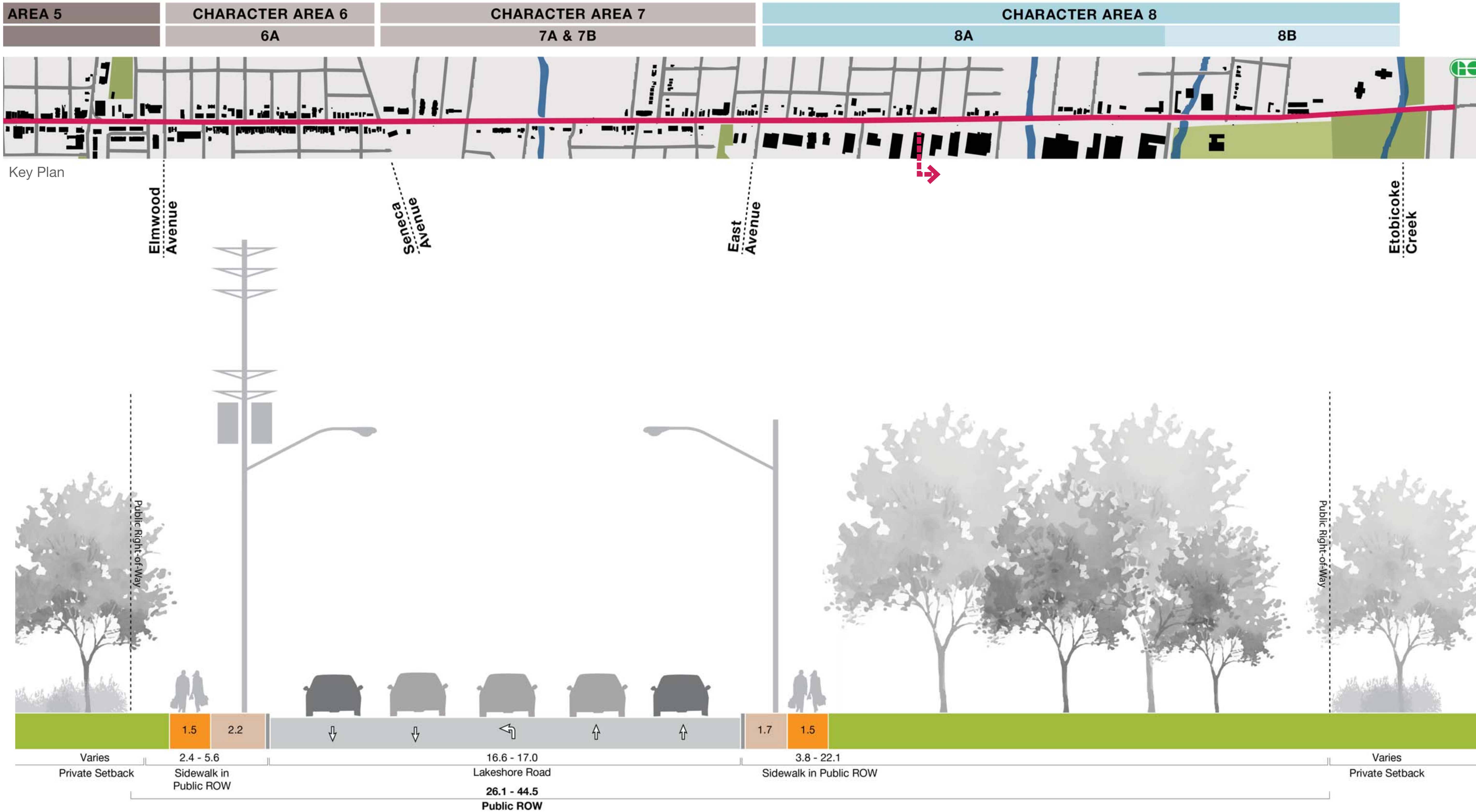
Character Area 7A: Lakeview Neighbourhood
Seneca Avenue to East Avenue





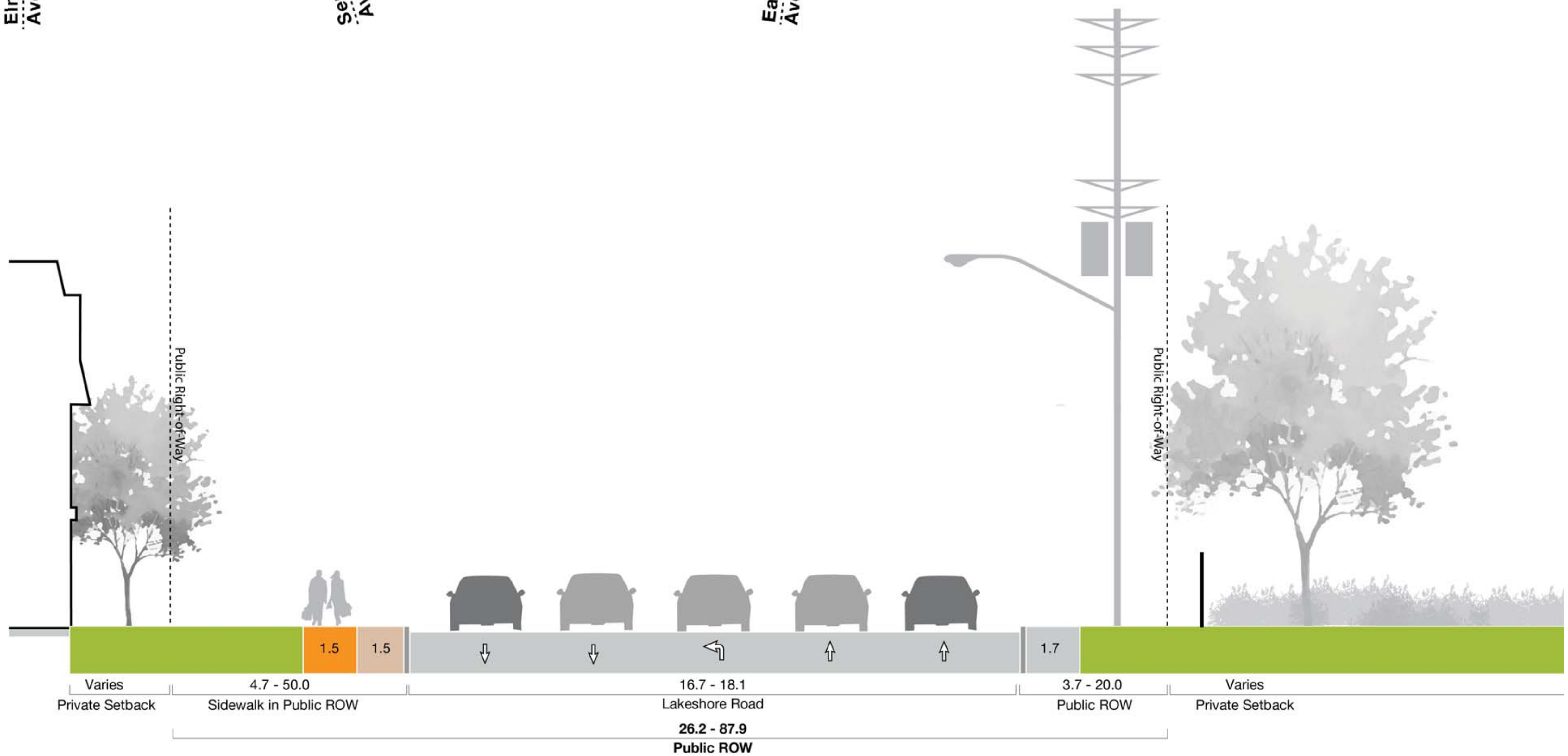
Character Area 7B: Lakeview Neighbourhood
Seneca Avenue to East Avenue

dtah



Character Area 8A: Lakeview Employment Area
Lakeview Development Lands: East Avenue to Fergus Avenue

dtah



Character Area 8B: Lakeview Employment Area
East Boundary: Fergus Avenue to Etobicoke Creek Bridge

Appendix C

Synchro Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	0	21	17	5	33	10	540	15	19	496	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			1.00		0.98	1.00		0.96	1.00	
Frt		0.97			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.96			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728			1667		1753	3488		1642	3479	
Flt Permitted		0.73			0.89		0.46	1.00		0.44	1.00	
Satd. Flow (perm)		1317			1508		846	3488		768	3479	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	0	21	17	5	33	10	540	15	19	496	27
RTOR Reduction (vph)	0	18	0	0	29	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	85	0	0	26	0	10	553	0	19	520	0
Confl. Peds. (#/hr)	23		18	18		23	17		43	43		17
Confl. Bikes (#/hr)						1			2			2
Heavy Vehicles (%)	2%	0%	0%	5%	0%	0%	0%	4%	0%	4%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		9.1			8.1		48.9	48.9		48.9	48.9	
Effective Green, g (s)		9.1			8.1		48.9	48.9		48.9	48.9	
Actuated g/C Ratio		0.13			0.12		0.70	0.70		0.70	0.70	
Clearance Time (s)		6.0			7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		171			174		591	2437		537	2430	
v/s Ratio Prot								c0.16			0.15	
v/s Ratio Perm		c0.06			0.02		0.01			0.02		
v/c Ratio		0.50			0.15		0.02	0.23		0.04	0.21	
Uniform Delay, d1		28.3			27.8		3.2	3.8		3.3	3.7	
Progression Factor		1.00			1.00		1.23	1.15		1.27	1.14	
Incremental Delay, d2		2.3			0.4		0.0	0.2		0.1	0.2	
Delay (s)		30.6			28.2		4.0	4.6		4.3	4.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		30.6			28.2			4.6			4.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	28	29	10	25	214	20	609	29	251	465	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.94		1.00	1.00		1.00	1.00	0.90
Flpb, ped/bikes	0.97	1.00		0.97	1.00		0.96	1.00		0.99	1.00	1.00
Frt	1.00	0.92		1.00	0.87		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1713	1735		1733	1559		1713	3470		1754	3544	1430
Flt Permitted	0.41	1.00		0.72	1.00		0.48	1.00		0.36	1.00	1.00
Satd. Flow (perm)	737	1735		1313	1559		875	3470		669	3544	1430
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	156	28	29	10	25	214	20	609	29	251	465	205
RTOR Reduction (vph)	0	23	0	0	168	0	0	2	0	0	0	39
Lane Group Flow (vph)	156	34	0	10	71	0	20	636	0	251	465	166
Confl. Peds. (#/hr)	31		18	18		32	24		22	22		24
Confl. Bikes (#/hr)			1			3			3			1
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	4%	5%	1%	3%	1%
Turn Type	Perm			Perm			Perm			pm+pt		Perm
Protected Phases		8			4			6		5	2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	29.9	29.9		29.9	29.9		80.5	80.5		96.1	96.1	96.1
Effective Green, g (s)	29.9	29.9		29.9	29.9		80.5	80.5		96.1	96.1	96.1
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.58	0.58		0.69	0.69	0.69
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	157	371		280	333		503	1995		557	2433	982
v/s Ratio Prot		0.02			0.05			0.18		c0.04	0.13	
v/s Ratio Perm	c0.21			0.01			0.02			c0.27		0.12
v/c Ratio	0.99	0.09		0.04	0.21		0.04	0.32		0.45	0.19	0.17
Uniform Delay, d1	55.0	44.2		43.6	45.3		12.9	15.5		8.5	7.9	7.8
Progression Factor	1.00	1.00		1.00	1.00		1.09	1.10		1.00	1.00	1.00
Incremental Delay, d2	69.6	0.1		0.1	0.3		0.1	0.4		0.6	0.2	0.4
Delay (s)	124.6	44.3		43.7	45.7		14.2	17.4		9.1	8.1	8.2
Level of Service	F	D		D	D		B	B		A	A	A
Approach Delay (s)		103.1			45.6			17.3			8.4	
Approach LOS		F			D			B			A	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	935	1	1	540	149	0	3	3	158	4	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	7.0		7.0	7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	1.00
Satd. Flow (prot)	1724	3529		1744	3378			1538			1832	1542
Flt Permitted	0.34	1.00		0.31	1.00			1.00			0.73	1.00
Satd. Flow (perm)	623	3529		561	3378			1538			1398	1542
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	360	935	1	1	540	149	0	3	3	158	4	147
RTOR Reduction (vph)	0	0	0	0	15	0	0	3	0	0	0	123
Lane Group Flow (vph)	360	936	0	1	674	0	0	3	0	0	162	24
Confl. Peds. (#/hr)	9		1	1		9	2					2
Confl. Bikes (#/hr)			19			14						14
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	86.7	86.7		69.8	69.8			19.3			19.3	19.3
Effective Green, g (s)	86.7	86.7		69.8	69.8			19.3			19.3	19.3
Actuated g/C Ratio	0.72	0.72		0.58	0.58			0.16			0.16	0.16
Clearance Time (s)	3.0	7.0		7.0	7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	578	2550		326	1965			247			225	248
v/s Ratio Prot	c0.07	0.27			0.20			0.00				
v/s Ratio Perm	c0.38			0.00							c0.12	0.02
v/c Ratio	0.62	0.37		0.00	0.34			0.01			0.72	0.10
Uniform Delay, d1	6.5	6.3		10.5	13.1			42.3			47.8	42.9
Progression Factor	1.30	0.29		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.0	0.4		0.0	0.5			0.0			10.5	0.2
Delay (s)	10.4	2.2		10.5	13.6			42.4			58.3	43.1
Level of Service	B	A		B	B			D			E	D
Approach Delay (s)		4.5			13.6			42.4			51.1	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	21	1268	589	35	47	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.4	3.3	3.5	3.7
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.96
Flpb, ped/bikes	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1617	3362	3139		1475	1297
Flt Permitted	0.42	1.00	1.00		0.95	1.00
Satd. Flow (perm)	707	3362	3139		1475	1297
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1268	589	35	47	37
RTOR Reduction (vph)	0	0	2	0	0	34
Lane Group Flow (vph)	21	1268	622	0	47	3
Confl. Peds. (#/hr)	17			17		16
Heavy Vehicles (%)	5%	5%	11%	11%	21%	21%
Turn Type	Perm					Perm
Protected Phases		2	2		4	
Permitted Phases	2					4
Actuated Green, G (s)	98.2	98.2	98.2		9.8	9.8
Effective Green, g (s)	98.2	98.2	98.2		9.8	9.8
Actuated g/C Ratio	0.82	0.82	0.82		0.08	0.08
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	579	2751	2569		120	106
v/s Ratio Prot		c0.38	0.20		c0.03	
v/s Ratio Perm	0.03					0.00
v/c Ratio	0.04	0.46	0.24		0.39	0.03
Uniform Delay, d1	2.0	3.2	2.5		52.3	50.7
Progression Factor	0.58	0.34	0.37		1.00	1.00
Incremental Delay, d2	0.1	0.5	0.2		2.1	0.1
Delay (s)	1.3	1.6	1.1		54.4	50.8
Level of Service	A	A	A		D	D
Approach Delay (s)		1.6	1.1		52.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	1535	8	2	516	43	5	4	3	55	9	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		0.99	1.00	
Frt	1.00	1.00		1.00	0.99			0.97		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1673	3391		1614	3224			1547		1653	1519	
Flt Permitted	0.44	1.00		0.14	1.00			0.86		0.75	1.00	
Satd. Flow (perm)	779	3391		239	3224			1361		1305	1519	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	1535	8	2	516	43	5	4	3	55	9	56
RTOR Reduction (vph)	0	0	0	0	4	0	0	3	0	0	50	0
Lane Group Flow (vph)	73	1543	0	2	555	0	0	9	0	55	15	0
Confl. Peds. (#/hr)	2		3	3		2	12		5	5		12
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	16%	16%	16%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	95.2	95.2		95.2	95.2			11.8		11.8	11.8	
Effective Green, g (s)	95.2	95.2		95.2	95.2			11.8		11.8	11.8	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.10		0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	618	2690		190	2558			134		128	149	
v/s Ratio Prot		c0.45			0.17						0.01	
v/s Ratio Perm	0.09			0.01				0.01		c0.04		
v/c Ratio	0.12	0.57		0.01	0.22			0.07		0.43	0.10	
Uniform Delay, d1	2.8	4.7		2.6	3.1			49.1		50.9	49.3	
Progression Factor	1.23	2.60		0.58	0.45			1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.8		0.1	0.2			0.2		2.3	0.3	
Delay (s)	3.8	13.0		1.6	1.6			49.3		53.2	49.5	
Level of Service	A	B		A	A			D		D	D	
Approach Delay (s)		12.6			1.6			49.3			51.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1530	51	18	543	1	43	12	18	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0				
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00				
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	0.99				
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.91				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	1654	3362	1392	1628	3298		1529	1492				
Flt Permitted	0.45	1.00	1.00	0.14	1.00		0.76	1.00				
Satd. Flow (perm)	782	3362	1392	246	3298		1218	1492				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	1530	51	18	543	1	43	12	18	0	0	0
RTOR Reduction (vph)	0	0	5	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	8	1530	46	18	544	0	43	14	0	0	0	0
Confl. Peds. (#/hr)	3		8	8		3	4		3	3		4
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	16%	16%	16%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)	95.2	95.2	95.2	95.2	95.2		11.8	11.8				
Effective Green, g (s)	95.2	95.2	95.2	95.2	95.2		11.8	11.8				
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.79		0.10	0.10				
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	620	2667	1104	195	2616		120	147				
v/s Ratio Prot		c0.46			0.16			0.01				
v/s Ratio Perm	0.01		0.03	0.07			c0.04					
v/c Ratio	0.01	0.57	0.04	0.09	0.21		0.36	0.09				
Uniform Delay, d1	2.6	4.7	2.7	2.8	3.1		50.6	49.2				
Progression Factor	0.27	0.51	0.16	2.35	1.99		1.00	1.00				
Incremental Delay, d2	0.0	0.8	0.1	0.9	0.2		1.8	0.3				
Delay (s)	0.7	3.2	0.5	7.4	6.3		52.4	49.5				
Level of Service	A	A	A	A	A		D	D				
Approach Delay (s)		3.1			6.3			51.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	1368	112	43	420	8	23	8	48	15	10	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0		8.0	8.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1659	3362	1414	1570	3180	1346	1677	1558		1631	1653	
Flt Permitted	0.51	1.00	1.00	0.17	1.00	1.00	0.75	1.00		0.72	1.00	
Satd. Flow (perm)	884	3362	1414	284	3180	1346	1319	1558		1237	1653	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	27	1368	112	43	420	8	23	8	48	15	10	6
RTOR Reduction (vph)	0	0	8	0	0	2	0	27	0	0	5	0
Lane Group Flow (vph)	27	1368	104	43	420	6	23	29	0	15	11	0
Confl. Peds. (#/hr)	1		3	3		1	4		4	4		4
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	6%	6%	6%	9%	9%	9%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	92.4	92.4	92.4	92.4	92.4	92.4	13.6	13.6		13.6	13.6	
Effective Green, g (s)	92.4	92.4	92.4	92.4	92.4	92.4	13.6	13.6		13.6	13.6	
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.77	0.77	0.11	0.11		0.11	0.11	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0		8.0	8.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	681	2589	1089	219	2449	1036	149	177		140	187	
v/s Ratio Prot		c0.41			0.13			c0.02			0.01	
v/s Ratio Perm	0.03		0.07	0.15		0.00	0.02			0.01		
v/c Ratio	0.04	0.53	0.10	0.20	0.17	0.01	0.15	0.17		0.11	0.06	
Uniform Delay, d1	3.3	5.4	3.4	3.7	3.7	3.2	48.0	48.1		47.8	47.5	
Progression Factor	0.78	0.70	0.72	0.77	0.33	0.23	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7	0.2	2.0	0.2	0.0	0.5	0.4		0.3	0.1	
Delay (s)	2.7	4.5	2.6	4.9	1.4	0.7	48.5	48.5		48.1	47.6	
Level of Service	A	A	A	A	A	A	D	D		D	D	
Approach Delay (s)		4.3			1.7			48.5			47.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	420	1225	0	0	380	100	0	0	0	255	0	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	7.0			7.0					7.0	7.0	3.0
Lane Util. Factor	1.00	0.95			0.95					0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00			0.99					1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00					1.00	1.00	1.00
Frt	1.00	1.00			0.97					1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)	1658	3394			2867					1615	1651	1400
Flt Permitted	0.45	1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)	794	3394			2867					1615	1651	1400
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	420	1225	0	0	380	100	0	0	0	255	0	245
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	184
Lane Group Flow (vph)	420	1225	0	0	466	0	0	0	0	127	128	61
Confl. Peds. (#/hr)	6		2	2		6	19		1	1		19
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	4%	0%	0%	21%	9%	0%	0%	0%	5%	0%	12%
Turn Type	pm+pt			Perm			Perm			Split		pm+ov
Protected Phases	5	2			6			3		4	4	5
Permitted Phases	2			6			3					4
Actuated Green, G (s)	90.0	90.0			73.1					16.0	16.0	29.9
Effective Green, g (s)	90.0	90.0			73.1					16.0	16.0	29.9
Actuated g/C Ratio	0.75	0.75			0.61					0.13	0.13	0.25
Clearance Time (s)	3.0	7.0			7.0					7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	696	2546			1746					215	220	349
v/s Ratio Prot	c0.07	0.36			0.16					c0.08	0.08	0.02
v/s Ratio Perm	c0.38											0.02
v/c Ratio	0.60	0.48			0.27					0.59	0.58	0.17
Uniform Delay, d1	5.1	5.9			10.9					48.9	48.9	35.4
Progression Factor	1.00	1.00			1.43					1.00	1.00	1.00
Incremental Delay, d2	1.5	0.7			0.4					4.3	3.9	0.2
Delay (s)	6.6	6.5			16.1					53.2	52.7	35.6
Level of Service	A	A			B					D	D	D
Approach Delay (s)		6.5			16.1			0.0			44.5	
Approach LOS		A			B			A			D	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1544	10	29	774	27	7	9	28	35	25	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3427	1400	1626	3275		1701	1633		1688	1572	
Flt Permitted	0.34	1.00	1.00	0.15	1.00		0.53	1.00		0.73	1.00	
Satd. Flow (perm)	606	3427	1400	250	3275		953	1633		1302	1572	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	1544	10	29	774	27	7	9	28	35	25	89
RTOR Reduction (vph)	0	0	1	0	1	0	0	26	0	0	81	0
Lane Group Flow (vph)	34	1544	9	29	800	0	7	11	0	35	33	0
Confl. Peds. (#/hr)	15		12	12		15	20		10	10		20
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)	116.0	116.0	116.0	116.0	116.0		12.0	12.0		12.0	12.0	
Effective Green, g (s)	116.0	116.0	116.0	116.0	116.0		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.83	0.83	0.83	0.83	0.83		0.09	0.09		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	502	2840	1160	207	2714		82	140		112	135	
v/s Ratio Prot		c0.45			0.24			0.01			0.02	
v/s Ratio Perm	0.06		0.01	0.12			0.01			c0.03		
v/c Ratio	0.07	0.54	0.01	0.14	0.29		0.09	0.08		0.31	0.24	
Uniform Delay, d1	2.2	3.7	2.1	2.3	2.7		58.9	58.9		60.1	59.8	
Progression Factor	0.77	0.63	0.77	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.7	0.0	1.4	0.3		0.5	0.3		1.6	0.9	
Delay (s)	1.9	3.1	1.6	3.7	3.0		59.4	59.2		61.7	60.7	
Level of Service	A	A	A	A	A		E	E		E	E	
Approach Delay (s)		3.0			3.0			59.2			60.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	1276	10	15	586	15	44	5	22	112	9	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.98	1.00		0.98	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1699	3282		1670	3209		1750	1638		1694	1698	
Flt Permitted	0.42	1.00		0.19	1.00		0.75	1.00		0.74	1.00	
Satd. Flow (perm)	758	3282		339	3209		1373	1638		1319	1698	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	1276	10	15	586	15	44	5	22	112	9	9
RTOR Reduction (vph)	0	0	0	0	1	0	0	19	0	0	8	0
Lane Group Flow (vph)	11	1286	0	15	600	0	44	8	0	112	10	0
Confl. Peds. (#/hr)	4		10	10		4	12		14	14		12
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	110.7	110.7		110.7	110.7		17.3	17.3		17.3	17.3	
Effective Green, g (s)	110.7	110.7		110.7	110.7		17.3	17.3		17.3	17.3	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.12	0.12		0.12	0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	599	2595		268	2537		170	202		163	210	
v/s Ratio Prot		c0.39			0.19			0.00			0.01	
v/s Ratio Perm	0.01			0.04			0.03			c0.08		
v/c Ratio	0.02	0.50		0.06	0.24		0.26	0.04		0.69	0.05	
Uniform Delay, d1	3.1	5.0		3.2	3.8		55.5	54.0		58.8	54.1	
Progression Factor	0.06	0.13		0.96	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6		0.4	0.2		0.8	0.1		11.4	0.1	
Delay (s)	0.2	1.2		3.5	3.8		56.4	54.1		70.2	54.2	
Level of Service	A	A		A	A		E	D		E	D	
Approach Delay (s)		1.2			3.8			55.5			67.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1476	36	8	591	29	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.4	3.3	3.3	3.4	3.5	3.5
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3148		1595	3076	1684	1476
Flt Permitted	1.00		0.15	1.00	0.95	1.00
Satd. Flow (perm)	3148		257	3076	1684	1476
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1476	36	8	591	29	14
RTOR Reduction (vph)	1	0	0	0	0	13
Lane Group Flow (vph)	1511	0	8	591	29	1
Confl. Peds. (#/hr)		11	11			5
Heavy Vehicles (%)	6%	6%	9%	9%	6%	6%
Parking (#/hr)	0			0		
Turn Type			Perm			Perm
Protected Phases	2			2	4	
Permitted Phases			2			4
Actuated Green, G (s)	116.6		116.6	116.6	11.4	11.4
Effective Green, g (s)	116.6		116.6	116.6	11.4	11.4
Actuated g/C Ratio	0.83		0.83	0.83	0.08	0.08
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2622		214	2562	137	120
v/s Ratio Prot	c0.48			0.19	c0.02	
v/s Ratio Perm			0.03			0.00
v/c Ratio	0.58		0.04	0.23	0.21	0.01
Uniform Delay, d1	3.8		2.0	2.4	60.1	59.1
Progression Factor	0.28		0.86	0.85	1.00	1.00
Incremental Delay, d2	0.9		0.3	0.2	0.8	0.0
Delay (s)	1.9		2.0	2.3	60.9	59.1
Level of Service	A		A	A	E	E
Approach Delay (s)	1.9			2.3	60.3	
Approach LOS	A			A	E	

Intersection Summary			
HCM Average Control Delay	3.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	1282	17	1	658	12	21	0	8	7	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			0.95	
Flpb, ped/bikes		1.00			1.00			0.95			1.00	
Frt		1.00			1.00			0.96			0.92	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3333			3184			1694			1560	
Flt Permitted		0.93			0.95			0.77			0.87	
Satd. Flow (perm)		3099			3038			1360			1381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	1282	17	1	658	12	21	0	8	7	0	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	7	0	0	10	0
Lane Group Flow (vph)	0	1324	0	0	670	0	0	22	0	0	8	0
Confl. Peds. (#/hr)	6		4	4		6	31		2	2		31
Confl. Bikes (#/hr)			3			1			1			
Heavy Vehicles (%)	4%	0%	11%	0%	5%	0%	0%	0%	0%	0%	0%	9%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		114.8			114.8			11.2			11.2	
Effective Green, g (s)		114.8			114.8			11.2			11.2	
Actuated g/C Ratio		0.82			0.82			0.08			0.08	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2541			2491			109			110	
v/s Ratio Prot												
v/s Ratio Perm		c0.43			0.22			c0.02			0.01	
v/c Ratio		0.52			0.27			0.20			0.07	
Uniform Delay, d1		4.0			2.9			60.2			59.6	
Progression Factor		0.77			1.19			1.00			1.00	
Incremental Delay, d2		0.7			0.3			0.9			0.3	
Delay (s)		3.7			3.7			61.1			59.9	
Level of Service		A			A			E			E	
Approach Delay (s)		3.7			3.7			61.1			59.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	5.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	1126	5	36	605	174	6	61	18	194	83	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1624	3530	1469	1609	3394	1404	1504	1783		1706	1847	1356
Flt Permitted	0.38	1.00	1.00	0.25	1.00	1.00	0.70	1.00		0.71	1.00	1.00
Satd. Flow (perm)	642	3530	1469	428	3394	1404	1113	1783		1267	1847	1356
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	327	1126	5	36	605	174	6	61	18	194	83	224
RTOR Reduction (vph)	0	0	1	0	0	50	0	8	0	0	0	130
Lane Group Flow (vph)	327	1126	4	36	605	124	6	71	0	194	83	94
Confl. Peds. (#/hr)	25		8	8		25	18		20	20		18
Confl. Bikes (#/hr)			3			2			1			
Heavy Vehicles (%)	7%	0%	0%	8%	4%	6%	16%	4%	0%	2%	4%	15%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt		Perm	Perm		Perm	Perm			Perm		pm+ov
Protected Phases	5	2			6			4			8	5
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	100.2	100.2	100.2	81.7	81.7	81.7	26.8	26.8		26.8	26.8	42.3
Effective Green, g (s)	100.2	100.2	100.2	81.7	81.7	81.7	26.8	26.8		26.8	26.8	42.3
Actuated g/C Ratio	0.72	0.72	0.72	0.58	0.58	0.58	0.19	0.19		0.19	0.19	0.30
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	568	2526	1051	250	1981	819	213	341		243	354	410
v/s Ratio Prot	c0.06	0.32			0.18			0.04			0.04	0.03
v/s Ratio Perm	c0.35		0.00	0.08		0.09	0.01			c0.15		0.04
v/c Ratio	0.58	0.45	0.00	0.14	0.31	0.15	0.03	0.21		0.80	0.23	0.23
Uniform Delay, d1	7.7	8.3	5.7	13.3	14.8	13.3	46.0	47.7		54.0	47.9	36.6
Progression Factor	0.33	0.40	0.29	1.04	1.02	1.25	1.00	1.00		1.17	1.20	0.54
Incremental Delay, d2	0.9	0.3	0.0	1.2	0.4	0.4	0.1	0.3		16.4	0.3	0.3
Delay (s)	3.4	3.6	1.6	15.0	15.5	17.0	46.1	48.0		79.7	57.8	20.0
Level of Service	A	A	A	B	B	B	D	D		E	E	B
Approach Delay (s)		3.6			15.8			47.8			49.4	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	2095	8	6	681	12	22	19	17	40	8	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.96		1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.93	1.00	
Frt		1.00			1.00		1.00	0.93		1.00	0.87	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3351			3133		1759	1715		1059	1472	
Flt Permitted		0.95			0.93		0.71	1.00		0.73	1.00	
Satd. Flow (perm)		3198			2904		1311	1715		818	1472	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	2095	8	6	681	12	22	19	17	40	8	67
RTOR Reduction (vph)	0	0	0	0	1	0	0	15	0	0	60	0
Lane Group Flow (vph)	0	2106	0	0	698	0	22	21	0	40	15	0
Confl. Peds. (#/hr)	19					19	8		36	36		8
Confl. Bikes (#/hr)			2			5						
Heavy Vehicles (%)	0%	0%	0%	16%	6%	33%	0%	0%	0%	57%	12%	10%
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		113.7			113.7		14.3	14.3		14.3	14.3	
Effective Green, g (s)		113.7			113.7		14.3	14.3		14.3	14.3	
Actuated g/C Ratio		0.81			0.81		0.10	0.10		0.10	0.10	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		2597			2358		134	175		84	150	
v/s Ratio Prot								0.01			0.01	
v/s Ratio Perm		c0.66			0.24		0.02			c0.05		
v/c Ratio		0.81			0.30		0.16	0.12		0.48	0.10	
Uniform Delay, d1		7.2			3.3		57.4	57.1		59.3	57.0	
Progression Factor		0.36			0.86		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			0.3		0.6	0.3		4.2	0.3	
Delay (s)		3.8			3.1		58.0	57.4		63.5	57.3	
Level of Service		A			A		E	E		E	E	
Approach Delay (s)		3.8			3.1			57.6			59.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	2209	76	16	747	13	28	24	20	6	9	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		8.0			8.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.99		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		0.98	1.00		1.00	1.00	
Frt		1.00			1.00		1.00	0.93		1.00	0.87	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3205			3064		1740	1759		1693	1542	
Flt Permitted		0.95			0.84		0.70	1.00		0.73	1.00	
Satd. Flow (perm)		3053			2568		1283	1759		1298	1542	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	2209	76	16	747	13	28	24	20	6	9	78
RTOR Reduction (vph)	0	1	0	0	1	0	0	16	0	0	72	0
Lane Group Flow (vph)	0	2291	0	0	775	0	28	28	0	6	15	0
Confl. Peds. (#/hr)	3		2	2		3	8		2	2		8
Heavy Vehicles (%)	4%	4%	4%	9%	9%	9%	1%	1%	1%	5%	5%	5%
Bus Blockages (#/hr)	0	0	7	0	0	7	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		114.3			114.3		10.7	10.7		10.7	10.7	
Effective Green, g (s)		114.3			114.3		10.7	10.7		10.7	10.7	
Actuated g/C Ratio		0.82			0.82		0.08	0.08		0.08	0.08	
Clearance Time (s)		8.0			8.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		2493			2097		98	134		99	118	
v/s Ratio Prot								0.02			0.01	
v/s Ratio Perm		c0.75			0.30		c0.02			0.00		
v/c Ratio		0.92			0.37		0.29	0.21		0.06	0.13	
Uniform Delay, d1		9.4			3.4		61.0	60.7		60.0	60.3	
Progression Factor		0.57			1.08		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.0			0.5		1.6	0.8		0.3	0.5	
Delay (s)		10.4			4.1		62.7	61.5		60.2	60.8	
Level of Service		B			A		E	E		E	E	
Approach Delay (s)		10.4			4.1			61.9			60.7	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	2149	10	17	761	2	9	5	20	65	4	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	0.96	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3523		1745	3359		1321	1657		1745	1574	
Flt Permitted	0.36	1.00		0.06	1.00		0.74	1.00		0.74	1.00	
Satd. Flow (perm)	629	3523		109	3359		1034	1657		1361	1574	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	14	2149	10	17	761	2	9	5	20	65	4	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	17	0	0	15	0
Lane Group Flow (vph)	14	2159	0	17	763	0	9	8	0	65	6	0
Confl. Peds. (#/hr)	32		6	6		32	9		7	7		9
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	0%	0%	20%	0%	5%	0%	33%	0%	0%	1%	25%	0%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	114.6	114.6		114.6	114.6		13.4	13.4		13.4	13.4	
Effective Green, g (s)	114.6	114.6		114.6	114.6		13.4	13.4		13.4	13.4	
Actuated g/C Ratio	0.82	0.82		0.82	0.82		0.10	0.10		0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	515	2884		89	2750		99	159		130	151	
v/s Ratio Prot		c0.61			0.23			0.00			0.00	
v/s Ratio Perm	0.02			0.16			0.01			c0.05		
v/c Ratio	0.03	0.75		0.19	0.28		0.09	0.05		0.50	0.04	
Uniform Delay, d1	2.4	5.9		2.7	3.0		57.7	57.5		60.1	57.4	
Progression Factor	0.14	0.40		0.30	0.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6		4.5	0.2		0.4	0.1		3.0	0.1	
Delay (s)	0.4	3.0		5.3	1.6		58.1	57.6		63.1	57.5	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		2.9			1.7			57.8			61.8	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	4.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	1734	22	25	588	132	48	66	55	621	126	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0	6.0	7.0	7.0		5.0	7.0	
Lane Util. Factor	1.00	*0.97		1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1694	3316		1601	3076	1404	1691	1715		3330	1764	
Flt Permitted	0.34	1.00		0.07	1.00	1.00	0.65	1.00		0.95	1.00	
Satd. Flow (perm)	605	3316		111	3076	1404	1162	1715		3330	1764	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	1734	22	25	588	132	48	66	55	621	126	39
RTOR Reduction (vph)	0	0	0	0	0	45	0	9	0	0	9	0
Lane Group Flow (vph)	147	1756	0	25	588	87	48	112	0	621	156	0
Confl. Peds. (#/hr)			5	5			21		12	12		21
Heavy Vehicles (%)	3%	3%	3%	9%	9%	9%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt			Perm		Perm	Perm			Prot		
Protected Phases	5	2			6			4		3	8	
Permitted Phases	2			6		6	4					
Actuated Green, G (s)	74.5	74.5		60.7	60.7	60.7	18.6	18.6		28.9	52.5	
Effective Green, g (s)	74.5	74.5		60.7	60.7	60.7	18.6	18.6		28.9	52.5	
Actuated g/C Ratio	0.53	0.53		0.43	0.43	0.43	0.13	0.13		0.21	0.38	
Clearance Time (s)	3.0	6.0		6.0	6.0	6.0	7.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	406	1765		48	1334	609	154	228		687	662	
v/s Ratio Prot	0.03	c0.53			0.19			c0.07		c0.19	0.09	
v/s Ratio Perm	0.16			0.23		0.06	0.04					
v/c Ratio	0.36	0.99		0.52	0.44	0.14	0.31	0.49		0.90	0.24	
Uniform Delay, d1	17.6	32.6		29.0	27.8	23.9	54.9	56.3		54.2	30.0	
Progression Factor	0.71	0.77		1.01	1.07	1.34	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	18.6		34.3	1.0	0.5	1.2	1.7		15.3	0.2	
Delay (s)	13.0	43.7		63.7	30.6	32.5	56.1	58.0		69.5	30.2	
Level of Service	B	D		E	C	C	E	E		E	C	
Approach Delay (s)		41.3			32.1			57.4			61.2	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	44.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	5	1712	589	112	17	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.4	3.3	3.5	3.5
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.88	1.00	0.98
Flpb, ped/bikes	0.96	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1669	3530	3394	1252	1700	1558
Flt Permitted	0.43	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	755	3530	3394	1252	1700	1558
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1712	589	112	17	6
RTOR Reduction (vph)	0	0	0	17	0	6
Lane Group Flow (vph)	5	1712	589	95	17	0
Confl. Peds. (#/hr)	28			28	1	7
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	0%	4%	8%	5%	0%
Bus Blockages (#/hr)	0	0	0	5	0	0
Turn Type	Perm			Perm		Perm
Protected Phases		2	2		4	
Permitted Phases	2			2		4
Actuated Green, G (s)	115.0	115.0	115.0	115.0	11.0	11.0
Effective Green, g (s)	115.0	115.0	115.0	115.0	11.0	11.0
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.08	0.08
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	620	2900	2788	1028	134	122
v/s Ratio Prot		c0.49	0.17		c0.01	
v/s Ratio Perm	0.01			0.08		0.00
v/c Ratio	0.01	0.59	0.21	0.09	0.13	0.00
Uniform Delay, d1	2.2	4.3	2.7	2.4	60.0	59.5
Progression Factor	0.57	1.00	0.22	0.00	1.00	1.00
Incremental Delay, d2	0.0	0.8	0.2	0.2	0.4	0.0
Delay (s)	1.3	5.2	0.7	0.2	60.5	59.5
Level of Service	A	A	A	A	E	E
Approach Delay (s)		5.1	0.7		60.2	
Approach LOS		A	A		E	

Intersection Summary			
HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1258	15	17	474	18	12	2	16	92	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			0.99			0.97	
Frt		1.00			0.99			0.93			1.00	
Flt Protected		1.00			1.00			0.98			0.95	
Satd. Flow (prot)		3386			3240			1592			1758	
Flt Permitted		0.95			0.88			0.89			0.72	
Satd. Flow (perm)		3233			2867			1445			1317	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	1258	15	17	474	18	12	2	16	92	3	2
RTOR Reduction (vph)	0	0	0	0	1	0	0	14	0	0	1	0
Lane Group Flow (vph)	0	1274	0	0	508	0	0	16	0	0	96	0
Confl. Peds. (#/hr)	6		8	8		6	19		14	14		19
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	6%	6%	6%	1%	1%	1%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		112.3			112.3			15.7			15.7	
Effective Green, g (s)		112.3			112.3			15.7			15.7	
Actuated g/C Ratio		0.80			0.80			0.11			0.11	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2593			2300			162			148	
v/s Ratio Prot												
v/s Ratio Perm		c0.39			0.18			0.01			c0.07	
v/c Ratio		0.49			0.22			0.10			0.65	
Uniform Delay, d1		4.5			3.3			55.8			59.5	
Progression Factor		0.39			2.66			1.00			1.00	
Incremental Delay, d2		0.6			0.2			0.3			9.4	
Delay (s)		2.4			9.1			56.1			69.0	
Level of Service		A			A			E			E	
Approach Delay (s)		2.4			9.1			56.1			69.0	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1237	3	0	470	21	1	1	4	71	6	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.5	3.5
Total Lost time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00			0.99		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1640	3328			3336		1779	1691		1733	1568	
Flt Permitted	0.47	1.00			1.00		0.73	1.00		0.75	1.00	
Satd. Flow (perm)	816	3328			3336		1366	1691		1376	1568	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	1237	3	0	470	21	1	1	4	71	6	36
RTOR Reduction (vph)	0	0	0	0	1	0	0	4	0	0	32	0
Lane Group Flow (vph)	8	1240	0	0	490	0	1	1	0	71	10	0
Confl. Peds. (#/hr)	2		7	7		2	2					2
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	112.2	112.2			112.2		13.8	13.8		13.8	13.8	
Effective Green, g (s)	112.2	112.2			112.2		13.8	13.8		13.8	13.8	
Actuated g/C Ratio	0.80	0.80			0.80		0.10	0.10		0.10	0.10	
Clearance Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	654	2667			2674		135	167		136	155	
v/s Ratio Prot		c0.37			0.15			0.00			0.01	
v/s Ratio Perm	0.01						0.00			c0.05		
v/c Ratio	0.01	0.46			0.18		0.01	0.01		0.52	0.06	
Uniform Delay, d1	2.8	4.4			3.2		56.9	56.9		60.0	57.2	
Progression Factor	1.00	1.00			0.45		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6			0.1		0.0	0.0		3.6	0.2	
Delay (s)	2.8	5.0			1.6		56.9	56.9		63.5	57.4	
Level of Service	A	A			A		E	E		E	E	
Approach Delay (s)		5.0			1.6			56.9			61.3	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	1210	2	0	604	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.4	3.3	3.3	3.4	3.5	3.5
Total Lost time (s)	6.0			6.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3529			3394		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3529			3394		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1210	2	0	604	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1212	0	0	604	0	0
Heavy Vehicles (%)	0%	0%	0%	4%	2%	2%
Turn Type						
Protected Phases	2			6		
Permitted Phases						
Actuated Green, G (s)	85.6			85.6		
Effective Green, g (s)	85.6			85.6		
Actuated g/C Ratio	0.85			0.85		
Clearance Time (s)	6.0			6.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2991			2876		
v/s Ratio Prot	c0.34			0.18		
v/s Ratio Perm						
v/c Ratio	0.41			0.21		
Uniform Delay, d1	1.8			1.4		
Progression Factor	1.00			1.00		
Incremental Delay, d2	0.4			0.2		
Delay (s)	2.2			1.6		
Level of Service	A			A		
Approach Delay (s)	2.2			1.6	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	2.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	1185	8	3	492	55	16	5	14	78	16	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99			1.00	0.99
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00			0.99	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1652	3400	1407	1612	3305	1373	1745	1651			1730	1484
Flt Permitted	0.47	1.00	1.00	0.22	1.00	1.00	0.66	1.00			0.75	1.00
Satd. Flow (perm)	822	3400	1407	372	3305	1373	1216	1651			1350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	114	1185	8	3	492	55	16	5	14	78	16	104
RTOR Reduction (vph)	0	0	1	0	0	11	0	12	0	0	0	92
Lane Group Flow (vph)	114	1185	7	3	492	44	16	7	0	0	94	12
Confl. Peds. (#/hr)	3		4	4		3	2		5	5		2
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		4
Actuated Green, G (s)	111.6	111.6	111.6	111.6	111.6	111.6	16.4	16.4			16.4	16.4
Effective Green, g (s)	111.6	111.6	111.6	111.6	111.6	111.6	16.4	16.4			16.4	16.4
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80	0.12	0.12			0.12	0.12
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	655	2710	1122	297	2635	1094	142	193			158	174
v/s Ratio Prot		c0.35			0.15			0.00				
v/s Ratio Perm	0.14		0.01	0.01		0.03	0.01				c0.07	0.01
v/c Ratio	0.17	0.44	0.01	0.01	0.19	0.04	0.11	0.03			0.59	0.07
Uniform Delay, d1	3.3	4.4	2.9	2.9	3.4	3.0	55.3	54.8			58.6	55.0
Progression Factor	0.76	1.21	0.57	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	0.2	0.1	0.4	0.1			5.9	0.2
Delay (s)	3.1	5.8	1.7	3.0	3.5	3.0	55.6	54.9			64.5	55.2
Level of Service	A	A	A	A	A	A	E	D			E	E
Approach Delay (s)		5.6			3.5			55.2			59.6	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	1077	23	22	558	11	70	13	65	51	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	3419		1624	3322		1674	1550		1645	1565	
Flt Permitted	0.44	1.00		0.24	1.00		0.74	1.00		0.71	1.00	
Satd. Flow (perm)	757	3419		417	3322		1299	1550		1223	1565	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	19	1077	23	22	558	11	70	13	65	51	7	24
RTOR Reduction (vph)	0	1	0	0	1	0	0	58	0	0	21	0
Lane Group Flow (vph)	19	1099	0	22	568	0	70	20	0	51	10	0
Confl. Peds. (#/hr)	16		7	7		16	4		10	10		4
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	6%	6%	6%	7%	7%	7%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	113.3	113.3		113.3	113.3		14.7	14.7		14.7	14.7	
Effective Green, g (s)	113.3	113.3		113.3	113.3		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.10	0.10		0.10	0.10	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	613	2767		337	2688		136	163		128	164	
v/s Ratio Prot		c0.32			0.17			0.01			0.01	
v/s Ratio Perm	0.03			0.05			c0.05			0.04		
v/c Ratio	0.03	0.40		0.07	0.21		0.51	0.12		0.40	0.06	
Uniform Delay, d1	2.6	3.8		2.7	3.1		59.3	56.8		58.5	56.4	
Progression Factor	1.08	1.45		0.69	0.75		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.4	0.2		3.3	0.3		2.0	0.1	
Delay (s)	2.9	5.9		2.2	2.5		62.5	57.1		60.6	56.6	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		5.8			2.5			59.7			59.0	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	916	57	34	679	0	97	18	77	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			7.0	7.0			
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00	1.00			
Frt	1.00	0.99		1.00	1.00			1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00			
Satd. Flow (prot)	1617	3334		1626	3368			1691	1419			
Flt Permitted	0.39	1.00		0.28	1.00			0.76	1.00			
Satd. Flow (perm)	661	3334		476	3368			1338	1419			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	916	57	34	679	0	97	18	77	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	55	0	0	0
Lane Group Flow (vph)	2	971	0	34	679	0	0	115	22	0	0	0
Confl. Peds. (#/hr)	4		1	1		4			9	9		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	109.7	109.7		109.7	109.7			17.3	17.3			
Effective Green, g (s)	109.7	109.7		109.7	109.7			17.3	17.3			
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.12	0.12			
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0	7.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Grp Cap (vph)	518	2612		373	2639			165	175			
v/s Ratio Prot		c0.29			0.20							
v/s Ratio Perm	0.00			0.07				c0.09	0.02			
v/c Ratio	0.00	0.37		0.09	0.26			0.70	0.12			
Uniform Delay, d1	3.3	4.6		3.5	4.1			58.8	54.6			
Progression Factor	0.57	0.56		1.68	1.52			1.00	1.00			
Incremental Delay, d2	0.0	0.4		0.5	0.2			12.1	0.3			
Delay (s)	1.9	3.0		6.4	6.5			70.9	54.9			
Level of Service	A	A		A	A			E	D			
Approach Delay (s)		3.0			6.5			64.5			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	797	15	5	648	117	10	5	5	77	7	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	0.98
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1672	3553		1426	3173			1631			1754	1513
Flt Permitted	0.33	1.00		0.35	1.00			0.84			0.73	1.00
Satd. Flow (perm)	589	3553		518	3173			1408			1337	1513
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	157	797	15	5	648	117	10	5	5	77	7	146
RTOR Reduction (vph)	0	1	0	0	6	0	0	4	0	0	0	131
Lane Group Flow (vph)	157	811	0	5	759	0	0	16	0	0	84	15
Confl. Peds. (#/hr)	5		7	7		5	7		1	1		7
Heavy Vehicles (%)	3%	0%	6%	20%	4%	3%	10%	0%	20%	5%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Parking (#/hr)					0							
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	1	6			2			4			4	
Permitted Phases	6			2			4			4		4
Actuated Green, G (s)	113.3	113.3		102.2	102.2			14.7			14.7	14.7
Effective Green, g (s)	113.3	113.3		102.2	102.2			14.7			14.7	14.7
Actuated g/C Ratio	0.81	0.81		0.73	0.73			0.10			0.10	0.10
Clearance Time (s)	3.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	539	2875		378	2316			148			140	159
v/s Ratio Prot	0.02	c0.23			c0.24							
v/s Ratio Perm	0.22			0.01				0.01			c0.06	0.01
v/c Ratio	0.29	0.28		0.01	0.33			0.10			0.60	0.10
Uniform Delay, d1	3.1	3.3		5.2	6.7			56.7			59.8	56.6
Progression Factor	0.57	0.35		0.61	0.72			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1	0.4			0.3			6.8	0.3
Delay (s)	2.1	1.4		3.2	5.2			57.0			66.6	56.9
Level of Service	A	A		A	A			E			E	E
Approach Delay (s)		1.5			5.2			57.0			60.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	861	7	0	642	0	15	0	3	84	18	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		1.00			1.00			0.98			0.92	
Flt Protected		1.00			1.00			0.96			0.98	
Satd. Flow (prot)		3394			3433			1784			1650	
Flt Permitted		1.00			1.00			0.64			0.88	
Satd. Flow (perm)		3394			3433			1196			1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	861	7	0	642	0	15	0	3	84	18	157
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	41	0
Lane Group Flow (vph)	0	868	0	0	642	0	0	16	0	0	218	0
Confl. Peds. (#/hr)	5		7	7		5	10		6	6		10
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type				Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases				2			4			4		
Actuated Green, G (s)		103.5			103.5			24.5			24.5	
Effective Green, g (s)		103.5			103.5			24.5			24.5	
Actuated g/C Ratio		0.74			0.74			0.18			0.18	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2509			2538			209			260	
v/s Ratio Prot		c0.26			0.19							
v/s Ratio Perm								0.01			c0.15	
v/c Ratio		0.35			0.25			0.07			0.84	
Uniform Delay, d1		6.4			5.9			48.3			55.8	
Progression Factor		1.11			0.86			1.00			1.00	
Incremental Delay, d2		0.4			0.2			0.2			20.3	
Delay (s)		7.5			5.3			48.4			76.2	
Level of Service		A			A			D			E	
Approach Delay (s)		7.5			5.3			48.4			76.2	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	1067	15	8	739	3	13	1	8	19	1	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.99
Flpb, ped/bikes	0.98	1.00		1.00	1.00			1.00			0.99	1.00
Frt	1.00	1.00		1.00	1.00			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.95	1.00
Satd. Flow (prot)	1654	3380		1718	3397			1760			1822	1529
Flt Permitted	0.37	1.00		0.26	1.00			0.81			0.72	1.00
Satd. Flow (perm)	644	3380		461	3397			1463			1376	1529
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	1067	15	8	739	3	13	1	8	19	1	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	7	0	0	0	58
Lane Group Flow (vph)	39	1082	0	8	742	0	0	15	0	0	20	4
Confl. Peds. (#/hr)	15		5	5		15	1		4	4		1
Heavy Vehicles (%)	2%	0%	6%	0%	5%	0%	0%	0%	0%	0%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0										
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	118.3	118.3		118.3	118.3			9.7			9.7	9.7
Effective Green, g (s)	118.3	118.3		118.3	118.3			9.7			9.7	9.7
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.07			0.07	0.07
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	544	2856		390	2870			101			95	106
v/s Ratio Prot		c0.32			0.22							
v/s Ratio Perm	0.06			0.02				0.01			c0.01	0.00
v/c Ratio	0.07	0.38		0.02	0.26			0.14			0.21	0.04
Uniform Delay, d1	1.8	2.5		1.7	2.2			61.2			61.5	60.8
Progression Factor	1.02	2.25		0.60	0.53			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.4		0.1	0.2			0.7			1.1	0.2
Delay (s)	2.1	5.9		1.1	1.4			61.9			62.6	61.0
Level of Service	A	A		A	A			E			E	E
Approach Delay (s)		5.8			1.4			61.9			61.4	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	1115	20	26	860	9	72	11	104	24	6	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1622	3357		1655	3426		1695	1567		1755	1645	
Flt Permitted	0.32	1.00		0.23	1.00		0.74	1.00		0.62	1.00	
Satd. Flow (perm)	540	3357		404	3426		1318	1567		1151	1645	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	1115	20	26	860	9	72	11	104	24	6	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	79	0	0	19	0
Lane Group Flow (vph)	22	1135	0	26	869	0	72	36	0	24	9	0
Confl. Peds. (#/hr)	5		6	6		5	11		7	7		11
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	4%	4%	4%	1%	1%	1%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	109.6	109.6		109.6	109.6		16.4	16.4		16.4	16.4	
Effective Green, g (s)	109.6	109.6		109.6	109.6		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.12	0.12		0.12	0.12	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	2628		316	2682		154	184		135	193	
v/s Ratio Prot		c0.34			0.25			0.02			0.01	
v/s Ratio Perm	0.04			0.06			c0.05			0.02		
v/c Ratio	0.05	0.43		0.08	0.32		0.47	0.19		0.18	0.04	
Uniform Delay, d1	3.4	5.0		3.5	4.4		57.7	55.8		55.7	54.8	
Progression Factor	1.09	1.19		1.80	1.66		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		0.5	0.3		2.2	0.5		0.6	0.1	
Delay (s)	4.0	6.4		6.8	7.6		60.0	56.3		56.4	54.9	
Level of Service	A	A		A	A		E	E		E	D	
Approach Delay (s)		6.4			7.6			57.7			55.6	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	597	62	126	606	274	223	315	90	366	444	394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1591	3295	1341	1680	3548	1488	1569	3230	1391	1636	3349	1409
Flt Permitted	0.34	1.00	1.00	0.43	1.00	1.00	0.49	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	576	3295	1341	754	3548	1488	817	3230	1391	673	3349	1409
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	597	62	126	606	274	223	315	90	366	444	394
RTOR Reduction (vph)	0	0	19	0	0	154	0	0	77	0	0	255
Lane Group Flow (vph)	142	597	43	126	606	120	223	315	13	366	444	139
Confl. Peds. (#/hr)	12		30	30		12	20		3	3		20
Heavy Vehicles (%)	12%	12%	12%	4%	4%	4%	13%	13%	13%	9%	9%	9%
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		8
Actuated Green, G (s)	75.8	75.8	75.8	61.3	61.3	61.3	30.5	20.5	20.5	48.2	35.2	35.2
Effective Green, g (s)	75.8	75.8	75.8	61.3	61.3	61.3	30.5	20.5	20.5	48.2	35.2	35.2
Actuated g/C Ratio	0.54	0.54	0.54	0.44	0.44	0.44	0.22	0.15	0.15	0.34	0.25	0.25
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	395	1784	726	330	1554	652	232	473	204	402	842	354
v/s Ratio Prot	c0.03	0.18			c0.17		c0.07	0.10		c0.16	0.13	
v/s Ratio Perm	0.16		0.03	0.17		0.08	0.14		0.01	c0.15		0.10
v/c Ratio	0.36	0.33	0.06	0.38	0.39	0.18	0.96	0.67	0.06	0.91	0.53	0.39
Uniform Delay, d1	16.8	18.0	15.2	26.6	26.7	24.1	51.7	56.5	51.5	39.6	45.2	43.5
Progression Factor	0.85	0.89	0.77	0.83	0.84	1.19	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.2	3.2	0.7	0.6	48.0	3.5	0.1	24.3	0.6	0.7
Delay (s)	14.9	16.4	11.8	25.2	23.2	29.2	99.7	60.0	51.6	63.9	45.8	44.3
Level of Service	B	B	B	C	C	C	F	E	D	E	D	D
Approach Delay (s)		15.8			25.1			72.9			50.8	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	304	645	52	23	745	17	47	9	3	27	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1783	3690	1490	1777	3514	1444	1566	1697		1493	1512	
Flt Permitted	0.34	1.00	1.00	0.41	1.00	1.00	0.74	1.00		0.75	1.00	
Satd. Flow (perm)	645	3690	1490	761	3514	1444	1222	1697		1178	1512	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	304	645	52	23	745	17	47	9	3	27	0	24
RTOR Reduction (vph)	0	0	9	0	0	4	0	3	0	0	22	0
Lane Group Flow (vph)	304	645	43	23	745	13	47	9	0	27	2	0
Confl. Peds. (#/hr)	3		3	3		3			7	7		
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	0%	0%	1%	0%	5%	5%	14%	11%	0%	18%	0%	8%
Bus Blockages (#/hr)	0	0	7	0	0	5	0	0	0	0	0	0
Turn Type	pm+pt		Perm	Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	116.2	116.2	116.2	103.2	103.2	103.2	10.8	10.8		10.8	10.8	
Effective Green, g (s)	116.2	116.2	116.2	103.2	103.2	103.2	10.8	10.8		10.8	10.8	
Actuated g/C Ratio	0.83	0.83	0.83	0.74	0.74	0.74	0.08	0.08		0.08	0.08	
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	617	3063	1237	561	2590	1064	94	131		91	117	
v/s Ratio Prot	c0.04	0.17			0.21			0.01			0.00	
v/s Ratio Perm	c0.37		0.03	0.03		0.01	c0.04			0.02		
v/c Ratio	0.49	0.21	0.03	0.04	0.29	0.01	0.50	0.07		0.30	0.02	
Uniform Delay, d1	2.8	2.5	2.1	5.0	6.1	4.9	62.0	59.9		61.0	59.7	
Progression Factor	1.00	1.00	1.00	0.66	0.67	0.51	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2	0.1	0.1	0.2	0.0	4.1	0.2		1.8	0.1	
Delay (s)	3.4	2.6	2.1	3.4	4.4	2.5	66.1	60.2		62.8	59.7	
Level of Service	A	A	A	A	A	A	E	E		E	E	
Approach Delay (s)		2.8			4.3			64.9			61.4	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	1262	18	60	746	7	2	2	38	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.5	7.5			7.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1700	3506		1700	3510		1716	1584			1662	
Flt Permitted	0.37	1.00		0.20	1.00		0.87	1.00			1.00	
Satd. Flow (perm)	655	3506		351	3510		1571	1584			1662	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	1262	18	60	746	7	2	2	38	0	0	1
RTOR Reduction (vph)	0	1	0	0	0	0	0	35	0	0	1	0
Lane Group Flow (vph)	10	1279	0	60	753	0	2	5	0	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	4%	4%	4%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	47.1	47.1		47.1	47.1		4.6	4.6			4.6	
Effective Green, g (s)	47.1	47.1		47.1	47.1		4.6	4.6			4.6	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.07	0.07			0.07	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.5	7.5			7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	466	2494		250	2497		109	110			115	
v/s Ratio Prot		c0.36			0.21			c0.00			0.00	
v/s Ratio Perm	0.02			0.17			0.00					
v/c Ratio	0.02	0.51		0.24	0.30		0.02	0.04			0.00	
Uniform Delay, d1	2.8	4.3		3.3	3.5		28.7	28.7			28.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.2		0.5	0.1		0.1	0.2			0.0	
Delay (s)	2.8	4.5		3.8	3.6		28.8	28.9			28.7	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		4.5			3.6			28.9			28.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	4.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	14.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	875	131	47	460	173	22	211	116	416	248	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	8.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1716	3456		1623	3417	1401	1405	3476	1497	3267	3411	1521
Flt Permitted	0.48	1.00		0.22	1.00	1.00	0.60	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	863	3456		376	3417	1401	885	3476	1497	3267	3411	1521
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	875	131	47	460	173	22	211	116	416	248	136
RTOR Reduction (vph)	0	7	0	0	0	77	0	0	95	0	0	93
Lane Group Flow (vph)	127	999	0	47	460	96	22	211	21	416	248	43
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	4%	4%	8%	10%	8%	9%	27%	5%	5%	6%	7%	5%
Bus Blockages (#/hr)	0	0	3	0	0	8	0	0	0	0	0	0
Turn Type	Perm			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases		6			2			4		3	8	
Permitted Phases	6			2		2	4		4			8
Actuated Green, G (s)	66.7	66.7		66.7	66.7	66.7	12.6	12.6	12.6	20.7	38.3	38.3
Effective Green, g (s)	66.7	66.7		66.7	66.7	66.7	12.6	12.6	12.6	20.7	38.3	38.3
Actuated g/C Ratio	0.56	0.56		0.56	0.56	0.56	0.10	0.10	0.10	0.17	0.32	0.32
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	8.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	480	1921		209	1899	779	93	365	157	564	1089	485
v/s Ratio Prot		c0.29			0.13			c0.06		c0.13	0.07	
v/s Ratio Perm	0.15			0.13		0.07	0.02		0.01			0.03
v/c Ratio	0.26	0.52		0.22	0.24	0.12	0.24	0.58	0.13	0.74	0.23	0.09
Uniform Delay, d1	13.9	16.7		13.5	13.7	12.7	49.3	51.2	48.8	47.1	30.0	28.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	1.0		2.5	0.3	0.3	1.3	2.2	0.4	5.0	0.1	0.1
Delay (s)	15.2	17.7		16.0	14.0	13.0	50.6	53.4	49.1	52.1	30.1	28.7
Level of Service	B	B		B	B	B	D	D	D	D	C	C
Approach Delay (s)		17.4			13.9			51.8			41.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	55	10	555	19	523
v/c Ratio	0.48	0.23	0.02	0.22	0.03	0.20
Control Delay	29.0	16.4	5.6	4.9	5.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	16.4	5.6	4.9	5.8	4.7
Queue Length 50th (m)	10.0	2.6	0.3	10.7	0.6	9.8
Queue Length 95th (m)	21.9	10.8	m1.9	32.3	5.0	36.5
Internal Link Dist (m)	68.4	28.1		88.2		101.7
Turn Bay Length (m)			20.0		30.0	
Base Capacity (vph)	502	560	621	2566	565	2560
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	6	7	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.10	0.02	0.22	0.03	0.20

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	156	57	10	239	20	638	251	465	205
v/c Ratio	0.99	0.15	0.04	0.48	0.04	0.32	0.44	0.19	0.20
Control Delay	123.7	22.9	38.5	10.4	19.9	19.6	10.4	9.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	123.7	22.9	38.5	10.4	19.9	19.9	10.4	9.2	4.5
Queue Length 50th (m)	43.4	6.2	2.2	5.6	2.7	50.3	21.1	22.6	6.8
Queue Length 95th (m)	#71.0	16.1	6.4	25.4	9.5	84.6	41.7	38.6	20.2
Internal Link Dist (m)		80.0		53.5		101.7		124.1	
Turn Bay Length (m)	50.0				25.0		30.0		10.0
Base Capacity (vph)	221	541	394	618	503	1997	646	2434	1021
Starvation Cap Reductn	0	0	0	0	0	702	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.11	0.03	0.39	0.04	0.49	0.39	0.19	0.20

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	360	936	1	689	6	162	147
v/c Ratio	0.60	0.37	0.00	0.35	0.02	0.72	0.39
Control Delay	11.0	2.4	15.0	14.4	30.2	64.9	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	2.4	15.0	14.4	30.2	64.9	9.5
Queue Length 50th (m)	8.9	12.6	0.1	39.4	0.6	36.6	0.0
Queue Length 95th (m)	39.8	28.0	1.1	67.8	4.1	55.7	16.1
Internal Link Dist (m)		177.1		458.7	52.2	296.6	
Turn Bay Length (m)	98.0		45.0				
Base Capacity (vph)	618	2552	326	1983	450	408	558
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.37	0.00	0.35	0.01	0.40	0.26

Intersection Summary

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	21	1268	624	47	37
v/c Ratio	0.04	0.45	0.24	0.34	0.24
Control Delay	2.0	1.8	1.3	55.3	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	1.8	1.3	55.3	17.5
Queue Length 50th (m)	0.2	7.4	3.3	10.8	0.0
Queue Length 95th (m)	m1.2	24.3	5.5	20.6	9.4
Internal Link Dist (m)		142.1	396.6	199.0	
Turn Bay Length (m)	90.0				
Base Capacity (vph)	593	2818	2634	295	289
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.04	0.45	0.24	0.16	0.13

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	73	1543	2	559	12	55	65
v/c Ratio	0.12	0.57	0.01	0.22	0.09	0.43	0.32
Control Delay	4.8	14.7	2.5	1.7	40.0	59.4	19.4
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	15.1	2.5	1.7	40.0	59.4	19.4
Queue Length 50th (m)	6.4	147.7	0.0	4.2	2.0	12.6	2.0
Queue Length 95th (m)	m7.5	204.4	m0.3	11.5	7.4	23.9	14.1
Internal Link Dist (m)		242.7		212.7	87.2		230.0
Turn Bay Length (m)	130.0		25.0			35.6	
Base Capacity (vph)	617	2688	190	2559	263	250	336
Starvation Cap Reductn	0	557	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.72	0.01	0.22	0.05	0.22	0.19

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	8	1530	51	18	544	43	30
v/c Ratio	0.01	0.57	0.05	0.09	0.21	0.36	0.18
Control Delay	1.1	3.6	0.5	11.1	7.3	56.8	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	3.6	0.5	11.1	7.3	56.8	28.3
Queue Length 50th (m)	0.2	61.5	0.6	0.7	11.9	9.8	2.7
Queue Length 95th (m)	m0.2	9.9	m0.1	8.1	58.5	19.3	10.7
Internal Link Dist (m)		358.7			242.7		225.8
Turn Bay Length (m)	20.0		20.0	40.0			
Base Capacity (vph)	620	2667	1109	194	2617	254	325
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.57	0.05	0.09	0.21	0.17	0.09

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	1368	112	43	420	8	23	56	15	16
v/c Ratio	0.04	0.53	0.10	0.20	0.17	0.01	0.15	0.27	0.11	0.08
Control Delay	4.8	5.8	3.0	7.7	1.8	1.0	45.3	27.0	43.7	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	5.8	3.0	7.7	1.8	1.0	45.3	27.0	43.7	31.7
Queue Length 50th (m)	0.8	25.3	1.8	0.4	1.8	0.0	5.3	5.9	3.4	2.3
Queue Length 95th (m)	m4.4	67.0	10.8	8.1	15.4	0.3	10.3	14.3	7.8	7.0
Internal Link Dist (m)		211.5			358.7			239.0		192.7
Turn Bay Length (m)	15.0		20.0	20.0		20.0			21.1	
Base Capacity (vph)	680	2588	1096	220	2448	1038	484	590	453	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.53	0.10	0.20	0.17	0.01	0.05	0.09	0.03	0.03

Intersection Summary

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

Lane Group	EBL	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	420	1225	480	127	128	245
v/c Ratio	0.58	0.48	0.27	0.59	0.58	0.43
Control Delay	8.3	7.5	17.2	58.5	57.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	7.5	17.2	58.5	57.9	5.3
Queue Length 50th (m)	22.2	48.3	27.5	30.4	30.6	0.0
Queue Length 95th (m)	56.6	96.3	47.3	44.6	44.7	14.2
Internal Link Dist (m)		72.9	117.3		258.4	
Turn Bay Length (m)	20.0			59.0		
Base Capacity (vph)	743	2545	1761	240	245	601
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.48	0.27	0.53	0.52	0.41

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	1544	10	29	801	7	37	35	114
v/c Ratio	0.07	0.54	0.01	0.14	0.30	0.09	0.22	0.32	0.53
Control Delay	2.7	3.5	2.1	5.2	3.4	56.7	27.0	65.0	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.7	3.5	2.1	5.2	3.4	56.7	27.0	65.0	25.9
Queue Length 50th (m)	0.9	35.0	0.2	1.1	17.6	1.9	2.4	9.5	6.7
Queue Length 95th (m)	m3.4	57.1	m0.8	5.8	43.2	6.2	12.2	18.7	23.4
Internal Link Dist (m)		206.4			146.8		32.4		230.0
Turn Bay Length (m)	30.0		20.0	48.0		15.0		13.5	
Base Capacity (vph)	503	2840	1161	208	2715	197	360	270	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.54	0.01	0.14	0.30	0.04	0.10	0.13	0.29

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	1286	15	601	44	27	112	18
v/c Ratio	0.02	0.50	0.06	0.24	0.26	0.12	0.69	0.08
Control Delay	0.4	1.3	4.7	4.2	57.0	23.3	78.8	33.9
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	1.4	4.7	4.2	57.0	23.3	78.8	33.9
Queue Length 50th (m)	0.1	18.5	0.8	18.5	11.2	1.2	30.2	2.2
Queue Length 95th (m)	m0.0	0.5	3.0	27.8	21.9	9.7	48.0	9.2
Internal Link Dist (m)		201.3		159.0		182.5		150.8
Turn Bay Length (m)	17.3		15.5					
Base Capacity (vph)	600	2597	270	2539	285	357	273	359
Starvation Cap Reductn	0	257	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.55	0.06	0.24	0.15	0.08	0.41	0.05

Intersection Summary

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

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1512	8	591	29	14
v/c Ratio	0.58	0.04	0.23	0.21	0.11
Control Delay	2.1	3.2	2.7	61.0	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	3.2	2.7	61.0	23.9
Queue Length 50th (m)	7.1	0.2	10.1	7.9	0.0
Queue Length 95th (m)	11.4	1.8	23.8	16.2	6.4
Internal Link Dist (m)	223.1		201.3	159.6	
Turn Bay Length (m)		13.4			
Base Capacity (vph)	2621	215	2562	337	306
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.04	0.23	0.09	0.05

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1324	671	29	18
v/c Ratio	0.51	0.26	0.22	0.13
Control Delay	4.3	4.4	47.6	34.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.3	4.4	47.6	34.2
Queue Length 50th (m)	29.0	12.8	5.7	1.9
Queue Length 95th (m)	33.6	45.7	14.8	9.2
Internal Link Dist (m)	216.4	223.1	189.9	153.8
Turn Bay Length (m)				
Base Capacity (vph)	2603	2551	250	255
Starvation Cap Reductn	154	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.26	0.12	0.07

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	327	1126	5	36	605	174	6	79	194	83	224
v/c Ratio	0.56	0.45	0.00	0.14	0.31	0.20	0.03	0.23	0.80	0.24	0.39
Control Delay	4.6	3.9	1.6	20.0	17.3	8.0	42.3	41.2	85.7	56.8	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1
Total Delay	4.6	3.9	1.6	20.0	17.3	8.0	42.3	41.2	86.0	56.8	5.2
Queue Length 50th (m)	16.4	37.7	0.1	4.1	44.2	6.4	1.3	15.8	55.9	22.3	16.9
Queue Length 95th (m)	m9.8	30.6	m0.1	8.9	55.5	13.9	5.0	29.2	82.0	33.2	2.4
Internal Link Dist (m)		55.5			216.4			160.5		88.2	
Turn Bay Length (m)	24.5		24.5	28.8		26.1	26.1		30.0		
Base Capacity (vph)	625	2527	1053	250	1981	869	270	441	308	449	629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	8	0	63
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.45	0.00	0.14	0.31	0.20	0.02	0.18	0.65	0.18	0.40

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2106	699	22	36	40	75
v/c Ratio	0.81	0.30	0.16	0.19	0.48	0.36
Control Delay	4.4	3.5	57.0	35.8	75.7	19.2
Queue Delay	1.5	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	3.5	57.0	35.8	75.7	19.2
Queue Length 50th (m)	1.3	18.6	5.8	5.0	10.8	2.1
Queue Length 95th (m)	0.9	30.2	13.7	14.8	22.4	16.2
Internal Link Dist (m)	81.6	108.7		86.4		94.4
Turn Bay Length (m)						
Base Capacity (vph)	2595	2357	243	332	152	328
Starvation Cap Reductn	296	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.30	0.09	0.11	0.26	0.23

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2292	776	28	44	6	87
v/c Ratio	0.92	0.37	0.29	0.29	0.06	0.46
Control Delay	11.9	4.5	66.7	45.2	58.2	22.7
Queue Delay	0.5	0.2	0.0	0.0	0.0	0.0
Total Delay	12.4	4.7	66.7	45.2	58.2	22.7
Queue Length 50th (m)	257.3	12.2	7.6	7.3	1.6	2.4
Queue Length 95th (m)	#392.8	36.7	16.6	18.2	5.7	18.1
Internal Link Dist (m)	352.7	81.6		124.7		72.1
Turn Bay Length (m)			8.3			
Base Capacity (vph)	2493	2096	220	316	222	329
Starvation Cap Reductn	0	509	0	0	0	0
Spillback Cap Reductn	39	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.49	0.13	0.14	0.03	0.26

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	2159	17	763	9	25	65	21
v/c Ratio	0.03	0.75	0.19	0.28	0.09	0.14	0.50	0.13
Control Delay	0.5	3.4	6.1	1.8	55.9	27.2	71.4	26.5
Queue Delay	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.5	5.9	6.1	1.8	55.9	27.2	71.4	26.5
Queue Length 50th (m)	0.1	5.6	0.4	9.1	2.3	1.6	17.6	1.1
Queue Length 95th (m)	m0.1	m6.6	m1.4	13.4	7.5	9.9	30.6	8.6
Internal Link Dist (m)		159.2		352.7		101.4		82.5
Turn Bay Length (m)	8.6		10.2		18.0		40.0	
Base Capacity (vph)	517	2883	88	2751	192	323	253	306
Starvation Cap Reductn	0	571	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.93	0.19	0.28	0.05	0.08	0.26	0.07

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	147	1756	25	588	132	48	121	621	165
v/c Ratio	0.35	0.99	0.52	0.44	0.20	0.31	0.51	0.90	0.25
Control Delay	14.6	45.3	77.4	33.6	18.3	56.5	57.1	71.7	26.3
Queue Delay	0.0	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	54.1	77.4	33.6	18.3	56.5	57.1	71.7	26.3
Queue Length 50th (m)	10.9	235.6	3.6	45.7	8.7	12.7	30.0	86.3	29.3
Queue Length 95th (m)	17.2	#342.2	#24.2	81.7	28.2	22.9	45.3	#115.2	39.3
Internal Link Dist (m)		273.8		159.2			168.4		175.9
Turn Bay Length (m)	28.8		53.3		28.9	15.0		58.1	
Base Capacity (vph)	423	1765	48	1333	653	266	400	714	853
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	54	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	1.03	0.52	0.44	0.20	0.18	0.30	0.87	0.19

Intersection Summary

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

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	5	1712	589	112	17	6
v/c Ratio	0.01	0.59	0.21	0.11	0.13	0.05
Control Delay	2.0	5.9	0.8	0.2	59.1	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	5.9	0.8	0.2	59.1	30.7
Queue Length 50th (m)	0.1	23.1	3.8	0.0	4.6	0.0
Queue Length 95th (m)	m0.5	173.5	5.2	0.0	11.1	4.0
Internal Link Dist (m)		191.5	273.8		73.1	
Turn Bay Length (m)	31.2			15.2		
Base Capacity (vph)	622	2899	2788	1045	328	305
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.59	0.21	0.11	0.05	0.02

Intersection Summary

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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1274	509	30	97
v/c Ratio	0.49	0.22	0.17	0.66
Control Delay	2.5	9.9	33.5	78.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.5	9.9	33.5	78.2
Queue Length 50th (m)	11.0	59.3	3.5	25.9
Queue Length 95th (m)	12.2	76.1	12.7	43.0
Internal Link Dist (m)	340.0	183.0	287.5	286.5
Turn Bay Length (m)				
Base Capacity (vph)	2595	2302	271	236
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.22	0.11	0.41

Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	8	1240	491	1	5	71	42
v/c Ratio	0.01	0.46	0.18	0.01	0.03	0.53	0.22
Control Delay	4.0	5.5	1.8	52.0	34.8	72.3	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	5.5	1.8	52.0	34.8	72.3	22.2
Queue Length 50th (m)	0.4	45.2	6.3	0.3	0.3	19.2	1.6
Queue Length 95th (m)	2.0	81.4	11.7	1.9	4.3	32.8	12.1
Internal Link Dist (m)		246.9	340.0		61.8		113.2
Turn Bay Length (m)	30.0			6.0		6.7	
Base Capacity (vph)	654	2670	2678	283	353	285	353
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.46	0.18	0.00	0.01	0.25	0.12

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	1212	604
v/c Ratio	0.36	0.19
Control Delay	2.1	1.6
Queue Delay	0.0	0.0
Total Delay	2.1	1.6
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	59.3	25.0
Internal Link Dist (m)	50.1	245.2
Turn Bay Length (m)		
Base Capacity (vph)	3327	3199
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.36	0.19

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	114	1185	8	3	492	55	16	19	94	104
v/c Ratio	0.17	0.44	0.01	0.01	0.19	0.05	0.11	0.09	0.59	0.39
Control Delay	3.9	6.7	2.1	4.7	4.1	1.3	52.9	26.9	72.4	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	6.7	2.1	4.7	4.1	1.3	52.9	26.9	72.4	13.1
Queue Length 50th (m)	5.6	68.3	0.1	0.1	13.5	0.0	4.1	1.3	25.4	0.0
Queue Length 95th (m)	11.4	141.8	m0.4	1.1	28.2	3.7	10.2	8.2	40.1	15.5
Internal Link Dist (m)		652.4			611.6			74.7	463.8	
Turn Bay Length (m)	50.0		15.0	50.0		20.0				35.0
Base Capacity (vph)	654	2711	1122	297	2635	1106	304	423	337	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.44	0.01	0.01	0.19	0.05	0.05	0.04	0.28	0.23

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	1100	22	569	70	78	51	31
v/c Ratio	0.03	0.40	0.07	0.21	0.51	0.35	0.40	0.17
Control Delay	4.4	6.8	3.2	2.9	70.2	20.3	64.8	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	6.8	3.2	2.9	70.2	20.3	64.8	24.8
Queue Length 50th (m)	1.5	54.5	0.4	5.2	18.9	3.4	13.6	1.8
Queue Length 95th (m)	4.7	69.2	2.2	25.2	31.5	17.1	24.6	10.5
Internal Link Dist (m)		256.4		386.3		255.5		146.0
Turn Bay Length (m)	40.0		50.0		15.0		15.0	
Base Capacity (vph)	613	2766	338	2688	306	415	288	387
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.40	0.07	0.21	0.23	0.19	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	2	973	34	679	115	77
v/c Ratio	0.00	0.37	0.09	0.26	0.70	0.33
Control Delay	2.5	3.2	8.4	7.2	79.3	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	3.2	8.4	7.2	79.3	20.1
Queue Length 50th (m)	0.1	18.0	1.8	21.6	31.0	3.5
Queue Length 95th (m)	m0.3	21.5	10.5	64.5	49.4	17.5
Internal Link Dist (m)		225.8		420.2	316.2	
Turn Bay Length (m)	15.0		30.0			15.0
Base Capacity (vph)	518	2614	373	2639	258	325
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.37	0.09	0.26	0.45	0.24

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	157	812	5	765	20	84	146
v/c Ratio	0.28	0.28	0.01	0.33	0.13	0.60	0.51
Control Delay	2.8	1.5	4.6	5.6	45.4	76.0	14.2
Queue Delay	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	1.9	4.6	5.6	45.4	76.0	14.2
Queue Length 50th (m)	2.0	7.6	0.4	31.8	3.9	22.7	0.0
Queue Length 95th (m)	m4.4	11.1	m0.9	27.7	11.1	37.8	18.7
Internal Link Dist (m)		47.4		225.8	76.5	225.2	
Turn Bay Length (m)	15.0		25.0				60.0
Base Capacity (vph)	604	2876	378	2323	356	334	488
Starvation Cap Reductn	181	1384	0	0	0	0	0
Spillback Cap Reductn	0	0	0	24	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.54	0.01	0.33	0.06	0.25	0.30

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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	868	642	18	259
v/c Ratio	0.35	0.25	0.08	0.86
Control Delay	8.1	5.7	40.7	70.4
Queue Delay	0.0	0.4	0.0	0.0
Total Delay	8.1	6.1	40.7	70.4
Queue Length 50th (m)	87.5	37.2	3.5	57.1
Queue Length 95th (m)	7.7	29.1	10.3	86.9
Internal Link Dist (m)	219.5	47.4	341.2	18.8
Turn Bay Length (m)				
Base Capacity (vph)	2509	2537	259	357
Starvation Cap Reductn	0	1268	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.51	0.07	0.73

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	39	1082	8	742	22	20	62
v/c Ratio	0.07	0.37	0.02	0.25	0.18	0.18	0.34
Control Delay	3.4	7.2	2.0	1.6	44.0	60.7	17.6
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	7.4	2.0	1.6	44.0	60.7	17.6
Queue Length 50th (m)	0.0	96.7	0.2	9.3	3.8	5.4	0.0
Queue Length 95th (m)	4.9	137.9	m1.1	19.6	11.3	12.3	12.8
Internal Link Dist (m)		199.8		219.5	58.3	80.4	
Turn Bay Length (m)	25.0		25.0				
Base Capacity (vph)	557	2915	398	2929	320	295	376
Starvation Cap Reductn	0	700	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.02	0.25	0.07	0.07	0.16

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	1135	26	869	72	115	24	28
v/c Ratio	0.05	0.43	0.08	0.32	0.46	0.44	0.18	0.13
Control Delay	6.6	7.9	11.4	9.4	64.5	20.1	53.7	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	7.9	11.4	9.4	64.5	20.1	53.7	22.4
Queue Length 50th (m)	1.4	42.5	1.7	36.1	19.5	6.5	6.3	1.5
Queue Length 95th (m)	m4.0	144.0	8.8	80.2	29.9	21.0	13.0	9.2
Internal Link Dist (m)		207.1		199.8		173.7		112.3
Turn Bay Length (m)	35.0		40.0		50.0		50.0	
Base Capacity (vph)	423	2627	316	2681	395	533	345	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.43	0.08	0.32	0.18	0.22	0.07	0.06

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	597	62	126	606	274	223	315	90	366	444	394
v/c Ratio	0.34	0.33	0.08	0.38	0.39	0.34	0.86	0.67	0.32	0.86	0.53	0.65
Control Delay	15.2	17.3	6.3	28.8	24.9	5.3	67.1	63.0	12.0	54.7	46.9	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	17.3	6.3	28.8	24.9	5.3	67.1	63.0	12.0	54.7	46.9	12.3
Queue Length 50th (m)	13.7	34.0	1.5	20.4	51.4	8.6	44.9	44.5	0.0	81.6	56.7	11.9
Queue Length 95th (m)	22.0	65.6	6.1	29.5	57.3	13.7	57.7	54.7	14.1	98.3	65.4	40.8
Internal Link Dist (m)		401.7			97.9			650.8			510.4	
Turn Bay Length (m)	105.0		30.0	65.0		100.0	50.0		100.0	60.0		60.0
Base Capacity (vph)	443	1786	746	330	1555	806	260	923	462	428	1316	760
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.33	0.08	0.38	0.39	0.34	0.86	0.34	0.19	0.86	0.34	0.52

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	304	645	52	23	745	17	47	12	27	24
v/c Ratio	0.48	0.21	0.04	0.04	0.28	0.02	0.43	0.08	0.26	0.05
Control Delay	5.0	3.0	1.1	5.2	5.1	1.9	70.7	46.2	63.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	3.0	1.1	5.2	5.1	1.9	70.7	46.2	63.0	0.2
Queue Length 50th (m)	11.4	15.3	0.0	1.4	26.2	0.2	12.7	2.4	7.2	0.0
Queue Length 95th (m)	28.7	31.4	3.1	m3.6	m41.7	m1.3	24.1	8.2	15.7	0.0
Internal Link Dist (m)		384.5			401.7			130.8		103.0
Turn Bay Length (m)	30.0		30.0	15.0						
Base Capacity (vph)	751	3130	1272	568	2624	1082	245	342	236	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.21	0.04	0.04	0.28	0.02	0.19	0.04	0.11	0.04

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	10	1280	60	753	2	40	1
v/c Ratio	0.02	0.46	0.22	0.27	0.01	0.17	0.00
Control Delay	4.1	5.0	6.8	3.8	25.5	12.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	5.0	6.8	3.8	25.5	12.4	0.0
Queue Length 50th (m)	0.4	37.0	2.5	17.5	0.3	0.3	0.0
Queue Length 95th (m)	1.6	50.0	7.9	24.6	2.0	8.0	0.0
Internal Link Dist (m)		1201.8		384.5		397.9	57.0
Turn Bay Length (m)	15.0		40.0				
Base Capacity (vph)	598	3199	320	3203	742	768	887
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.40	0.19	0.24	0.00	0.05	0.00

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	1006	47	460	173	22	211	116	416	248	136
v/c Ratio	0.26	0.52	0.22	0.24	0.20	0.24	0.58	0.46	0.74	0.23	0.24
Control Delay	17.5	18.6	19.7	15.1	3.0	54.5	57.3	17.3	55.0	29.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	18.6	19.7	15.1	3.0	54.5	57.3	17.3	55.0	29.4	5.1
Queue Length 50th (m)	14.9	73.3	5.4	27.9	0.0	4.8	25.3	2.2	48.4	22.5	0.0
Queue Length 95th (m)	32.0	107.5	15.7	44.2	11.4	12.9	36.7	18.9	61.9	29.1	12.1
Internal Link Dist (m)		479.0		1201.8			922.2			534.5	
Turn Bay Length (m)	80.0		55.0		190.0	70.0		40.0	45.0		55.0
Base Capacity (vph)	480	1927	209	1900	855	162	637	361	1007	1819	875
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.52	0.22	0.24	0.20	0.14	0.33	0.32	0.41	0.14	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	5	55	20	6	44	15	599	18	25	608	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			1.00		0.98	1.00		0.94	1.00	
Frt		0.95			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1701			1652		1747	3483		1619	3468	
Flt Permitted		0.77			0.87		0.40	1.00		0.42	1.00	
Satd. Flow (perm)		1346			1458		739	3483		711	3468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	102	5	55	20	6	44	15	599	18	25	608	42
RTOR Reduction (vph)	0	21	0	0	37	0	0	2	0	0	4	0
Lane Group Flow (vph)	0	141	0	0	33	0	15	615	0	25	646	0
Confl. Peds. (#/hr)	23		18	18		23	17		43	43		17
Confl. Bikes (#/hr)						1			2			2
Heavy Vehicles (%)	2%	0%	0%	5%	0%	0%	0%	4%	0%	4%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	1	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		15.8			14.8		72.2	72.2		72.2	72.2	
Effective Green, g (s)		15.8			14.8		72.2	72.2		72.2	72.2	
Actuated g/C Ratio		0.16			0.15		0.72	0.72		0.72	0.72	
Clearance Time (s)		6.0			7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		213			216		534	2515		513	2504	
v/s Ratio Prot								0.18			c0.19	
v/s Ratio Perm		c0.10			0.02		0.02			0.04		
v/c Ratio		0.66			0.15		0.03	0.24		0.05	0.26	
Uniform Delay, d1		39.6			37.1		3.9	4.7		4.0	4.7	
Progression Factor		1.00			1.00		1.26	1.11		0.11	0.25	
Incremental Delay, d2		7.5			0.3		0.1	0.2		0.2	0.2	
Delay (s)		47.1			37.4		5.1	5.4		0.6	1.4	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		47.1			37.4			5.4			1.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	164	37	36	14	34	175	15	677	22	130	697	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.95		1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	0.97	1.00		0.98	1.00		0.98	1.00		0.98	1.00	1.00
Frt	1.00	0.93		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1720	1748		1749	1604		1750	3484		1735	3544	1464
Flt Permitted	0.52	1.00		0.71	1.00		0.38	1.00		0.37	1.00	1.00
Satd. Flow (perm)	944	1748		1306	1604		692	3484		685	3544	1464
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	37	36	14	34	175	15	677	22	130	697	264
RTOR Reduction (vph)	0	29	0	0	130	0	0	2	0	0	0	41
Lane Group Flow (vph)	164	44	0	14	79	0	15	697	0	130	697	223
Confl. Peds. (#/hr)	31		18	18		32	24		22	22		24
Confl. Bikes (#/hr)			1			3			3			1
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	4%	5%	1%	3%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		2
Actuated Green, G (s)	20.5	20.5		20.5	20.5		65.5	65.5		65.5	65.5	65.5
Effective Green, g (s)	20.5	20.5		20.5	20.5		65.5	65.5		65.5	65.5	65.5
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.66	0.66		0.66	0.66	0.66
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	194	358		268	329		453	2282		449	2321	959
v/s Ratio Prot		0.03			0.05			c0.20			0.20	
v/s Ratio Perm	c0.17			0.01			0.02			0.19		0.15
v/c Ratio	0.85	0.12		0.05	0.24		0.03	0.31		0.29	0.30	0.23
Uniform Delay, d1	38.2	32.4		31.9	33.2		6.1	7.4		7.3	7.4	7.0
Progression Factor	1.00	1.00		1.00	1.00		0.81	0.85		1.00	1.00	1.00
Incremental Delay, d2	27.1	0.2		0.1	0.4		0.1	0.3		1.6	0.3	0.6
Delay (s)	65.4	32.6		32.0	33.6		5.0	6.7		9.0	7.7	7.6
Level of Service	E	C		C	C		A	A		A	A	A
Approach Delay (s)		55.3			33.5			6.6			7.8	
Approach LOS		E			C			A			A	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	328	723	0	0	1033	191	0	3	2	181	1	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	7.0			7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			0.99			1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	1.00			0.98			0.95			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			0.95	1.00
Satd. Flow (prot)	1728	3461			3353			1817			1830	1511
Flt Permitted	0.11	1.00			1.00			1.00			0.72	1.00
Satd. Flow (perm)	201	3461			3353			1817			1392	1511
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	328	723	0	0	1033	191	0	3	2	181	1	282
RTOR Reduction (vph)	0	0	0	0	13	0	0	2	0	0	0	184
Lane Group Flow (vph)	328	723	0	0	1211	0	0	3	0	0	182	98
Confl. Peds. (#/hr)	11					11	15					15
Confl. Bikes (#/hr)			7			5						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	0	0	0	0
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	84.8	84.8			57.0			21.2			21.2	21.2
Effective Green, g (s)	84.8	84.8			57.0			21.2			21.2	21.2
Actuated g/C Ratio	0.71	0.71			0.48			0.18			0.18	0.18
Clearance Time (s)	3.0	7.0			7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	458	2446			1593			321			246	267
v/s Ratio Prot	c0.15	0.21			c0.36			0.00				
v/s Ratio Perm	0.36										c0.13	0.07
v/c Ratio	0.72	0.30			0.76			0.01			0.74	0.37
Uniform Delay, d1	25.9	6.5			25.9			40.7			46.8	43.5
Progression Factor	1.16	0.54			1.00			1.00			1.00	1.00
Incremental Delay, d2	5.2	0.3			3.5			0.0			11.1	0.9
Delay (s)	35.3	3.9			29.4			40.8			57.9	44.4
Level of Service	D	A			C			D			E	D
Approach Delay (s)		13.7			29.4			40.8			49.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
107: Lakeshore Rd E & Haig Boulevard

Timing Plan: PM
14/10/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	843	1289	44	33	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.4	3.3	3.5	3.7
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.95
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1663	3394	3400		1566	1367
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	332	3394	3400		1566	1367
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	843	1289	44	33	47
RTOR Reduction (vph)	0	0	1	0	0	43
Lane Group Flow (vph)	45	843	1332	0	33	4
Confl. Peds. (#/hr)	19			19		20
Heavy Vehicles (%)	4%	4%	3%	3%	14%	14%
Turn Type	Perm					Perm
Protected Phases		2	2		4	
Permitted Phases	2					4
Actuated Green, G (s)	98.8	98.8	98.8		9.2	9.2
Effective Green, g (s)	98.8	98.8	98.8		9.2	9.2
Actuated g/C Ratio	0.82	0.82	0.82		0.08	0.08
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	273	2794	2799		120	105
v/s Ratio Prot		0.25	c0.39		c0.02	
v/s Ratio Perm	0.14					0.00
v/c Ratio	0.16	0.30	0.48		0.28	0.03
Uniform Delay, d1	2.2	2.5	3.1		52.3	51.3
Progression Factor	0.48	0.47	0.27		1.00	1.00
Incremental Delay, d2	1.3	0.3	0.5		1.2	0.1
Delay (s)	2.3	1.5	1.3		53.5	51.4
Level of Service	A	A	A		D	D
Approach Delay (s)		1.5	1.3		52.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	3.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	662	2	86	1448	53	2	0	3	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99		0.99	1.00	
Frt	1.00	1.00		1.00	0.99			0.92		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1676	3392		1482	3024			1692		1599	1471	
Flt Permitted	0.15	1.00		0.40	1.00			0.88		0.75	1.00	
Satd. Flow (perm)	266	3392		623	3024			1522		1270	1471	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	662	2	86	1448	53	2	0	3	28	8	31
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	0	0	28	0
Lane Group Flow (vph)	28	664	0	86	1500	0	0	2	0	28	11	0
Confl. Peds. (#/hr)	3		11	11		3	18		3	3		18
Heavy Vehicles (%)	4%	4%	4%	16%	16%	16%	0%	0%	0%	11%	11%	11%
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	96.3	96.3		96.3	96.3			10.7		10.7	10.7	
Effective Green, g (s)	96.3	96.3		96.3	96.3			10.7		10.7	10.7	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.09		0.09	0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	213	2722		500	2427			136		113	131	
v/s Ratio Prot		0.20			c0.50						0.01	
v/s Ratio Perm	0.11			0.14				0.00		c0.02		
v/c Ratio	0.13	0.24		0.17	0.62			0.02		0.25	0.08	
Uniform Delay, d1	2.6	2.9		2.7	4.6			49.9		50.9	50.1	
Progression Factor	0.49	0.84		0.60	0.48			1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2		0.7	1.1			0.0		1.2	0.3	
Delay (s)	2.5	2.7		2.3	3.4			49.9		52.1	50.4	
Level of Service	A	A		A	A			D		D	D	
Approach Delay (s)		2.7			3.3			49.9			51.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	4.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	655	27	23	1433	7	78	11	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0				
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00				
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	0.98				
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		0.98	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.89				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	1691	3427	1419	1693	3457		1603	1543				
Flt Permitted	0.16	1.00	1.00	0.40	1.00		0.76	1.00				
Satd. Flow (perm)	281	3427	1419	716	3457		1277	1543				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	655	27	23	1433	7	78	11	28	0	0	0
RTOR Reduction (vph)	0	0	6	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	3	655	21	23	1440	0	78	14	0	0	0	0
Confl. Peds. (#/hr)	7		8	8		7	13		9	9		13
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)	93.4	93.4	93.4	93.4	93.4		13.6	13.6				
Effective Green, g (s)	93.4	93.4	93.4	93.4	93.4		13.6	13.6				
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78		0.11	0.11				
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		7.0	7.0				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	219	2667	1104	557	2691		145	175				
v/s Ratio Prot		0.19			c0.42			0.01				
v/s Ratio Perm	0.01		0.01	0.03			c0.06					
v/c Ratio	0.01	0.25	0.02	0.04	0.54		0.54	0.08				
Uniform Delay, d1	3.0	3.6	3.0	3.0	5.1		50.2	47.6				
Progression Factor	2.07	2.17	3.63	0.47	0.30		1.00	1.00				
Incremental Delay, d2	0.1	0.2	0.0	0.1	0.6		3.8	0.2				
Delay (s)	6.3	8.1	10.9	1.5	2.2		54.0	47.8				
Level of Service	A	A	B	A	A		D	D				
Approach Delay (s)		8.2			2.1			52.0			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	674	23	30	1421	28	109	37	33	10	4	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0		8.0	8.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3330	1386	1682	3427	1417	1717	1728		1760	1656	
Flt Permitted	0.15	1.00	1.00	0.38	1.00	1.00	0.75	1.00		0.71	1.00	
Satd. Flow (perm)	252	3330	1386	678	3427	1417	1347	1728		1318	1656	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	674	23	30	1421	28	109	37	33	10	4	14
RTOR Reduction (vph)	0	0	4	0	0	2	0	27	0	0	12	0
Lane Group Flow (vph)	25	674	19	30	1421	26	109	43	0	10	6	0
Confl. Peds. (#/hr)	8		6	6		8	19		15	15		19
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	84.8	84.8	84.8	84.8	84.8	84.8	21.2	21.2		21.2	21.2	
Effective Green, g (s)	84.8	84.8	84.8	84.8	84.8	84.8	21.2	21.2		21.2	21.2	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18		0.18	0.18	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0		8.0	8.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	178	2353	979	479	2422	1001	238	305		233	293	
v/s Ratio Prot		0.20			c0.41			0.02			0.00	
v/s Ratio Perm	0.10		0.01	0.04		0.02	c0.08			0.01		
v/c Ratio	0.14	0.29	0.02	0.06	0.59	0.03	0.46	0.14		0.04	0.02	
Uniform Delay, d1	5.7	6.5	5.2	5.4	8.8	5.3	44.3	41.7		41.0	40.8	
Progression Factor	0.80	0.79	0.68	0.56	0.56	0.50	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.3	0.0	0.2	0.9	0.0	1.4	0.2		0.1	0.0	
Delay (s)	6.2	5.4	3.6	3.2	5.8	2.7	45.7	41.9		41.1	40.9	
Level of Service	A	A	A	A	A	A	D	D		D	D	
Approach Delay (s)		5.4			5.7			44.2			40.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	265	625	0	0	1238	250	0	0	0	150	0	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	7.0			7.0					7.0	7.0	3.0
Lane Util. Factor	1.00	0.95			0.95					0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00			0.99					1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00					1.00	1.00	1.00
Frt	1.00	1.00			0.97					1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)	1646	3096			3287					1600	1636	1523
Flt Permitted	0.10	1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)	175	3096			3287					1600	1636	1523
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	265	625	0	0	1238	250	0	0	0	150	0	260
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	0	153
Lane Group Flow (vph)	265	625	0	0	1478	0	0	0	0	75	75	107
Confl. Peds. (#/hr)	29		13	13		29	22		3	3		22
Confl. Bikes (#/hr)			1			4						
Heavy Vehicles (%)	6%	14%	0%	0%	3%	5%	0%	0%	0%	6%	0%	3%
Turn Type	pm+pt			Perm			Perm			Split		pm+ov
Protected Phases	5	2			6			3		4	4	5
Permitted Phases	2			6			3					4
Actuated Green, G (s)	92.0	92.0			73.0					14.0	14.0	30.0
Effective Green, g (s)	92.0	92.0			73.0					14.0	14.0	30.0
Actuated g/C Ratio	0.77	0.77			0.61					0.12	0.12	0.25
Clearance Time (s)	3.0	7.0			7.0					7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)	330	2374			2000					187	191	381
v/s Ratio Prot	c0.11	0.20			0.45					c0.05	0.05	0.04
v/s Ratio Perm	c0.51											0.03
v/c Ratio	0.80	0.26			0.74					0.40	0.39	0.28
Uniform Delay, d1	26.5	4.1			16.7					49.1	49.1	36.3
Progression Factor	1.00	1.00			0.43					1.00	1.00	1.00
Incremental Delay, d2	13.2	0.3			2.2					1.4	1.3	0.4
Delay (s)	39.6	4.4			9.5					50.5	50.4	36.7
Level of Service	D	A			A					D	D	D
Approach Delay (s)		14.9			9.5			0.0			41.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	910	48	104	1627	37	76	37	72	75	21	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1675	3394	1409	1684	3412		1726	1666		1709	1633	
Flt Permitted	0.11	1.00	1.00	0.30	1.00		0.71	1.00		0.69	1.00	
Satd. Flow (perm)	197	3394	1409	532	3412		1288	1666		1235	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	53	910	48	104	1627	37	76	37	72	75	21	53
RTOR Reduction (vph)	0	0	8	0	1	0	0	62	0	0	23	0
Lane Group Flow (vph)	53	910	40	104	1663	0	76	47	0	75	51	0
Confl. Peds. (#/hr)	10		10	10		10	12		13	13		12
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)	74.8	74.8	74.8	74.8	74.8		13.2	13.2		13.2	13.2	
Effective Green, g (s)	74.8	74.8	74.8	74.8	74.8		13.2	13.2		13.2	13.2	
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75		0.13	0.13		0.13	0.13	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	147	2539	1054	398	2552		170	220		163	216	
v/s Ratio Prot		0.27			c0.49			0.03			0.03	
v/s Ratio Perm	0.27		0.03	0.20			0.06			c0.06		
v/c Ratio	0.36	0.36	0.04	0.26	0.65		0.45	0.21		0.46	0.24	
Uniform Delay, d1	4.3	4.3	3.3	3.9	6.2		40.0	38.8		40.1	38.9	
Progression Factor	0.49	0.54	0.32	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	0.4	0.1	1.6	1.3		1.9	0.5		2.1	0.6	
Delay (s)	8.8	2.8	1.1	5.5	7.5		41.9	39.2		42.2	39.5	
Level of Service	A	A	A	A	A		D	D		D	D	
Approach Delay (s)		3.0			7.4			40.3			40.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	798	31	24	1440	18	45	8	30	65	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.98	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1721	3295		1712	3311		1742	1638		1734	1707	
Flt Permitted	0.15	1.00		0.33	1.00		0.74	1.00		0.73	1.00	
Satd. Flow (perm)	270	3295		593	3311		1355	1638		1337	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	798	31	24	1440	18	45	8	30	65	11	17
RTOR Reduction (vph)	0	2	0	0	1	0	0	26	0	0	15	0
Lane Group Flow (vph)	17	827	0	24	1457	0	45	12	0	65	13	0
Confl. Peds. (#/hr)	17		11	11		17	21		25	25		21
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	74.3	74.3		74.3	74.3		13.7	13.7		13.7	13.7	
Effective Green, g (s)	74.3	74.3		74.3	74.3		13.7	13.7		13.7	13.7	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.14	0.14		0.14	0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	2448		441	2460		186	224		183	234	
v/s Ratio Prot		0.25			c0.44			0.01			0.01	
v/s Ratio Perm	0.06			0.04			0.03			c0.05		
v/c Ratio	0.08	0.34		0.05	0.59		0.24	0.05		0.36	0.06	
Uniform Delay, d1	3.5	4.4		3.4	5.9		38.5	37.5		39.1	37.5	
Progression Factor	0.65	0.63		0.86	1.36		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4		0.2	0.9		0.7	0.1		1.2	0.1	
Delay (s)	3.1	3.1		3.2	8.9		39.2	37.6		40.3	37.6	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.1			8.8			38.5			39.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	838	42	18	1286	57	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.4	3.3	3.3	3.4	3.5	3.5
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		0.99	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3195		1685	3256	1716	1483
Flt Permitted	1.00		0.31	1.00	0.95	1.00
Satd. Flow (perm)	3195		556	3256	1716	1483
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	838	42	18	1286	57	21
RTOR Reduction (vph)	2	0	0	0	0	19
Lane Group Flow (vph)	878	0	18	1286	57	2
Confl. Peds. (#/hr)		7	7			18
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Parking (#/hr)	0			0		
Turn Type			Perm			Perm
Protected Phases	2			2	4	
Permitted Phases			2			4
Actuated Green, G (s)	76.2		76.2	76.2	11.8	11.8
Effective Green, g (s)	76.2		76.2	76.2	11.8	11.8
Actuated g/C Ratio	0.76		0.76	0.76	0.12	0.12
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2435		424	2481	202	175
v/s Ratio Prot	0.27			c0.40	c0.03	
v/s Ratio Perm			0.03			0.00
v/c Ratio	0.36		0.04	0.52	0.28	0.01
Uniform Delay, d1	3.9		2.9	4.7	40.2	39.0
Progression Factor	0.51		0.30	0.24	1.00	1.00
Incremental Delay, d2	0.4		0.2	0.7	0.8	0.0
Delay (s)	2.4		1.0	1.8	41.0	39.0
Level of Service	A		A	A	D	D
Approach Delay (s)	2.4			1.8	40.5	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	3.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	752	19	6	1162	22	10	1	7	11	1	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.95	
Flpb, ped/bikes		1.00			1.00			0.96			1.00	
Frt		1.00			1.00			0.95			0.91	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3281			3332			1695			1634	
Flt Permitted		0.88			0.95			0.81			0.88	
Satd. Flow (perm)		2884			3170			1410			1465	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	27	752	19	6	1162	22	10	1	7	11	1	21
RTOR Reduction (vph)	0	1	0	0	1	0	0	6	0	0	19	0
Lane Group Flow (vph)	0	797	0	0	1189	0	0	12	0	0	14	0
Confl. Peds. (#/hr)	29		51	51		29	45		3	3		45
Confl. Bikes (#/hr)			6			1			1			2
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		76.4			76.4			9.6			9.6	
Effective Green, g (s)		76.4			76.4			9.6			9.6	
Actuated g/C Ratio		0.76			0.76			0.10			0.10	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2203			2422			135			141	
v/s Ratio Prot												
v/s Ratio Perm		0.28			c0.38			0.01			c0.01	
v/c Ratio		0.36			0.49			0.09			0.10	
Uniform Delay, d1		3.8			4.5			41.2			41.3	
Progression Factor		1.19			0.79			1.00			1.00	
Incremental Delay, d2		0.4			0.6			0.3			0.3	
Delay (s)		5.0			4.1			41.5			41.6	
Level of Service		A			A			D			D	
Approach Delay (s)		5.0			4.1			41.5			41.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	686	7	41	902	190	15	107	45	257	101	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.93	1.00	0.98		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00	0.95	1.00		0.96	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1643	3495	1412	1675	3495	1455	1703	1782		1720	1921	1467
Flt Permitted	0.21	1.00	1.00	0.39	1.00	1.00	0.69	1.00		0.66	1.00	1.00
Satd. Flow (perm)	363	3495	1412	689	3495	1455	1240	1782		1196	1921	1467
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	686	7	41	902	190	15	107	45	257	101	290
RTOR Reduction (vph)	0	0	2	0	0	57	0	17	0	0	0	22
Lane Group Flow (vph)	250	686	5	41	902	133	15	135	0	257	101	268
Confl. Peds. (#/hr)	56		32	32		56	53		45	45		53
Confl. Bikes (#/hr)			8			3			1			
Heavy Vehicles (%)	6%	1%	0%	2%	1%	0%	0%	1%	2%	0%	0%	4%
Bus Blockages (#/hr)	0	0	5	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt		Perm	Perm		Perm	Perm			Perm		pm+ov
Protected Phases	5	2			6			4			8	5
Permitted Phases	2		2	6		6	4			8		8
Actuated Green, G (s)	60.4	60.4	60.4	45.9	45.9	45.9	26.6	26.6		26.6	26.6	38.1
Effective Green, g (s)	60.4	60.4	60.4	45.9	45.9	45.9	26.6	26.6		26.6	26.6	38.1
Actuated g/C Ratio	0.60	0.60	0.60	0.46	0.46	0.46	0.27	0.27		0.27	0.27	0.38
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	366	2111	853	316	1604	668	330	474		318	511	559
v/s Ratio Prot	c0.08	0.20			0.26			0.08			0.05	0.06
v/s Ratio Perm	c0.33		0.00	0.06		0.09	0.01			c0.21		0.13
v/c Ratio	0.68	0.32	0.01	0.13	0.56	0.20	0.05	0.29		0.81	0.20	0.48
Uniform Delay, d1	11.7	9.8	7.9	15.6	19.7	16.1	27.3	29.1		34.3	28.4	23.4
Progression Factor	2.02	1.54	2.03	1.31	1.26	1.71	1.00	1.00		0.76	0.70	0.56
Incremental Delay, d2	5.0	0.4	0.0	0.8	1.3	0.6	0.1	0.3		13.7	0.2	0.6
Delay (s)	28.6	15.4	16.0	21.2	26.1	28.1	27.3	29.5		39.6	20.1	13.9
Level of Service	C	B	B	C	C	C	C	C		D	C	B
Approach Delay (s)		18.9			26.2			29.3			25.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	853	29	21	1133	44	39	31	28	48	15	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	0.89		1.00	0.92	
Flpb, ped/bikes		1.00			1.00		0.93	1.00		0.80	1.00	
Frt		1.00			0.99		1.00	0.93		1.00	0.87	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3292			3300		1657	1597		1032	1465	
Flt Permitted		0.86			0.93		0.69	1.00		0.72	1.00	
Satd. Flow (perm)		2852			3064		1202	1597		781	1465	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	33	853	29	21	1133	44	39	31	28	48	15	90
RTOR Reduction (vph)	0	2	0	0	2	0	0	23	0	0	52	0
Lane Group Flow (vph)	0	913	0	0	1196	0	39	36	0	48	53	0
Confl. Peds. (#/hr)	102		7	7		102	58		149	149		58
Confl. Bikes (#/hr)			6			5			1			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	39%	0%	6%
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		69.6			69.6		18.4	18.4		18.4	18.4	
Effective Green, g (s)		69.6			69.6		18.4	18.4		18.4	18.4	
Actuated g/C Ratio		0.70			0.70		0.18	0.18		0.18	0.18	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1985			2133		221	294		144	270	
v/s Ratio Prot								0.02			0.04	
v/s Ratio Perm		0.32			c0.39		0.03			c0.06		
v/c Ratio		0.46			0.56		0.18	0.12		0.33	0.20	
Uniform Delay, d1		6.8			7.6		34.4	34.1		35.5	34.5	
Progression Factor		0.37			0.63		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			1.0		0.4	0.2		1.4	0.4	
Delay (s)		2.8			5.7		34.8	34.3		36.8	34.9	
Level of Service		A			A		C	C		D	C	
Approach Delay (s)		2.8			5.7			34.5			35.5	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	930	103	43	1327	17	71	9	36	19	9	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		8.0			8.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	0.96		1.00	0.94	
Flpb, ped/bikes		1.00			1.00		0.96	1.00		0.96	1.00	
Frt		0.99			1.00		1.00	0.88		1.00	0.86	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3168			3271		1719	1616		1694	1536	
Flt Permitted		0.54			0.86		0.54	1.00		0.73	1.00	
Satd. Flow (perm)		1736			2805		970	1616		1297	1536	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	152	930	103	43	1327	17	71	9	36	19	9	170
RTOR Reduction (vph)	0	6	0	0	1	0	0	31	0	0	44	0
Lane Group Flow (vph)	0	1179	0	0	1386	0	71	14	0	19	135	0
Confl. Peds. (#/hr)	41		21	21		41	32		28	28		32
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Bus Blockages (#/hr)	0	0	7	0	0	7	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		70.5			70.5		14.5	14.5		14.5	14.5	
Effective Green, g (s)		70.5			70.5		14.5	14.5		14.5	14.5	
Actuated g/C Ratio		0.70			0.70		0.14	0.14		0.14	0.14	
Clearance Time (s)		8.0			8.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1224			1978		141	234		188	223	
v/s Ratio Prot								0.01			c0.09	
v/s Ratio Perm		c0.68			0.49		0.07			0.01		
v/c Ratio		0.96			0.70		0.50	0.06		0.10	0.60	
Uniform Delay, d1		13.6			8.6		39.4	36.9		37.1	40.1	
Progression Factor		1.01			0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2		18.0			1.9		2.8	0.1		0.2	4.5	
Delay (s)		31.7			9.7		42.2	37.0		37.3	44.6	
Level of Service		C			A		D	D		D	D	
Approach Delay (s)		31.7			9.7			40.2			43.9	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	118.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	984	5	21	1377	7	7	2	17	18	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1714	3491		1716	3524		1760	1607		1746	1611	
Flt Permitted	0.17	1.00		0.28	1.00		0.75	1.00		0.75	1.00	
Satd. Flow (perm)	308	3491		500	3524		1384	1607		1370	1611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	984	5	21	1377	7	7	2	17	18	1	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	15	0	0	13	0
Lane Group Flow (vph)	17	989	0	21	1384	0	7	4	0	18	3	0
Confl. Peds. (#/hr)	58		25	25		58	11		17	17		11
Confl. Bikes (#/hr)			6						2			
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	77.0	77.0		77.0	77.0		11.0	11.0		11.0	11.0	
Effective Green, g (s)	77.0	77.0		77.0	77.0		11.0	11.0		11.0	11.0	
Actuated g/C Ratio	0.77	0.77		0.77	0.77		0.11	0.11		0.11	0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	237	2688		385	2713		152	177		151	177	
v/s Ratio Prot		0.28			c0.39			0.00			0.00	
v/s Ratio Perm	0.06			0.04			0.01			c0.01		
v/c Ratio	0.07	0.37		0.05	0.51		0.05	0.02		0.12	0.01	
Uniform Delay, d1	2.8	3.7		2.8	4.4		39.8	39.7		40.1	39.7	
Progression Factor	1.08	1.17		1.35	1.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3		0.2	0.5		0.1	0.1		0.4	0.0	
Delay (s)	3.5	4.6		3.9	6.9		39.9	39.8		40.5	39.7	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.6			6.8			39.8			40.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	889	25	22	1377	255	50	38	20	233	65	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0	6.0	7.0	7.0		5.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.95		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1678	3206		1659	3224	1385	1729	1774		3395	1663	
Flt Permitted	0.08	1.00		0.31	1.00	1.00	0.63	1.00		0.95	1.00	
Satd. Flow (perm)	137	3206		545	3224	1385	1153	1774		3395	1663	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	889	25	22	1377	255	50	38	20	233	65	133
RTOR Reduction (vph)	0	1	0	0	0	45	0	18	0	0	97	0
Lane Group Flow (vph)	142	913	0	22	1377	210	50	40	0	233	101	0
Confl. Peds. (#/hr)	15		15	15		15	15		8	8		15
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0			0							
Turn Type	pm+pt			Perm		Perm	Perm			Prot		
Protected Phases	5	2			6			4		3	8	
Permitted Phases	2			6		6	4					
Actuated Green, G (s)	60.3	60.3		48.4	48.4	48.4	11.7	11.7		10.0	26.7	
Effective Green, g (s)	60.3	60.3		48.4	48.4	48.4	11.7	11.7		10.0	26.7	
Actuated g/C Ratio	0.60	0.60		0.48	0.48	0.48	0.12	0.12		0.10	0.27	
Clearance Time (s)	3.0	6.0		6.0	6.0	6.0	7.0	7.0		5.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	1933		264	1560	670	135	208		340	444	
v/s Ratio Prot	c0.06	0.28			c0.43			0.02		c0.07	0.06	
v/s Ratio Perm	0.33			0.04		0.15	c0.04					
v/c Ratio	0.65	0.47		0.08	0.88	0.31	0.37	0.19		0.69	0.23	
Uniform Delay, d1	17.7	11.0		13.9	23.2	15.7	40.8	39.9		43.5	28.6	
Progression Factor	2.00	0.98		0.72	0.75	0.59	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	0.8		0.6	7.1	1.1	1.7	0.5		5.6	0.3	
Delay (s)	41.4	11.5		10.6	24.5	10.4	42.5	40.3		49.1	28.9	
Level of Service	D	B		B	C	B	D	D		D	C	
Approach Delay (s)		15.6			22.1			41.3			39.8	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	7	1010	1589	180	6	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.4	3.3	3.5	3.5
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1745	3495	3530	1530	1785	1597
Flt Permitted	0.13	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	246	3495	3530	1530	1785	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	1010	1589	180	6	3
RTOR Reduction (vph)	0	0	0	13	0	3
Lane Group Flow (vph)	7	1010	1589	167	6	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	5	0	0
Turn Type	Perm			Perm		Perm
Protected Phases		2	2		4	
Permitted Phases	2			2		4
Actuated Green, G (s)	78.0	78.0	78.0	78.0	8.0	8.0
Effective Green, g (s)	78.0	78.0	78.0	78.0	8.0	8.0
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.08	0.08
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	192	2726	2753	1193	143	128
v/s Ratio Prot		0.29	c0.45		c0.00	
v/s Ratio Perm	0.03			0.11		0.00
v/c Ratio	0.04	0.37	0.58	0.14	0.04	0.00
Uniform Delay, d1	2.5	3.4	4.4	2.7	42.5	42.3
Progression Factor	0.34	0.72	0.87	0.10	1.00	1.00
Incremental Delay, d2	0.3	0.4	0.6	0.2	0.1	0.0
Delay (s)	1.2	2.8	4.5	0.4	42.6	42.3
Level of Service	A	A	A	A	D	D
Approach Delay (s)		2.8	4.1		42.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	3.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1126	13	14	1183	33	32	6	10	27	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			0.97			0.97	
Frt		1.00			1.00			0.97			1.00	
Flt Protected		1.00			1.00			0.97			0.95	
Satd. Flow (prot)		3419			3439			1738			1761	
Flt Permitted		0.95			0.94			0.78			0.70	
Satd. Flow (perm)		3264			3220			1405			1291	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	1126	13	14	1183	33	32	6	10	27	0	1
RTOR Reduction (vph)	0	0	0	0	1	0	0	9	0	0	1	0
Lane Group Flow (vph)	0	1140	0	0	1229	0	0	39	0	0	27	0
Confl. Peds. (#/hr)	14		7	7		14	28		23	23		28
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		75.6			75.6			12.4			12.4	
Effective Green, g (s)		75.6			75.6			12.4			12.4	
Actuated g/C Ratio		0.76			0.76			0.12			0.12	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		2468			2434			174			160	
v/s Ratio Prot												
v/s Ratio Perm		0.35			c0.38			c0.03			0.02	
v/c Ratio		0.46			0.50			0.23			0.17	
Uniform Delay, d1		4.6			4.8			39.5			39.2	
Progression Factor		0.76			0.85			1.00			1.00	
Incremental Delay, d2		0.6			0.6			0.7			0.5	
Delay (s)		4.1			4.7			40.1			39.7	
Level of Service		A			A			D			D	
Approach Delay (s)		4.1			4.7			40.1			39.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	1149	2	7	1231	73	3	0	9	44	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.4	3.3	3.3	3.4	3.3	3.5	3.7	3.5	3.5	3.5	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.98	1.00		0.98	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1688	3426		1699	3422		1755	1580		1748	1551	
Flt Permitted	0.19	1.00		0.23	1.00		0.75	1.00		0.75	1.00	
Satd. Flow (perm)	332	3426		406	3422		1390	1580		1383	1551	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	1149	2	7	1231	73	3	0	9	44	0	8
RTOR Reduction (vph)	0	0	0	0	3	0	0	8	0	0	7	0
Lane Group Flow (vph)	24	1151	0	7	1301	0	3	1	0	44	1	0
Confl. Peds. (#/hr)	10		15	15		10	13		16	16		13
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	74.5	74.5		74.5	74.5		11.5	11.5		11.5	11.5	
Effective Green, g (s)	74.5	74.5		74.5	74.5		11.5	11.5		11.5	11.5	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.12	0.12		0.12	0.12	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	2552		302	2549		160	182		159	178	
v/s Ratio Prot		0.34			c0.38			0.00			0.00	
v/s Ratio Perm	0.07			0.02			0.00			c0.03		
v/c Ratio	0.10	0.45		0.02	0.51		0.02	0.01		0.28	0.01	
Uniform Delay, d1	3.5	4.9		3.3	5.2		39.2	39.2		40.4	39.2	
Progression Factor	1.00	1.00		0.46	0.31		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.6		0.1	0.7		0.0	0.0		1.0	0.0	
Delay (s)	4.3	5.5		1.6	2.3		39.3	39.2		41.4	39.2	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		5.5			2.3			39.2			41.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	4.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	889	2	2	1135	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.4	3.3	3.3	3.4	3.5	3.5
Total Lost time (s)	6.0			6.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3494			3495		
Flt Permitted	1.00			0.95		
Satd. Flow (perm)	3494			3331		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	889	2	2	1135	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	891	0	0	1137	0	0
Heavy Vehicles (%)	1%	0%	0%	1%	2%	2%
Turn Type			Perm			
Protected Phases	2			6		
Permitted Phases			6			
Actuated Green, G (s)	17.0			17.0		
Effective Green, g (s)	17.0			17.0		
Actuated g/C Ratio	0.56			0.56		
Clearance Time (s)	6.0			6.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	1947			1857		
v/s Ratio Prot	0.25					
v/s Ratio Perm				c0.34		
v/c Ratio	0.46			0.61		
Uniform Delay, d1	4.0			4.5		
Progression Factor	1.00			1.00		
Incremental Delay, d2	0.2			0.6		
Delay (s)	4.2			5.1		
Level of Service	A			A		
Approach Delay (s)	4.2			5.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	4.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	30.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	676	8	8	973	123	5	1	4	121	9	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	0.98			1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00			0.99	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1671	3433	1420	1701	3500	1443	1621	1511			1785	1545
Flt Permitted	0.28	1.00	1.00	0.39	1.00	1.00	0.55	1.00			0.74	1.00
Satd. Flow (perm)	488	3433	1420	696	3500	1443	943	1511			1377	1545
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	676	8	8	973	123	5	1	4	121	9	123
RTOR Reduction (vph)	0	0	1	0	0	15	0	3	0	0	0	106
Lane Group Flow (vph)	128	676	7	8	973	108	5	2	0	0	130	17
Confl. Peds. (#/hr)	5		4	4		5	1		6	6		1
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	10%	10%	10%	2%	2%	2%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		4
Actuated Green, G (s)	109.0	109.0	109.0	109.0	109.0	109.0	19.0	19.0			19.0	19.0
Effective Green, g (s)	109.0	109.0	109.0	109.0	109.0	109.0	19.0	19.0			19.0	19.0
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78	0.14	0.14			0.14	0.14
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	380	2673	1106	542	2725	1123	128	205			187	210
v/s Ratio Prot		0.20			c0.28			0.00				
v/s Ratio Perm	0.26		0.00	0.01		0.07	0.01				c0.09	0.01
v/c Ratio	0.34	0.25	0.01	0.01	0.36	0.10	0.04	0.01			0.70	0.08
Uniform Delay, d1	4.7	4.3	3.4	3.5	4.8	3.7	52.6	52.3			57.7	52.9
Progression Factor	0.94	0.67	0.37	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.3	0.2	0.0	0.0	0.4	0.2	0.1	0.0			10.7	0.2
Delay (s)	6.7	3.1	1.3	3.5	5.1	3.9	52.7	52.4			68.4	53.0
Level of Service	A	A	A	A	A	A	D	D			E	D
Approach Delay (s)		3.6			5.0			52.5			60.9	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	775	52	65	1083	38	31	7	22	28	4	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687	3424		1715	3512		1662	1599		1757	1616	
Flt Permitted	0.24	1.00		0.34	1.00		0.74	1.00		0.74	1.00	
Satd. Flow (perm)	431	3424		607	3512		1297	1599		1365	1616	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	775	52	65	1083	38	31	7	22	28	4	20
RTOR Reduction (vph)	0	2	0	0	1	0	0	20	0	0	18	0
Lane Group Flow (vph)	20	825	0	65	1120	0	31	9	0	28	6	0
Confl. Peds. (#/hr)	7		8	8		7	15		4	4		15
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	1%	1%	1%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	117.2	117.2		117.2	117.2		10.8	10.8		10.8	10.8	
Effective Green, g (s)	117.2	117.2		117.2	117.2		10.8	10.8		10.8	10.8	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	361	2866		508	2940		100	123		105	125	
v/s Ratio Prot		0.24			c0.32			0.01			0.00	
v/s Ratio Perm	0.05			0.11			c0.02			0.02		
v/c Ratio	0.06	0.29		0.13	0.38		0.31	0.07		0.27	0.04	
Uniform Delay, d1	1.9	2.4		2.1	2.7		61.1	59.9		60.9	59.8	
Progression Factor	1.56	1.64		0.40	0.54		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.5	0.4		1.8	0.2		1.4	0.1	
Delay (s)	3.3	4.3		1.3	1.8		62.8	60.2		62.2	60.0	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		4.2			1.8			61.6			61.2	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	5.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	794	95	42	1027	4	91	9	37	3	2	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.99	
Satd. Flow (prot)	1652	3354		1671	3497			1750	1490		1738	
Flt Permitted	0.26	1.00		0.31	1.00			0.74	1.00		0.93	
Satd. Flow (perm)	455	3354		542	3497			1346	1490		1635	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	794	95	42	1027	4	91	9	37	3	2	8
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	30	0	7	0
Lane Group Flow (vph)	11	884	0	42	1031	0	0	100	7	0	6	0
Confl. Peds. (#/hr)	5		11	11		5			4	4		
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	5%	5%	5%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)	111.3	111.3		111.3	111.3			15.7	15.7		15.7	
Effective Green, g (s)	111.3	111.3		111.3	111.3			15.7	15.7		15.7	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.11	0.11		0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	362	2666		431	2780			151	167		183	
v/s Ratio Prot		0.26			c0.29							
v/s Ratio Perm	0.02			0.08				c0.07	0.00		0.00	
v/c Ratio	0.03	0.33		0.10	0.37			0.66	0.04		0.03	
Uniform Delay, d1	3.0	4.0		3.2	4.2			59.6	55.4		55.4	
Progression Factor	0.25	0.25		1.26	1.74			1.00	1.00		1.00	
Incremental Delay, d2	0.2	0.3		0.4	0.4			10.4	0.1		0.1	
Delay (s)	0.9	1.3		4.5	7.6			70.0	55.5		55.5	
Level of Service	A	A		A	A			E	E		E	
Approach Delay (s)		1.3			7.5			66.1			55.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	197	804	14	3	754	79	18	13	7	100	9	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.99			0.99	1.00
Frt	1.00	1.00		1.00	0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1722	3521		1688	3328			1810			1813	1549
Flt Permitted	0.31	1.00		0.34	1.00			0.82			0.72	1.00
Satd. Flow (perm)	556	3521		610	3328			1526			1358	1549
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	197	804	14	3	754	79	18	13	7	100	9	155
RTOR Reduction (vph)	0	1	0	0	4	0	0	6	0	0	0	137
Lane Group Flow (vph)	197	817	0	3	829	0	0	32	0	0	109	18
Confl. Peds. (#/hr)	8		19	19		8	8		8	8		8
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Parking (#/hr)					0							
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	1	6			2			4			4	
Permitted Phases	6			2			4			4		4
Actuated Green, G (s)	111.5	111.5		100.8	100.8			16.5			16.5	16.5
Effective Green, g (s)	111.5	111.5		100.8	100.8			16.5			16.5	16.5
Actuated g/C Ratio	0.80	0.80		0.72	0.72			0.12			0.12	0.12
Clearance Time (s)	3.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	507	2804		439	2396			180			160	183
v/s Ratio Prot	c0.02	0.23			0.25							
v/s Ratio Perm	c0.29			0.00				0.02			c0.08	0.01
v/c Ratio	0.39	0.29		0.01	0.35			0.18			0.68	0.10
Uniform Delay, d1	3.8	3.8		5.5	7.3			55.6			59.2	55.1
Progression Factor	1.31	0.27		0.37	0.37			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.3		0.0	0.4			0.5			11.3	0.2
Delay (s)	5.4	1.3		2.1	3.1			56.1			70.5	55.4
Level of Service	A	A		A	A			E			E	E
Approach Delay (s)		2.1			3.1			56.1			61.6	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	805	12	9	903	0	18	0	11	107	13	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor		0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes		1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		0.99	1.00			1.00			0.99	
Frt		1.00		1.00	1.00			0.95			0.92	
Flt Protected		1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)		3524		1692	3535			1737			1687	
Flt Permitted		1.00		0.32	1.00			0.67			0.88	
Satd. Flow (perm)		3524		572	3535			1203			1505	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	805	12	9	903	0	18	0	11	107	13	200
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	44	0
Lane Group Flow (vph)	0	816	0	9	903	0	0	20	0	0	276	0
Confl. Peds. (#/hr)	10		8	8		10	9		14	14		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type				Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases				2			4			4		
Actuated Green, G (s)		99.9		99.9	99.9			28.1			28.1	
Effective Green, g (s)		99.9		99.9	99.9			28.1			28.1	
Actuated g/C Ratio		0.71		0.71	0.71			0.20			0.20	
Clearance Time (s)		6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		2515		408	2522			241			302	
v/s Ratio Prot		0.23			c0.26							
v/s Ratio Perm				0.02				0.02			c0.18	
v/c Ratio		0.32		0.02	0.36			0.08			0.91	
Uniform Delay, d1		7.5		5.8	7.7			45.5			54.8	
Progression Factor		0.97		0.47	0.64			1.00			1.00	
Incremental Delay, d2		0.3		0.1	0.4			0.2			30.4	
Delay (s)		7.6		2.8	5.3			45.6			85.2	
Level of Service		A		A	A			D			F	
Approach Delay (s)		7.6			5.3			45.6			85.2	
Approach LOS		A			A			D			F	

Intersection Summary			
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	959	23	15	1083	9	28	0	14	33	2	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.97
Flpb, ped/bikes	0.99	1.00		1.00	1.00			0.99			0.99	1.00
Frt	1.00	1.00		1.00	1.00			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.95	1.00
Satd. Flow (prot)	1674	3344		1720	3528			1734			1809	1527
Flt Permitted	0.25	1.00		0.28	1.00			0.78			0.78	1.00
Satd. Flow (perm)	440	3344		512	3528			1394			1485	1527
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	959	23	15	1083	9	28	0	14	33	2	82
RTOR Reduction (vph)	0	1	0	0	0	0	0	13	0	0	0	75
Lane Group Flow (vph)	42	981	0	15	1092	0	0	29	0	0	35	7
Confl. Peds. (#/hr)	13		3	3		13	13		9	9		13
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	5	0	0	0	0	0	0
Parking (#/hr)		0										
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	116.2	116.2		116.2	116.2			11.8			11.8	11.8
Effective Green, g (s)	116.2	116.2		116.2	116.2			11.8			11.8	11.8
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.08			0.08	0.08
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	365	2776		425	2928			117			125	129
v/s Ratio Prot		0.29			c0.31							
v/s Ratio Perm	0.10			0.03				0.02			c0.02	0.00
v/c Ratio	0.12	0.35		0.04	0.37			0.25			0.28	0.05
Uniform Delay, d1	2.2	2.9		2.1	2.9			60.0			60.1	59.0
Progression Factor	0.99	1.16		0.66	0.60			1.00			1.00	1.00
Incremental Delay, d2	0.6	0.3		0.1	0.3			1.1			1.2	0.2
Delay (s)	2.8	3.6		1.5	2.1			61.1			61.3	59.1
Level of Service	A	A		A	A			E			E	E
Approach Delay (s)		3.6			2.1			61.1			59.8	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1139	98	81	1357	8	67	16	76	13	5	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.2	3.2	3.5	3.2	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.96	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1654	3381		1638	3396		1623	1555		1664	1554	
Flt Permitted	0.17	1.00		0.20	1.00		0.75	1.00		0.70	1.00	
Satd. Flow (perm)	295	3381		344	3396		1273	1555		1222	1554	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	1139	98	81	1357	8	67	16	76	13	5	14
RTOR Reduction (vph)	0	3	0	0	0	0	0	65	0	0	12	0
Lane Group Flow (vph)	15	1234	0	81	1365	0	67	27	0	13	7	0
Confl. Peds. (#/hr)	11		10	10		11	31		11	11		31
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	6%	6%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)	105.8	105.8		105.8	105.8		20.2	20.2		20.2	20.2	
Effective Green, g (s)	105.8	105.8		105.8	105.8		20.2	20.2		20.2	20.2	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.14	0.14		0.14	0.14	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	223	2555		260	2566		184	224		176	224	
v/s Ratio Prot		0.37			c0.40			0.02			0.00	
v/s Ratio Perm	0.05			0.24			c0.05			0.01		
v/c Ratio	0.07	0.48		0.31	0.53		0.36	0.12		0.07	0.03	
Uniform Delay, d1	4.4	6.6		5.5	7.0		54.1	52.2		51.8	51.5	
Progression Factor	0.64	0.49		1.47	1.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.4		3.0	0.8		1.2	0.2		0.2	0.1	
Delay (s)	3.2	3.6		11.1	11.6		55.3	52.4		52.0	51.5	
Level of Service	A	A		B	B		E	D		D	D	
Approach Delay (s)		3.6			11.6			53.6			51.7	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	358	860	50	258	759	407	100	474	114	390	518	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.90	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1732	3583	1390	1712	3548	1454	1656	3411	1463	1667	3411	1423
Flt Permitted	0.13	1.00	1.00	0.18	1.00	1.00	0.46	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	239	3583	1390	324	3548	1454	803	3411	1463	435	3411	1423
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	358	860	50	258	759	407	100	474	114	390	518	245
RTOR Reduction (vph)	0	0	13	0	0	303	0	0	94	0	0	167
Lane Group Flow (vph)	358	860	37	258	759	104	100	474	20	390	518	78
Confl. Peds. (#/hr)	26		58	58		26	26		6	6		26
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	7%	7%	7%	7%	7%	7%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4		4	8		8
Actuated Green, G (s)	67.9	43.8	43.8	56.8	35.7	35.7	33.6	24.9	24.9	56.1	44.4	44.4
Effective Green, g (s)	67.9	43.8	43.8	56.8	35.7	35.7	33.6	24.9	24.9	56.1	44.4	44.4
Actuated g/C Ratio	0.49	0.31	0.31	0.41	0.26	0.26	0.24	0.18	0.18	0.40	0.32	0.32
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	427	1121	435	341	905	371	246	607	260	422	1082	451
v/s Ratio Prot	c0.17	0.24		0.11	0.21		0.03	0.14		c0.19	0.15	
v/s Ratio Perm	c0.23		0.03	0.19		0.07	0.07		0.01	c0.18		0.05
v/c Ratio	0.84	0.77	0.08	0.76	0.84	0.28	0.41	0.78	0.08	0.92	0.48	0.17
Uniform Delay, d1	36.0	43.5	34.0	30.8	49.4	41.8	43.0	54.9	48.0	34.0	38.5	34.5
Progression Factor	1.65	0.83	0.91	1.65	0.93	2.21	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.2	5.0	0.4	8.1	8.1	1.6	1.1	6.5	0.1	25.8	0.3	0.2
Delay (s)	72.6	41.1	31.3	58.9	54.2	94.1	44.1	61.4	48.1	59.8	38.8	34.7
Level of Service	E	D	C	E	D	F	D	E	D	E	D	C
Approach Delay (s)		49.6			66.5			56.7			45.1	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	706	152	131	716	7	132	7	55	56	14	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.0	6.0	6.0	3.0	6.0	6.0	4.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1780	3481	1488	1784	3481	1522	1785	1549		1782	1588	
Flt Permitted	0.38	1.00	1.00	0.30	1.00	1.00	0.21	1.00		0.72	1.00	
Satd. Flow (perm)	711	3481	1488	570	3481	1522	391	1549		1344	1588	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.86	0.64
Adj. Flow (vph)	39	706	152	131	716	7	132	7	55	97	16	458
RTOR Reduction (vph)	0	0	49	0	0	3	0	38	0	0	150	0
Lane Group Flow (vph)	39	706	104	131	716	4	132	24	0	97	324	0
Confl. Peds. (#/hr)	2		3	3		2	12		1	1		12
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	0%	6%	1%	0%	6%	0%	0%	0%	7%	0%	0%	0%
Bus Blockages (#/hr)	0	0	7	0	0	5	0	0	0	0	0	0
Turn Type	Perm		Perm	pm+pt		Perm	Perm			Perm		
Protected Phases		2		1	6			4			8	
Permitted Phases	2		2	6		6	4			8		
Actuated Green, G (s)	70.0	70.0	70.0	82.8	82.8	82.8	44.2	44.2		44.2	44.2	
Effective Green, g (s)	70.0	70.0	70.0	82.8	82.8	82.8	47.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.50	0.50	0.50	0.59	0.59	0.59	0.34	0.32		0.32	0.32	
Clearance Time (s)	6.0	6.0	6.0	3.0	6.0	6.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	356	1741	744	422	2059	900	132	489		424	501	
v/s Ratio Prot		c0.20		0.02	c0.21			0.02			0.20	
v/s Ratio Perm	0.05		0.07	0.16		0.00	c0.34			0.07		
v/c Ratio	0.11	0.41	0.14	0.31	0.35	0.00	1.00	0.05		0.23	0.65	
Uniform Delay, d1	18.5	22.0	18.8	13.6	14.7	11.7	46.4	33.3		35.3	41.2	
Progression Factor	1.00	1.00	1.00	0.69	0.57	0.62	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.7	0.4	0.3	0.3	0.0	78.3	0.0		0.3	2.9	
Delay (s)	19.1	22.7	19.2	9.7	8.7	7.2	124.7	33.3		35.6	44.1	
Level of Service	B	C	B	A	A	A	F	C		D	D	
Approach Delay (s)		21.9			8.8			95.5			42.6	
Approach LOS		C			A			F			D	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	943	7	32	1186	1	12	5	40	2	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)		7.0		7.0	7.0		7.5	7.5			7.5	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.87			0.88	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3544		1733	3582		1653	1542			1687	
Flt Permitted		1.00		0.30	1.00		0.83	1.00			0.94	
Satd. Flow (perm)		3544		544	3582		1450	1542			1598	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	943	7	32	1186	1	12	5	40	2	0	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	37	0	0	11	0
Lane Group Flow (vph)	0	950	0	32	1187	0	12	8	0	0	3	0
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	8%	8%	8%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Actuated Green, G (s)		43.5		43.5	43.5		4.8	4.8			4.8	
Effective Green, g (s)		43.5		43.5	43.5		4.8	4.8			4.8	
Actuated g/C Ratio		0.69		0.69	0.69		0.08	0.08			0.08	
Clearance Time (s)		7.0		7.0	7.0		7.5	7.5			7.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2455		377	2481		111	118			122	
v/s Ratio Prot		0.27			c0.33			0.01				
v/s Ratio Perm				0.06			c0.01				0.00	
v/c Ratio		0.39		0.08	0.48		0.11	0.07			0.02	
Uniform Delay, d1		4.1		3.2	4.4		27.0	26.9			26.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1		0.1	0.1		0.4	0.2			0.1	
Delay (s)		4.2		3.2	4.6		27.4	27.2			26.9	
Level of Service		A		A	A		C	C			C	
Approach Delay (s)		4.2			4.5			27.2			26.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	5.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	499	20	97	775	402	99	312	69	352	258	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	7.0		7.0	7.0	7.0	8.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1767	3492		1733	3583	1511	1716	3579	1548	3395	3544	1531
Flt Permitted	0.25	1.00		0.46	1.00	1.00	0.59	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	474	3492		839	3583	1511	1070	3579	1548	3395	3544	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	179	499	20	97	775	402	99	312	69	352	258	186
RTOR Reduction (vph)	0	2	0	0	0	227	0	0	59	0	0	124
Lane Group Flow (vph)	179	517	0	97	775	175	99	312	10	352	258	62
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1			2			5			1
Heavy Vehicles (%)	1%	4%	30%	3%	3%	1%	4%	2%	1%	2%	3%	3%
Bus Blockages (#/hr)	0	0	3	0	0	8	0	0	0	0	0	0
Turn Type	pm+pt			Perm		Perm	Perm		Perm	Prot		Perm
Protected Phases	1	6			2			4		3	8	
Permitted Phases	6			2		2	4		4			8
Actuated Green, G (s)	65.1	65.1		52.1	52.1	52.1	17.5	17.5	17.5	17.4	39.9	39.9
Effective Green, g (s)	65.1	65.1		52.1	52.1	52.1	17.5	17.5	17.5	17.4	39.9	39.9
Actuated g/C Ratio	0.54	0.54		0.43	0.43	0.43	0.15	0.15	0.15	0.14	0.33	0.33
Clearance Time (s)	3.0	7.0		7.0	7.0	7.0	8.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	365	1894		364	1556	656	156	522	226	492	1178	509
v/s Ratio Prot	c0.04	0.15			0.22			0.09		c0.10	0.07	
v/s Ratio Perm	c0.23			0.12		0.12	c0.09		0.01			0.04
v/c Ratio	0.49	0.27		0.27	0.50	0.27	0.63	0.60	0.04	0.72	0.22	0.12
Uniform Delay, d1	15.4	14.7		21.7	24.5	21.7	48.2	48.0	44.1	48.9	28.8	27.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.4		1.8	1.1	1.0	8.2	1.8	0.1	4.9	0.1	0.1
Delay (s)	16.5	15.1		23.5	25.7	22.7	56.4	49.8	44.1	53.8	28.9	28.0
Level of Service	B	B		C	C	C	E	D	D	D	C	C
Approach Delay (s)		15.4			24.6			50.4			39.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	162	70	15	617	25	650
v/c Ratio	0.70	0.28	0.03	0.25	0.05	0.26
Control Delay	48.2	19.1	7.0	6.0	0.8	1.5
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	48.2	19.1	7.0	6.3	0.8	1.5
Queue Length 50th (m)	25.4	4.4	0.6	16.3	0.1	0.6
Queue Length 95th (m)	43.2	15.3	m3.1	37.7	0.4	1.7
Internal Link Dist (m)	68.4	28.1		88.2		101.7
Turn Bay Length (m)			20.0		30.0	
Base Capacity (vph)	368	398	535	2518	516	2508
Starvation Cap Reductn	0	0	0	1210	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.18	0.03	0.47	0.05	0.26

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	164	73	14	209	15	699	130	697	264
v/c Ratio	0.85	0.19	0.05	0.45	0.03	0.31	0.29	0.30	0.26
Control Delay	71.4	17.9	28.3	11.4	7.0	7.5	11.3	8.7	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	71.4	17.9	28.3	11.4	7.0	7.6	11.3	8.7	5.5
Queue Length 50th (m)	30.8	5.9	2.2	7.2	0.9	24.4	9.7	27.6	9.7
Queue Length 95th (m)	49.1	15.2	6.5	23.3	m3.3	36.6	25.6	47.6	26.1
Internal Link Dist (m)		80.0		53.5		101.7		124.1	
Turn Bay Length (m)	50.0				25.0		30.0		10.0
Base Capacity (vph)	340	653	470	683	454	2283	449	2321	1000
Starvation Cap Reductn	0	0	0	0	0	661	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.11	0.03	0.31	0.03	0.43	0.29	0.30	0.26

Intersection Summary

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

Lane Group	EBL	EBT	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	328	723	1224	5	182	282
v/c Ratio	0.71	0.30	0.76	0.02	0.74	0.63
Control Delay	34.2	4.3	29.3	30.2	63.8	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	4.3	29.3	30.2	63.8	16.6
Queue Length 50th (m)	36.5	19.1	119.4	0.6	41.1	12.1
Queue Length 95th (m)	#109.6	29.8	146.5	3.8	60.6	36.2
Internal Link Dist (m)		177.1	458.7	52.2	296.6	
Turn Bay Length (m)	98.0					
Base Capacity (vph)	464	2446	1606	531	406	599
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.30	0.76	0.01	0.45	0.47

Intersection Summary

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

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	45	843	1333	33	47
v/c Ratio	0.16	0.29	0.46	0.23	0.28
Control Delay	3.0	1.7	1.4	52.5	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	1.7	1.4	52.5	17.2
Queue Length 50th (m)	1.0	9.9	6.4	7.6	0.0
Queue Length 95th (m)	3.0	16.2	12.3	15.9	10.4
Internal Link Dist (m)		142.1	396.6	199.0	
Turn Bay Length (m)	90.0				
Base Capacity (vph)	283	2861	2868	313	311
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.29	0.46	0.11	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	28	664	86	1501	5	28	39
v/c Ratio	0.13	0.24	0.17	0.62	0.04	0.25	0.25
Control Delay	3.1	3.0	2.8	3.7	34.8	54.1	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.0	2.8	3.7	34.8	54.1	23.7
Queue Length 50th (m)	1.7	29.3	1.9	21.1	0.5	6.4	1.8
Queue Length 95th (m)	2.5	15.3	6.0	39.6	4.0	14.3	11.3
Internal Link Dist (m)		242.7		212.7	87.2		230.0
Turn Bay Length (m)	130.0		25.0			35.6	
Base Capacity (vph)	214	2723	500	2430	294	243	307
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.24	0.17	0.62	0.02	0.12	0.13

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	3	655	27	23	1440	78	39
v/c Ratio	0.01	0.25	0.02	0.04	0.54	0.54	0.20
Control Delay	9.3	9.1	6.0	2.1	2.4	62.4	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	9.1	6.0	2.1	2.4	62.4	23.0
Queue Length 50th (m)	0.2	23.1	0.1	0.4	12.5	17.8	2.4
Queue Length 95th (m)	m1.0	73.7	1.6	m0.9	19.6	31.1	11.7
Internal Link Dist (m)		358.7			242.7		225.8
Turn Bay Length (m)	20.0		20.0	40.0			
Base Capacity (vph)	220	2667	1110	558	2690	266	343
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.25	0.02	0.04	0.54	0.29	0.11

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	674	23	30	1421	28	109	70	10	18
v/c Ratio	0.14	0.29	0.02	0.06	0.59	0.03	0.46	0.21	0.04	0.06
Control Delay	9.7	6.8	3.7	5.2	7.1	3.6	47.3	22.4	33.8	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	6.8	3.7	5.2	7.1	3.6	47.3	22.4	33.8	17.2
Queue Length 50th (m)	1.1	16.7	0.2	1.1	39.1	0.3	24.8	7.9	2.1	0.8
Queue Length 95th (m)	6.7	45.9	2.4	m4.3	86.7	m3.0	35.3	17.3	5.8	6.2
Internal Link Dist (m)		211.5			358.7			239.0		192.7
Turn Bay Length (m)	15.0		20.0	20.0		20.0			21.1	
Base Capacity (vph)	179	2352	984	480	2421	1004	494	654	483	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.29	0.02	0.06	0.59	0.03	0.22	0.11	0.02	0.03

Intersection Summary

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

Lane Group	EBL	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	265	625	1488	75	75	260
v/c Ratio	0.79	0.26	0.74	0.40	0.39	0.45
Control Delay	37.7	5.3	11.1	53.1	52.6	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	5.3	11.1	53.1	52.6	9.4
Queue Length 50th (m)	28.6	16.4	113.2	18.0	18.0	9.7
Queue Length 95th (m)	#78.5	41.7	#216.0	28.5	28.4	23.8
Internal Link Dist (m)		72.9	117.3		258.4	
Turn Bay Length (m)	20.0			59.0		
Base Capacity (vph)	349	2375	2012	237	243	588
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.26	0.74	0.32	0.31	0.44

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	910	48	104	1664	76	109	75	74
v/c Ratio	0.36	0.36	0.05	0.26	0.65	0.45	0.39	0.46	0.31
Control Delay	10.7	3.2	0.9	7.3	8.8	46.3	18.6	47.1	28.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	3.2	0.9	7.3	8.8	46.3	18.6	47.1	28.5
Queue Length 50th (m)	2.0	17.6	0.0	4.8	62.8	14.1	6.6	13.9	8.6
Queue Length 95th (m)	8.8	28.3	0.2	18.0	136.1	24.3	19.0	24.1	18.6
Internal Link Dist (m)		206.4			146.8		32.4		230.0
Turn Bay Length (m)	30.0		20.0	48.0		15.0		13.5	
Base Capacity (vph)	148	2537	1062	398	2552	361	518	346	476
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.05	0.26	0.65	0.21	0.21	0.22	0.16

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	829	24	1458	45	38	65	28
v/c Ratio	0.08	0.33	0.05	0.57	0.22	0.14	0.32	0.10
Control Delay	5.2	3.9	5.6	11.4	35.9	14.6	38.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	3.9	5.6	11.4	35.9	14.6	38.7	18.7
Queue Length 50th (m)	0.6	22.5	1.2	87.2	8.2	1.4	12.1	2.0
Queue Length 95th (m)	m2.0	22.8	m2.3	158.4	15.7	8.9	21.2	8.3
Internal Link Dist (m)		201.3		159.0		182.5		150.8
Turn Bay Length (m)	17.3		15.5					
Base Capacity (vph)	208	2527	455	2539	393	497	387	507
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.33	0.05	0.57	0.11	0.08	0.17	0.06

Intersection Summary

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

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	880	18	1286	57	21
v/c Ratio	0.36	0.04	0.52	0.28	0.11
Control Delay	2.8	1.6	2.0	41.5	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	1.6	2.0	41.5	14.6
Queue Length 50th (m)	13.7	0.1	4.5	10.6	0.0
Queue Length 95th (m)	12.4	m0.5	13.1	18.9	5.8
Internal Link Dist (m)	223.1		201.3	159.6	
Turn Bay Length (m)		13.4			
Base Capacity (vph)	2439	424	2482	463	416
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.04	0.52	0.12	0.05

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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	798	1190	18	33
v/c Ratio	0.34	0.46	0.10	0.16
Control Delay	6.0	4.9	26.8	20.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.0	4.9	26.8	20.7
Queue Length 50th (m)	19.8	11.1	2.0	2.2
Queue Length 95th (m)	44.6	47.2	7.6	9.8
Internal Link Dist (m)	216.4	223.1	189.9	153.8
Turn Bay Length (m)				
Base Capacity (vph)	2367	2599	358	383
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.46	0.05	0.09

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	686	7	41	902	190	15	152	257	101	290
v/c Ratio	0.66	0.32	0.01	0.13	0.56	0.26	0.05	0.31	0.81	0.20	0.46
Control Delay	28.0	17.0	13.3	26.1	28.2	16.2	24.5	24.9	44.7	19.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	28.0	17.0	13.3	26.1	28.2	16.2	24.5	24.9	44.7	19.5	11.1
Queue Length 50th (m)	27.6	40.6	0.2	5.7	82.2	16.3	2.1	18.8	45.6	8.3	9.4
Queue Length 95th (m)	#63.8	79.8	m2.4	m12.4	78.7	29.5	6.4	33.2	71.9	13.4	14.0
Internal Link Dist (m)		55.5			216.4			160.5		88.2	
Turn Bay Length (m)	24.5		24.5	28.8		26.1	26.1		30.0		
Base Capacity (vph)	383	2112	855	317	1607	726	409	604	394	634	644
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	50
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.32	0.01	0.13	0.56	0.26	0.04	0.25	0.65	0.16	0.49

Intersection Summary

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

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	915	1198	39	59	48	105
v/c Ratio	0.46	0.56	0.18	0.19	0.33	0.33
Control Delay	3.0	6.2	34.7	21.5	40.6	18.1
Queue Delay	1.0	0.0	0.2	0.0	0.0	0.2
Total Delay	4.0	6.2	34.8	21.5	40.6	18.4
Queue Length 50th (m)	3.7	28.1	6.2	4.9	7.9	6.5
Queue Length 95th (m)	m40.7	18.5	15.2	15.4	18.5	20.5
Internal Link Dist (m)	81.6	108.7		86.4		94.4
Turn Bay Length (m)						
Base Capacity (vph)	1987	2134	301	420	195	414
Starvation Cap Reductn	741	0	0	0	0	0
Spillback Cap Reductn	0	0	57	0	0	70
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.56	0.16	0.14	0.25	0.31

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1185	1387	71	45	19	179
v/c Ratio	0.96	0.70	0.50	0.17	0.10	0.67
Control Delay	34.0	10.9	50.4	15.8	35.3	40.1
Queue Delay	1.0	0.1	0.0	0.0	0.0	0.0
Total Delay	35.0	11.0	50.4	15.8	35.3	40.1
Queue Length 50th (m)	127.4	43.3	13.0	1.5	3.3	23.6
Queue Length 95th (m)	#178.2	76.3	25.1	10.3	9.1	42.4
Internal Link Dist (m)	352.7	81.6		124.7		72.1
Turn Bay Length (m)			8.3			
Base Capacity (vph)	1231	1978	223	399	299	394
Starvation Cap Reductn	0	67	0	0	0	0
Spillback Cap Reductn	10	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.73	0.32	0.11	0.06	0.45

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	989	21	1384	7	19	18	16
v/c Ratio	0.07	0.37	0.05	0.51	0.05	0.10	0.12	0.08
Control Delay	5.5	5.5	6.1	8.2	36.4	17.9	38.7	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	5.5	6.1	8.2	36.4	17.9	38.7	17.8
Queue Length 50th (m)	0.7	23.7	0.7	31.5	1.3	0.4	3.3	0.2
Queue Length 95th (m)	m1.6	28.3	m2.7	134.6	4.6	6.0	8.4	5.4
Internal Link Dist (m)		159.2		352.7		101.4		82.5
Turn Bay Length (m)	8.6		10.2		18.0		40.0	
Base Capacity (vph)	242	2687	387	2713	360	431	356	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.37	0.05	0.51	0.02	0.04	0.05	0.04

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	914	22	1377	255	50	58	233	198
v/c Ratio	0.63	0.46	0.08	0.86	0.35	0.33	0.23	0.69	0.38
Control Delay	43.1	13.2	15.2	26.3	9.1	41.9	27.1	54.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	13.2	15.2	26.3	9.1	41.9	27.1	54.7	11.0
Queue Length 50th (m)	18.2	32.2	1.5	104.0	6.0	9.3	6.9	22.8	9.9
Queue Length 95th (m)	#40.1	93.1	m3.6	#228.0	23.4	16.4	14.6	#35.9	20.0
Internal Link Dist (m)		273.8		159.2			168.4		175.9
Turn Bay Length (m)	28.8		53.3		28.9	15.0		58.1	
Base Capacity (vph)	228	1980	272	1606	734	369	581	340	852
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.46	0.08	0.86	0.35	0.14	0.10	0.69	0.23

Intersection Summary

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

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

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	7	1010	1589	180	6	3
v/c Ratio	0.04	0.37	0.58	0.15	0.04	0.02
Control Delay	1.3	2.8	4.6	0.4	43.3	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.3	2.8	4.6	0.4	43.3	28.7
Queue Length 50th (m)	0.3	28.2	9.3	0.0	1.1	0.0
Queue Length 95th (m)	m0.1	2.4	64.8	m0.1	5.0	2.8
Internal Link Dist (m)		191.5	273.8		73.1	
Turn Bay Length (m)	31.2			15.2		
Base Capacity (vph)	192	2726	2753	1206	464	417
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.37	0.58	0.15	0.01	0.01

Intersection Summary

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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1140	1230	48	28
v/c Ratio	0.46	0.50	0.26	0.17
Control Delay	4.6	5.4	34.4	37.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.6	5.4	34.4	37.9
Queue Length 50th (m)	25.7	7.1	7.1	5.0
Queue Length 95th (m)	37.0	57.0	16.0	11.9
Internal Link Dist (m)	340.0	183.0	287.5	286.5
Turn Bay Length (m)				
Base Capacity (vph)	2466	2436	345	311
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.50	0.14	0.09

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	1151	7	1304	3	9	44	8
v/c Ratio	0.10	0.45	0.02	0.51	0.02	0.04	0.28	0.03
Control Delay	6.2	6.3	2.6	2.6	34.7	0.2	42.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	6.3	2.6	2.6	34.7	0.2	42.4	0.2
Queue Length 50th (m)	0.9	32.0	0.1	7.7	0.6	0.0	8.2	0.0
Queue Length 95th (m)	5.3	75.5	m0.5	28.7	2.8	0.0	15.8	0.0
Internal Link Dist (m)		246.9		340.0		61.8		113.2
Turn Bay Length (m)	30.0		77.2		6.0		6.7	
Base Capacity (vph)	248	2552	303	2553	375	482	374	465
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.45	0.02	0.51	0.01	0.02	0.12	0.02

Intersection Summary

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

Lane Group	EBT	WBT
Lane Group Flow (vph)	891	1137
v/c Ratio	0.28	0.38
Control Delay	3.0	3.6
Queue Delay	0.0	0.0
Total Delay	3.0	3.6
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	43.2	62.4
Internal Link Dist (m)	50.1	245.2
Turn Bay Length (m)		
Base Capacity (vph)	3495	3331
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.25	0.34

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	128	676	8	8	973	123	5	5	130	123
v/c Ratio	0.34	0.25	0.01	0.01	0.36	0.11	0.04	0.02	0.70	0.39
Control Delay	8.1	3.4	1.4	5.0	5.7	2.5	48.8	31.6	76.1	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	3.4	1.4	5.0	5.7	2.5	48.8	31.6	76.1	11.6
Queue Length 50th (m)	10.2	27.6	0.2	0.4	36.8	3.0	1.2	0.3	35.0	0.0
Queue Length 95th (m)	15.9	9.6	m0.3	2.2	61.4	10.0	5.0	4.1	53.3	16.7
Internal Link Dist (m)		652.4			611.6			74.7	463.8	
Turn Bay Length (m)	50.0		15.0	50.0		20.0				35.0
Base Capacity (vph)	380	2674	1107	543	2726	1139	236	381	344	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.25	0.01	0.01	0.36	0.11	0.02	0.01	0.38	0.26

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	827	65	1121	31	29	28	24
v/c Ratio	0.05	0.28	0.13	0.37	0.27	0.18	0.23	0.15
Control Delay	6.1	5.3	1.9	2.2	62.3	26.8	60.6	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	5.3	1.9	2.2	62.3	26.8	60.6	25.0
Queue Length 50th (m)	0.4	22.0	0.4	3.6	8.4	1.9	7.6	1.1
Queue Length 95th (m)	5.8	91.1	7.3	89.5	16.5	10.5	15.4	9.0
Internal Link Dist (m)		256.4		386.3		255.5		146.0
Turn Bay Length (m)	40.0		50.0		15.0		15.0	
Base Capacity (vph)	369	2927	518	3001	306	394	322	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.28	0.13	0.37	0.10	0.07	0.09	0.06

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	11	889	42	1031	100	37	13
v/c Ratio	0.03	0.33	0.10	0.37	0.66	0.19	0.07
Control Delay	1.2	1.4	5.7	8.3	79.3	20.1	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	1.4	5.7	8.3	79.3	20.1	33.8
Queue Length 50th (m)	0.2	2.1	4.3	71.6	27.0	0.8	1.3
Queue Length 95th (m)	m0.5	4.8	6.2	98.1	44.4	11.0	7.5
Internal Link Dist (m)		225.8		420.2	316.2		59.0
Turn Bay Length (m)	15.0		30.0			15.0	
Base Capacity (vph)	363	2673	431	2781	231	284	287
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.33	0.10	0.37	0.43	0.13	0.05

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	197	818	3	833	38	109	155
v/c Ratio	0.38	0.29	0.01	0.35	0.20	0.68	0.48
Control Delay	6.1	1.4	2.7	3.3	47.9	79.1	12.8
Queue Delay	0.4	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	1.7	2.7	3.3	47.9	79.1	12.8
Queue Length 50th (m)	4.9	12.6	0.1	14.3	7.9	29.4	0.0
Queue Length 95th (m)	m16.3	m10.3	m0.3	17.0	17.9	47.2	19.2
Internal Link Dist (m)		47.4		225.8	76.5	225.2	
Turn Bay Length (m)	15.0		25.0				60.0
Base Capacity (vph)	520	2803	438	2401	322	281	444
Starvation Cap Reductn	81	1247	0	0	0	0	0
Spillback Cap Reductn	0	0	0	138	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.53	0.01	0.37	0.12	0.39	0.35

Intersection Summary

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

Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	817	9	903	29	320
v/c Ratio	0.32	0.02	0.36	0.12	0.92
Control Delay	7.8	3.1	5.5	32.6	77.8
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	7.8	3.1	5.8	32.6	77.8
Queue Length 50th (m)	58.7	0.3	54.7	4.0	73.0
Queue Length 95th (m)	40.0	m0.8	17.8	12.9	#125.1
Internal Link Dist (m)	219.5		47.4	341.2	18.8
Turn Bay Length (m)		15.0			
Base Capacity (vph)	2517	408	2524	267	366
Starvation Cap Reductn	0	0	879	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.02	0.55	0.11	0.87

Intersection Summary

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

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

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	42	982	15	1092	42	35	82
v/c Ratio	0.11	0.35	0.04	0.37	0.32	0.28	0.40
Control Delay	3.9	4.2	2.3	2.4	48.1	63.1	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	4.2	2.3	2.4	48.1	63.1	16.5
Queue Length 50th (m)	0.2	2.1	0.4	17.9	7.6	9.5	0.0
Queue Length 95th (m)	7.4	104.8	m1.7	28.5	17.6	18.6	14.5
Internal Link Dist (m)		199.8		219.5	58.3	80.4	
Turn Bay Length (m)	25.0		25.0				
Base Capacity (vph)	367	2774	426	2928	310	318	392
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.35	0.04	0.37	0.14	0.11	0.21

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	1237	81	1365	67	92	13	19
v/c Ratio	0.07	0.48	0.31	0.53	0.36	0.32	0.07	0.08
Control Delay	5.5	4.5	16.7	14.6	55.5	15.6	45.1	22.7
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	5.5	4.5	16.7	14.8	55.5	15.6	45.1	22.7
Queue Length 50th (m)	0.4	18.8	9.3	99.2	18.1	4.1	3.4	1.3
Queue Length 95th (m)	m1.2	43.0	27.1	158.2	28.2	17.4	8.4	7.7
Internal Link Dist (m)		207.1		199.8		173.7		112.3
Turn Bay Length (m)	35.0		40.0		50.0		50.0	
Base Capacity (vph)	222	2557	261	2566	382	520	366	476
Starvation Cap Reductn	0	0	0	355	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.48	0.31	0.62	0.18	0.18	0.04	0.04

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	358	860	50	258	759	407	100	474	114	390	518	245
v/c Ratio	0.82	0.77	0.11	0.74	0.84	0.60	0.37	0.78	0.32	0.89	0.48	0.40
Control Delay	66.6	42.7	24.5	53.8	55.3	13.0	28.4	64.4	10.1	52.7	39.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	42.7	24.5	53.8	55.3	13.0	28.4	64.4	10.1	52.7	39.4	5.5
Queue Length 50th (m)	84.6	76.1	3.8	48.8	112.1	13.3	16.0	66.8	0.0	76.6	59.8	0.0
Queue Length 95th (m)	#138.0	#151.1	14.0	#86.5	#146.8	46.2	25.1	81.6	15.8	#114.3	71.3	17.2
Internal Link Dist (m)		401.7			97.9			650.8			510.4	
Turn Bay Length (m)	105.0		30.0	65.0		100.0	50.0		100.0	60.0		60.0
Base Capacity (vph)	436	1123	449	355	906	674	277	804	432	454	1316	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.77	0.11	0.73	0.84	0.60	0.36	0.59	0.26	0.86	0.39	0.35

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	706	152	131	716	7	132	62	97	474
v/c Ratio	0.11	0.41	0.19	0.30	0.35	0.01	1.00	0.12	0.23	0.73
Control Delay	20.9	23.3	8.5	9.3	8.8	4.0	125.3	10.4	36.8	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	23.3	8.5	9.3	8.8	4.0	125.3	10.4	36.8	29.3
Queue Length 50th (m)	5.7	63.8	7.8	6.1	22.9	0.1	36.2	1.3	19.6	64.4
Queue Length 95th (m)	13.2	82.5	21.0	m9.5	34.1	m0.2	#79.3	11.7	21.2	96.3
Internal Link Dist (m)		384.5			401.7			130.8		103.0
Turn Bay Length (m)	30.0		30.0	15.0						
Base Capacity (vph)	355	1740	792	470	2059	903	134	535	432	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.41	0.19	0.28	0.35	0.01	0.99	0.12	0.22	0.72

Intersection Summary

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

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

Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	950	32	1187	12	45	14
v/c Ratio	0.35	0.08	0.43	0.06	0.19	0.06
Control Delay	4.5	4.8	5.1	24.7	12.5	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	4.8	5.1	24.7	12.5	15.5
Queue Length 50th (m)	23.7	1.2	32.5	1.1	0.5	0.2
Queue Length 95th (m)	33.5	3.9	45.4	5.5	8.4	4.7
Internal Link Dist (m)	1201.8		384.5		397.9	57.0
Turn Bay Length (m)		40.0				
Base Capacity (vph)	3392	521	3428	718	784	797
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.06	0.35	0.02	0.06	0.02

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	179	519	97	775	402	99	312	69	352	258	186
v/c Ratio	0.47	0.27	0.27	0.50	0.46	0.63	0.60	0.24	0.72	0.22	0.29
Control Delay	18.4	16.4	27.7	27.7	4.5	65.0	52.0	11.4	57.2	27.9	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	16.4	27.7	27.7	4.5	65.0	52.0	11.4	57.2	27.9	4.4
Queue Length 50th (m)	18.5	32.2	14.4	68.2	0.0	22.5	37.0	0.0	41.1	23.1	0.0
Queue Length 95th (m)	38.3	53.9	32.1	100.8	21.2	37.6	47.0	11.8	55.0	27.8	12.8
Internal Link Dist (m)		479.0		1201.8			922.2			534.5	
Turn Bay Length (m)	80.0		55.0		190.0	70.0		40.0	45.0		55.0
Base Capacity (vph)	384	1895	364	1553	882	232	775	390	594	1536	769
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.27	0.27	0.50	0.46	0.43	0.40	0.18	0.59	0.17	0.24

Intersection Summary

Appendix D

Safety Assessment

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Memo

Date:	Wednesday, July 27, 2016
Project:	Lakeshore Connecting Communities
To:	Mark VanderSluis (City of Mississauga)
From:	HDR
Subject:	Lakeshore Collisions Analysis Memorandum

This memo documents the safety review for Lakeshore Connecting Communities, the Transportation Master Plan and Implementation Strategy for Lakeshore Road from the east City limit to Southdown Road and Royal Windsor Drive from Southdown Road to the west City limit. The City has provided intersection-related collision records for the most recent 5 years between 2009 and 2013 along the Lakeshore study corridor. Collisions reported with classification of 'Non-reportable' are assumed to be 'Property Damage Only' (PDO), as more severe collisions resulting in injury would be classifed as such. There was a total of 904 intersection collisions occurred along the study corridor within the five-year review period.

Collision Rates

Collision rates were calculated separately for intersections and segments using the following formulas:

$$Intersection\ Collision\ Rate = \frac{Number\ of\ Collisions\ \times 1{,}000{,}000}{AADT\ \times 365\ \times Years}$$

In addition to collision rates, we have also compared results from Regional Safety Study titled, *Development of Safety Performance Functions and Network Screening Final Report* which looked at 587 intersection and 777 segments (non-intersection). These results from the Regional study show where intersections or segments within this study are in comparison to other intersections and segments within the region from a safety perspective. The two parameters extracted from the Regional study are Potential for Safety Improvement (PSI) and PSI Ranking. A higher PSI Ranking indicates a high potential for safety improvement.

The PSI is the outcome from a network screening analysis which is a process for reviewing a roadway network (intersections, segments, ramps) in order to prioritize sites (for improvement) from highest to lowest. A network screening process involves several analytical steps utilizing historical data of the network (primarily collision history). For instance, the intersection of Lakeshore Rd and Winston Churchill Blvd has the highest PSI of 1.53 and ranks 240 (highest within our study corridor). From a network screening analysis, this site has the highest potential for safety improvement from the list of all intersections along the Lakeshore study corridor.

Annual Average Daily Traffic (AADT) was estimated by multiplying the sum of the AM and PM peak hour volumes by five, and then adding together the total entering traffic volume. The peak hour volumes were obtained from turning movement count data provided by City of Mississauga. There are only 3 intersections within the study corridor that were included in the Region's network screening analysis; PSI and ranks for other intersections are not available. The intersection collision rates are provided in **Table 1.**

Table 1: Intersections Collision Rate

Intersection	AADT	Number of Collisions	Intersection Collision Rate	Network Screening	
				PSI	Rank
Alexandra	20720	22	0.58	N/A	N/A
Ann	22395	1	0.02	N/A	N/A
Aviation	N/A	2	N/A	N/A	N/A
Avonhead	26730	5	0.10	N/A	N/A
Balboa	N/A	2	N/A	N/A	N/A
Beechwood	27090	2	0.04	N/A	N/A
Benson	23590	7	0.16	N/A	N/A
Bexhill	N/A	5	N/A	N/A	N/A
Brant	N/A	5	N/A	N/A	N/A
Briarwood	N/A	8	N/A	N/A	N/A
Broadview	16515	6	0.20	N/A	N/A
Caven	26120	11	0.23	N/A	N/A
Cawthra	**24425**	**6**	**0.13**	**0**	**472**
Cayuga	N/A	2	N/A	N/A	N/A
Clarkson N	20710	35	0.93	N/A	N/A
Clarkson S	22110	11	0.27	N/A	N/A
Crozier	N/A	1	N/A	N/A	N/A
Cumberland	22115	12	0.30	N/A	N/A
Deta	N/A	9	N/A	N/A	N/A
Dixie	**25030**	**2**	**0.04**	**0**	**473**
East	17305	10	0.32	N/A	N/A
Elizabeth	25610	36	0.77	N/A	N/A
Elmwood	20405	6	0.16	N/A	N/A
Enola	25865	9	0.19	N/A	N/A
Fergus	23645	3	0.07	N/A	N/A
Festavon	N/A	4	N/A	N/A	N/A
Front	27300	26	0.52	N/A	N/A
Greaves	N/A	2	N/A	N/A	N/A
Haig	19875	11	0.30	N/A	N/A
Hampton	N/A	6	N/A	N/A	N/A
Helene	23465	13	0.30	N/A	N/A
Hiawatha/Mohawk	22740	11	0.27	N/A	N/A

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Intersection	AADT	Number of Collisions	Intersection Collision Rate	Network Screening	
				PSI	Rank
Hurontario	32120	67	1.14	N/A	N/A
Hydro	19215	3	0.09	N/A	N/A
Ibar Way	19680	15	0.42	N/A	N/A
Inverhouse	25900	12	0.25	N/A	N/A
John	24620	12	0.27	N/A	N/A
Lakefront Promenade	22975	12	0.29	N/A	N/A
Lorne Park/Tennyson	21010	23	0.60	N/A	N/A
Maple	21780	12	0.30	N/A	N/A
Meadow Wood	20015	17	0.47	N/A	N/A
Meredith	N/A	2	N/A	N/A	N/A
Mississauga	33460	67	1.10	N/A	N/A
Ogden	24650	14	0.31	N/A	N/A
Orchard	N/A	5	N/A	N/A	N/A
Owenwood	19795	1	0.03	N/A	N/A
Pine	N/A	6	N/A	N/A	N/A
Porcupine	N/A	4	N/A	N/A	N/A
Rosewood	N/A	4	N/A	N/A	N/A
Seneca	28940	10	0.19	N/A	N/A
Shaw	29370	19	0.35	N/A	N/A
Southdown	40785	142	1.91	N/A	N/A
St. Lawrence	N/A	3	N/A	N/A	N/A
Strathy	N/A	2	N/A	N/A	N/A
Walden Circle	N/A	5	N/A	N/A	N/A
Wenonah	22130	11	0.27	N/A	N/A
Wesley	N/A	6	N/A	N/A	N/A
West	N/A	6	N/A	N/A	N/A
Westmount	N/A	2	N/A	N/A	N/A
Whittier	N/A	2	N/A	N/A	N/A
Winston Churchill	**31050**	**7**	**0.12**	**1.53**	**240**
Woodlawn	N/A	5	N/A	N/A	N/A
Ben Machree	N/A	6	N/A	N/A	N/A
Silver Birch	20425	13	0.35	N/A	N/A
Stavebank	30690	73	1.30	N/A	N/A
Unknown	N/A	9	N/A	N/A	N/A
Johnsons	19375	2	0.06	N/A	N/A
West/Montbeck	21670	2	0.05	N/A	N/A
Oakwood N	N/A	1	N/A	N/A	N/A
Roosevelt	N/A	2	N/A	N/A	N/A
Shawnmarr	22040	9	0.22	N/A	N/A

The locations with the highest number of collisions also have the highest collision rates. The intersection with the highest collision rate is Southdown Road.

The intersection with the highest PSI ranking is Lakeshore Road at Winston Churchill Boulevard.

Although no location in the Study Area ranks in the top 200 locations in Peel Region, this does not preclude the need to consider safety improvements.

Collisions by Year, Day of the Week, and Month

The number of collisions by year and severity is shown in **Table 2**. Overall, the number of collisions has increased moderately from year to year (except a slight decrease in 2012). The number of 'Property Damage Only' collisions have increased throughout the five-year review period, while the number of 'Non-Fatal Injury' collisions have remained constant. The reason for the increase in the number of collisions cannot be determined; possible reasons for the increase include random variation and weather.

Table 2: Collisions by Severity and Year (January 2009 to December 2013)

Intersection	2009	2010	2011	2012	2013	Total	Percentage
PDO only	133	144	168	138	160	743	82%
Non-fatal injury	27	33	32	30	37	159	18%
Fatal injury	-	1	1	-	-	2	0%
Total	160	178	201	168	197	904	100%
Percentage	18%	20%	22%	19%	22%	100%	

Note: '-'indicates that zero (0) collisions occurred

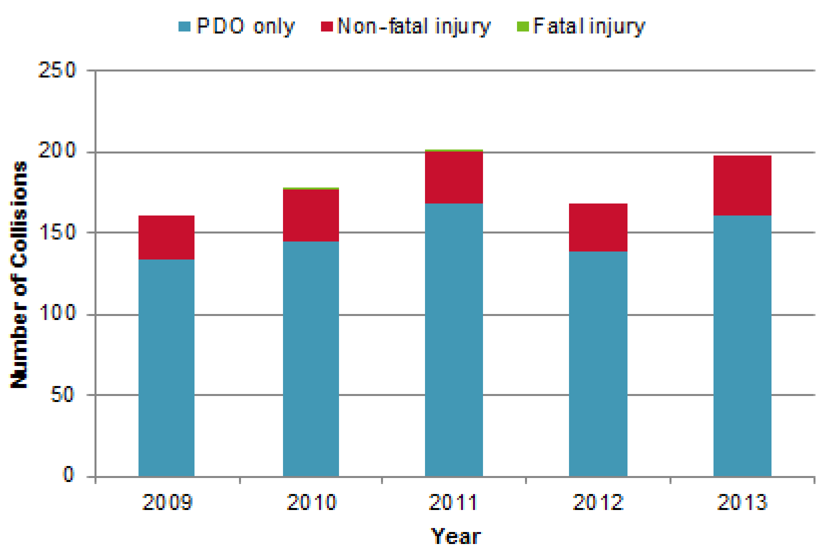

Figure 1: Collision by Severity and Year (January 2006 to December 2010)

The number of collisions by day of the week and severity is provided in **Table 3** and **Figure 2**. The highest number of collisions occur in the middle of the week on Wednesday, Thursday and Friday which correlate with typical commuting traffic patterns.

Table 3: Collisions by Severity and Weekday

Intersection	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	Percentage
PDO only	99	100	140	116	128	100	60	743	82%
Non-fatal injury	21	22	27	29	22	22	16	159	18%
Fatal injury	1	-	-	-	1	-	-	2	0%
Total	**121**	**122**	**167**	**145**	**151**	**122**	**76**	**904**	**100%**
Percentage	**13%**	**13%**	**18%**	**16%**	**17%**	**13%**	**8%**	**100%**	

Note: '-'indicates that zero (0) collisions occurred

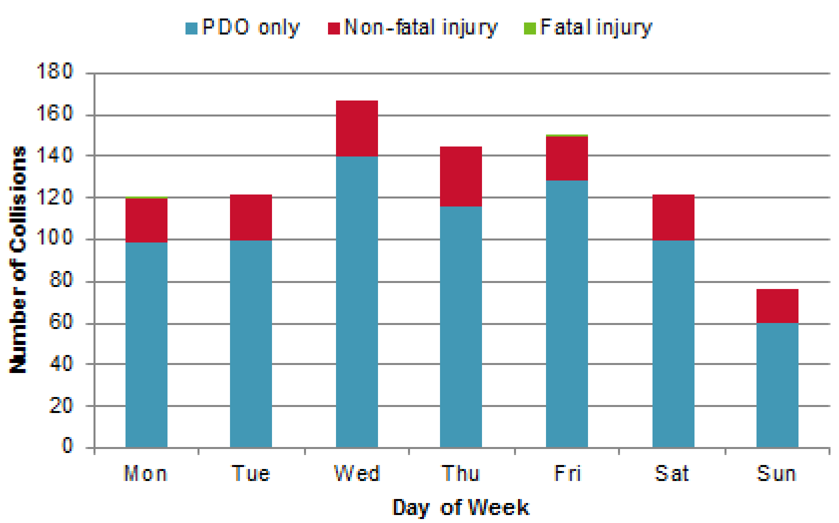

Figure 2: Collision by Severity and Weekday

The number of collisions by month and severity is provided in **Table 4** and **Figure 3**. The collision frequencies by month is fairly evenly distributed with the highest number fo collisions occurred during April and June. January and February have the lowest numbers of collisions.

Table 4: Collisions by Severity and Month

Severity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
PDO only	50	51	69	72	65	70	55	68	59	57	73	54	**743**	**82%**
Non-fatal injury	6	6	10	13	15	16	15	15	20	20	9	14	**159**	**18%**
Fatal injury	1	-	-	-	-	-	-	-	-	-	1	-	**2**	**0%**
Total	**57**	**57**	**79**	**85**	**80**	**86**	**70**	**83**	**79**	**77**	**83**	**68**	**904**	**100%**
%	**6%**	**6%**	**9%**	**9%**	**9%**	**10%**	**8%**	**9%**	**9%**	**9%**	**9%**	**8%**	**100%**	

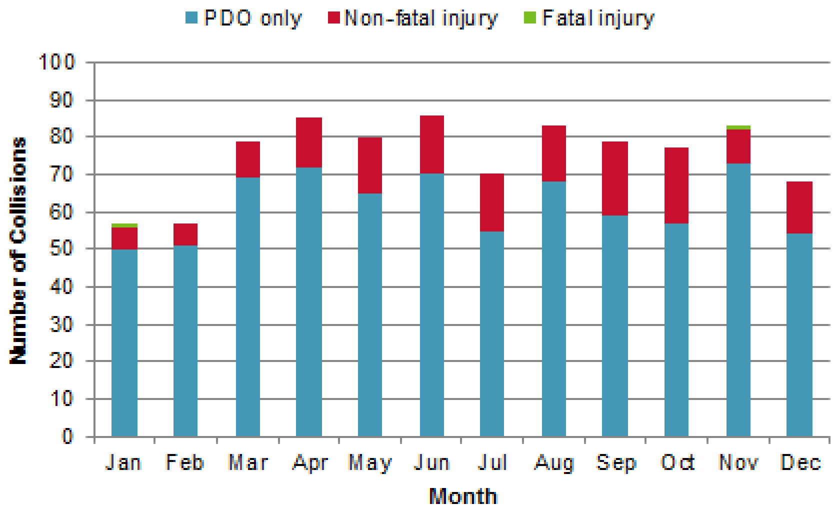

Figure 3: Collisions by Severity and Month

Collisions by Severity

The distribution of collisions by severity within the study area is summarized in **Table 5** and **Figure 4.** The majority of collisions within the study area are 'Property Damage Only' (82.2%), and the remainder are 'Non-Fatal Injury' collisions (17.6%). There are 2 fatal collisions (0.2%) occurred within the five-year review period which will be analyzed in more detail. The number of 'Non-Fatal Injury' collisions is not particularly high, and the collisions occurred in an even distribution along the entire study area, indicating that no locations were particularly susceptible to injury collisions.

The location at which collisions occurred is relatively distributed along the entire corridor, with the exception of one location with the highest number of collisions occurred within the review period:

- Lakeshore Road at Southdown Road

In addition, three other locations had a moderate number of collisions, including:

- Lakeshore Road at Hurontario Road
- Lakeshore Road at Mississauga Road
- Lakeshore Road at Stavebank Road

Table 5: Collisions by Severity and Location

Location	PDO only	Non-fatal Injury	Fatal Injury	Grand Total	%
Alexandra	14	7	1	**22**	**2%**
Ann	-	1		**1**	**0%**
Aviation	2	-	-	**2**	**0%**

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Location	PDO only	Non-fatal Injury	Fatal Injury	Grand Total	%
Avonhead	5	-	-	**5**	**1%**
Balboa	2	-	-	**2**	**0%**
Beechwood	2	-	-	**2**	**0%**
Benson	6	1	-	**7**	**1%**
Bexhill	4	1	-	**5**	**1%**
Brant	5	-	-	**5**	**1%**
Briarwood	6	1	1	**8**	**1%**
Broadview	6	-	-	**6**	**1%**
Caven	10	1	-	**11**	**1%**
Cawthra	4	2	-	**6**	**1%**
Cayuga	2	-	-	**2**	**0%**
Clarkson N	30	5	-	**35**	**4%**
Clarkson S	10	1	-	**11**	**1%**
Crozier	1	-	-	**1**	**0%**
Cumberland	10	2	-	**12**	**1%**
Deta	5	4	-	**9**	**1%**
Dixie	1	1	-	**2**	**0%**
East	8	2	-	**10**	**1%**
Elizabeth	29	7	-	**36**	**4%**
Elmwood	6	-	-	**6**	**1%**
Enola	5	4	-	**9**	**1%**
Fergus	2	1	-	**3**	**0%**
Festavon	4	-	-	**4**	**0%**
Front	21	5	-	**26**	**3%**
Greaves	1	1	-	**2**	**0%**
Haig	7	4	-	**11**	**1%**
Hampton	6	-	-	**6**	**1%**
Helene	11	2	-	**13**	**1%**
Hiawatha/Mohawk	8	3	-	**11**	**1%**
Hurontario	56	11	-	**67**	**7%**
Hydro	2	1	-	**3**	**0%**
Ibar Way	12	3	-	**15**	**2%**
Inverhouse	11	1	-	**12**	**1%**
John	8	4	-	**12**	**1%**
Lakefront Promenade	10	2	-	**12**	**1%**
Lorne Park/Tennyson	18	5	-	**23**	**3%**
Maple	10	2	-	**12**	**1%**
Meadow Wood	12	5	-	**17**	**2%**
Meredith	2	-	-	**2**	**0%**
Mississauga	61	6	-	**67**	**7%**
Ogden	12	2	-	**14**	**2%**
Orchard	5	-	-	**5**	**1%**
Owenwood	1	-	-	**1**	**0%**

Location	PDO only	Non-fatal Injury	Fatal Injury	Grand Total	%
Pine	5	1	-	**6**	**1%**
Porcupine	3	1	-	**4**	**0%**
Rosewood	4	-	-	**4**	**0%**
Seneca	8	2	-	**10**	**1%**
Shaw	14	5	-	**19**	**2%**
Southdown	118	24	-	**142**	**16%**
St. Lawrence	2	1	-	**3**	**0%**
Strathy	2	-	-	**2**	**0%**
Walden Circle	2	3	-	**5**	**1%**
Wenonah	10	1	-	**11**	**1%**
Wesley	5	1	-	**6**	**1%**
West	5	1	-	**6**	**1%**
Westmount	2	-	-	**2**	**0%**
Whittier	2	-	-	**2**	**0%**
Winston Churchill	5	2	-	**7**	**1%**
Woodlawn	3	2	-	**5**	**1%**
Ben Machree	4	2	-	**6**	**1%**
Silver Birch	11	2	-	**13**	**1%**
Stavebank	65	8	-	**73**	**8%**
Unknown	9	-	-	**9**	**1%**
Johnsons	2	-	-	**2**	**0%**
West/Montbeck	2	-	-	**2**	**0%**
Oakwood N	1	-	-	**1**	**0%**
Roosevelt	1	1	-	**2**	**0%**
Shawnmarr	5	4	-	**9**	**1%**
Grand Total	**743**	**159**	**2**	**904**	**100%**
Percentage	**82%**	**18%**	**0.2%**	**100%**	

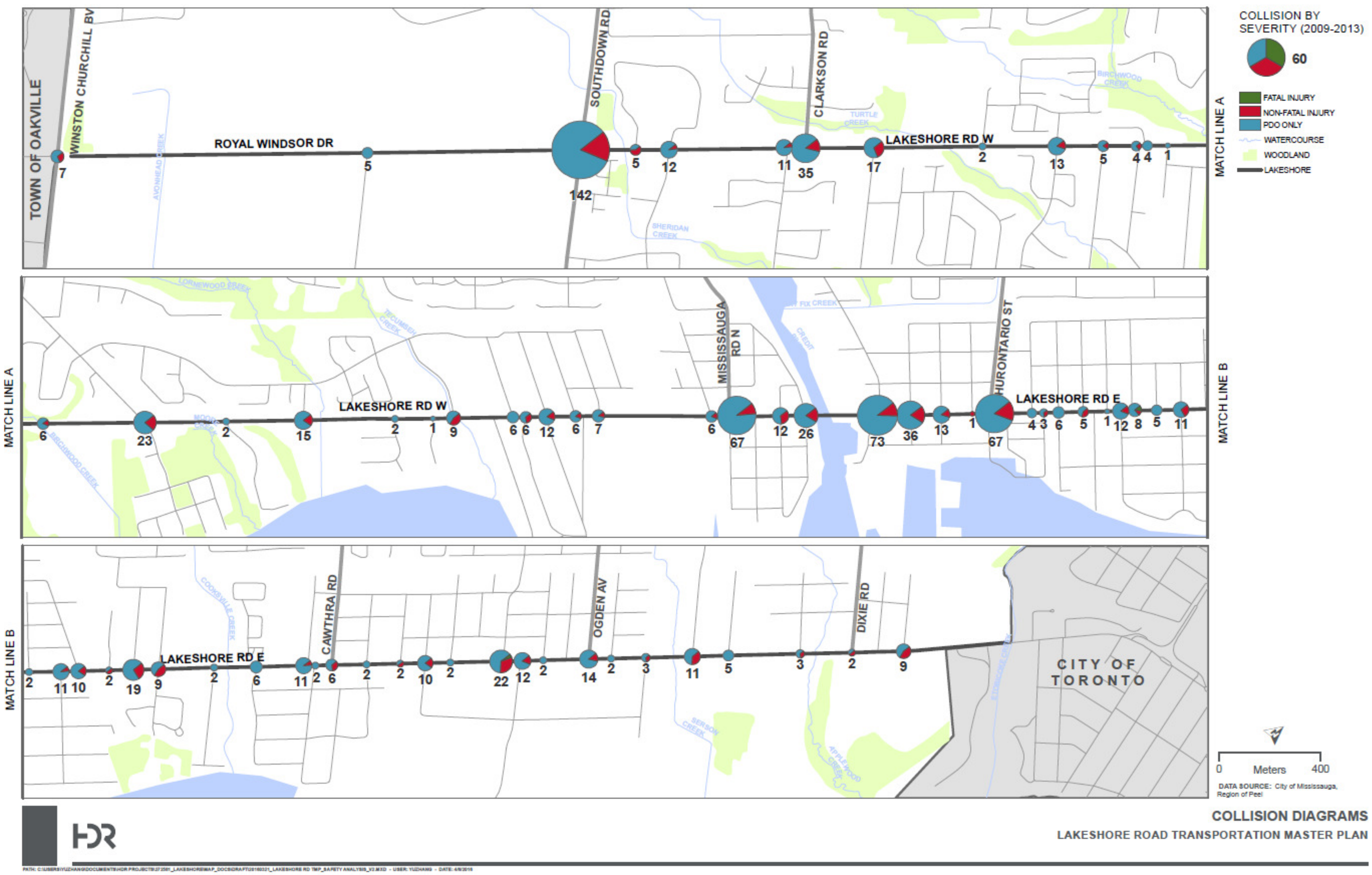

Figure 4: Collisions by Severity and Location

Collisions by Initial Impact Type

The distribution of collisions by initial impact type and location is listed in **Table 6**. Rear-end collisions (37%), accounted for the highest percentage of all collisions, followed by angle collisions at 18% and turning collisions at 16%. The remaining 29% of collisions involved a combination of sideswipe (12%), approaching (10%), Unclassified (5%) and single-motor-vehicle (2%) collisions. The analysis of initial impact type indicates that majority of the rear-end collision occurred in eastbound and westbound directions, which is consistent with the high traffic volumes on Lakeshore Road.

Table 6: Collisions by Initial Impact Type and Location

Intersection	Angle	Approaching	Rear end	Sideswipe	SMV	Turning	Unclassified	Total	%
Alexandra	9	6		2	0	4	1	**22**	**2%**
Ann					0	1	0	**1**	**0%**
Aviation					0	2	0	**2**	**0%**
Avonhead		1	3		0	1	0	**5**	**1%**
Balboa			2		0		0	**2**	**0%**
Beechwood		2			0		0	**2**	**0%**
Ben Machree	1		4		0	1	0	**6**	**1%**
Benson	1	2	1	1	0	1	1	**7**	**1%**
Bexhill			2	2	0	1	0	**5**	**1%**
Brant	1	2			0	1	1	**5**	**1%**
Briarwood	2		1	2	1	2	0	**8**	**1%**
Broadview	2		3		1		0	**6**	**1%**
Caven	3	1	1	2	0	3	1	**11**	**1%**
Cawthra	4		1	1	0		0	**6**	**1%**
Cayuga				1	0	1	0	**2**	**0%**
Clarkson N	8	1	12	4	1	7	2	**35**	**4%**
Clarkson S	3	1	6		0	1	0	**11**	**1%**
Crozier				1	0		0	**1**	**0%**
Cumberland	1		6	1	1	2	1	**12**	**1%**
Deta	2	2	2		0	3	0	**9**	**1%**
Dixie			1		0	1	0	**2**	**0%**
East	2	1	1	4	0	2	0	**10**	**1%**
Elizabeth	4	4	14	6	0	7	1	**36**	**4%**
Elmwood	2	1	2	1	0		0	**6**	**1%**
Enola	4	1			0	4	0	**9**	**1%**
Fergus	1	1	1		0		0	**3**	**0%**
Festavon			4		0		0	**4**	**0%**
Front	4	2	11	3	1	5	0	**26**	**3%**
Greaves	1			1	0		0	**2**	**0%**
Haig	4	1	2		1	1	2	**11**	**1%**
Hampton	1	2	2		0	1	0	**6**	**1%**
Helene	1		8		0	4	0	**13**	**1%**
Hiawatha/Mohawk	1		4	3	0	3	0	**11**	**1%**

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Intersection	Angle	Approaching	Rear end	Sideswipe	SMV	Turning	Unclassified	Total	%
Hurontario	11	6	24	8	2	11	5	**67**	**7%**
Hydro	1		2		0		0	**3**	**0%**
Ibar Way	1	3	7	1	0	2	1	**15**	**2%**
Inverhouse	1	1	3		0	4	3	**12**	**1%**
John	3	1	3	1	1	3	0	**12**	**1%**
Johnsons			1		0	1	0	**2**	**0%**
Lakefront Promenade	2		9		0	1	0	**12**	**1%**
Lorne Park/Tennyson	3	1	10	1	2	5	1	**23**	**3%**
Maple	2	1	7		0	2	0	**12**	**1%**
Meadow Wood	1	4	4	3	0	3	2	**17**	**2%**
Meredith				1	0	1	0	**2**	**0%**
Mississauga	8	10	32	8	0	8	1	**67**	**7%**
Oakwood N			1		0		0	**1**	**0%**
Ogden	3	3	3	3	0		2	**14**	**2%**
Orchard		1	1	1	0	1	1	**5**	**1%**
Owenwood	1				0		0	**1**	**0%**
Pine	1		3	1	1		0	**6**	**1%**
Porcupine			1		0	3	0	**4**	**0%**
Roosevelt	1		1		0		0	**2**	**0%**
Rosewood	1		3		0		0	**4**	**0%**
Seneca	2	1	5		0	2	0	**10**	**1%**
Shaw	4	5	4	2	1	3	0	**19**	**2%**
Shawnmarr			5	3	0		1	**9**	**1%**
Silver Birch	1		8	2	0	1	1	**13**	**1%**
Southdown	33	13	55	13	5	16	7	**142**	**16%**
St. Lawrence	2		1		0		0	**3**	**0%**
Stavebank	12	4	17	18	0	17	5	**73**	**8%**
Strathy		2			0		0	**2**	**0%**
Walden Circle	3		2		0		0	**5**	**1%**
Wenonah	1	3	4	1	0	2	0	**11**	**1%**
Wesley	2		2	1	0	1	0	**6**	**1%**
West			5		0	1	0	**6**	**1%**
West/Montbeck	1				0		1	**2**	**0%**
Westmount			2		0		0	**2**	**0%**
Whittier			1	1	0		0	**2**	**0%**
Winston Churchill			4		1	1	1	**7**	**1%**
Woodlawn	2		1		0		2	**5**	**1%**
Unknown			6	2	0	1	0	**9**	**1%**
Total	**165**	**90**	**331**	**106**	**19**	**149**	**44**	**904**	
%	**18%**	**10%**	**37%**	**12%**	**2%**	**16%**	**5%**	**100%**	

Collisions by Environmental Conditions

The distribution of collisions by environmental condition and location is provided in **Table 7.** The majority of collisions have occurred under clear conditions (83%), followed by rain (11%), snow (4%) and other (2%). This distribution does not indicate a potential for safety improvement based on environmental conditions.

Table 7: Collisions by Environmental Condition and Location

Intersection	Clear	Rain	Snow	Drifting Snow	Fog	Freezing Rain	Other	Total	%
Alexandra	15	4	2	1				22	2%
Ann	1							1	0%
Aviation	2							2	0%
Avonhead	4		1					5	1%
Balboa	2							2	0%
Beechwood	2							2	0%
Ben Machree	6							6	1%
Benson	7							7	1%
Bexhill	4		1					5	1%
Brant	5							5	1%
Briarwood	5	2	1					8	1%
Broadview	5		1					6	1%
Caven	10	1						11	1%
Cawthra	6							6	1%
Cayuga	2							2	0%
Clarkson N	24	9	1				1	35	4%
Clarkson S	11							11	1%
Crozier	1							1	0%
Cumberland	12							12	1%
Deta	8	1						9	1%
Dixie	1				1			2	0%
East	8	1	1					10	1%
Elizabeth	30	3	1		1		1	36	4%
Elmwood	6							6	1%
Enola	7	2						9	1%
Fergus	3							3	0%
Festavon	4							4	0%
Front	23	2			1			26	3%
Greaves	2							2	0%
Haig	10	1						11	1%
Hampton	4	1	1					6	1%
Helene	12	1						13	1%
Hiawatha/Mohawk	9	2						11	1%
Hurontario	57	8	2					67	7%
Hydro	1	2						3	0%

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Ibar Way	13	1	1					15	2%
Inverhouse	11	1						12	1%
John	11	1						12	1%
Johnsons	2							2	0%
Lakefront Promenade	8	3	1					12	1%
Lorne Park/Tennyson	19	1	3					23	3%
Maple	11		1					12	1%
Meadow Wood	15	1	1					17	2%
Meredith	2							2	0%
Mississauga	52	12	1			1	1	67	7%
Oakwood N	1							1	0%
Ogden	12	1			1			14	2%
Orchard	3		2					5	1%
Owenwood			1					1	0%
Pine	5	1						6	1%
Porcupine	4							4	0%
Roosevelt	2							2	0%
Rosewood	2	2						4	0%
Seneca	9	1						10	1%
Shaw	16	2	1					19	2%
Shawnmarr	8	1						9	1%
Silver Birch	9	4						13	1%
Southdown	114	15	5		3	2	3	142	16%
St. Lawrence	3							3	0%
Stavebank	66	4	1			1	1	73	8%
Strathy	2							2	0%
Walden Circle	5							5	1%
Wenonah	6	2	1				2	11	1%
Wesley	4	2						6	1%
West	4		2					6	1%
West/Montbeck	2							2	0%
Westmount	2							2	0%
Whittier	2							2	0%
Winston Churchill	6	1						7	1%
Woodlawn	4						1	5	1%
Unknown	8	1						9	1%
Total	**752**	**97**	**33**	**1**	**0**	**4**	**10**	**904**	**100%**
%	**83%**	**11%**	**4%**	**0%**	**0%**	**0%**	**1%**		**0%**

Collisions by Light Conditions

The distribution of collisions by light condition and location is provided in **Table 8.** The majority of collisions have occurred under daylight conditions (77%), followed by dark (16%), dusk (4%), dawn (2%), and other (1%). The study corridor is located in an urban setting where the roads

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are properly illuminated. This distribution does not indicate a potential for safety improvement based on light conditions.

Table 8: Collisions by Light Condition and Location

Intersection	Daylight	Dark	Dusk	Dawn	Other	Total	%
Alexandra	16	6				**22**	**2%**
Ann		1				**1**	**0%**
Aviation	2					**2**	**0%**
Avonhead	3	2				**5**	**1%**
Balboa	2					**2**	**0%**
Beechwood	2					**2**	**0%**
Ben Machree	5				1	**6**	**1%**
Benson	6			1		**7**	**1%**
Bexhill	3	2				**5**	**1%**
Brant	3	1			1	**5**	**1%**
Briarwood	6	1	1			**8**	**1%**
Broadview	4	2				**6**	**1%**
Caven	8			3		**11**	**1%**
Cawthra	5			1		**6**	**1%**
Cayuga	2					**2**	**0%**
Clarkson N	27	5	2		1	**35**	**4%**
Clarkson S	9	1		1		**11**	**1%**
Crozier	1					**1**	**0%**
Cumberland	12					**12**	**1%**
Deta	7	1	1			**9**	**1%**
Dixie		1	1			**2**	**0%**
East	7	3				**10**	**1%**
Elizabeth	32	4				**36**	**4%**
Elmwood	6					**6**	**1%**
Enola	7	1	1			**9**	**1%**
Fergus	2	1				**3**	**0%**
Festavon	4					**4**	**0%**
Front	21	4			1	**26**	**3%**
Greaves	2					**2**	**0%**
Haig	8	2	1			**11**	**1%**
Hampton	5			1		**6**	**1%**
Helene	10	3				**13**	**1%**
Hiawatha/Mohawk	10	1				**11**	**1%**
Hurontario	49	10	6	2		**67**	**7%**
Hydro	2	1				**3**	**0%**
Ibar Way	13	2				**15**	**2%**
Inverhouse	7	4	1			**12**	**1%**
John	9	2		1		**12**	**1%**

Intersection	Daylight	Dark	Dusk	Dawn	Other	Total	%
Johnsons	2					**2**	**0%**
Lakefront Promenade	10	2				**12**	**1%**
Lorne Park/Tennyson	17	5		1		**23**	**3%**
Maple	9	2	1			**12**	**1%**
Meadow Wood	12	3	2			**17**	**2%**
Meredith	1	1				**2**	**0%**
Mississauga	50	14		2	1	**67**	**7%**
Oakwood N	1					**1**	**0%**
Ogden	10	4				**14**	**2%**
Orchard	4	1				**5**	**1%**
Owenwood	1					**1**	**0%**
Pine	5		1			**6**	**1%**
Porcupine	3	1				**4**	**0%**
Roosevelt	2					**2**	**0%**
Rosewood	4					**4**	**0%**
Seneca	8	1	1			**10**	**1%**
Shaw	12	4		3		**19**	**2%**
Shawnmarr	7	2				**9**	**1%**
Silver Birch	10	2	1			**13**	**1%**
Southdown	105	25	8	1	3	**142**	**16%**
St. Lawrence	2				1	**3**	**0%**
Stavebank	60	7	3	2	1	**73**	**8%**
Strathy	1	1				**2**	**0%**
Walden Circle	3	2				**5**	**1%**
Wenonah	6	5				**11**	**1%**
Wesley	6					**6**	**1%**
West	3	1	2			**6**	**1%**
West/Montbeck	2					**2**	**0%**
Westmount	1	1				**2**	**0%**
Whittier	2					**2**	**0%**
Winston Churchill	6	1				**7**	**1%**
Woodlawn	3	1			1	**5**	**1%**
(blank)	8	1				**9**	**1%**
Total	**693**	**148**	**33**	**19**	**11**	**904**	**100%**
Percentage	**77%**	**16%**	**4%**	**2%**	**1%**	**100%**	

Collision Prone Locations

As discussed in aforementioned sections, there are four identified locations with higher number of collisions compared to other intersections in the study corridor. These locations are further analyzed to determine any collision trends and patterns.

Southdown Rd and Lakeshore Rd W

This intersection is signalized with channelized right-turn lanes. The adjacent land uses are commercial plazas west of Southdown Road and low density residential buildings in the south-east corner. The intersection is also in proximity to Clarkson GO station with a large commuter parking lot. It had the highest number (142) of collisions compared to other intersections in the study corridor. There were 118 (or 83%) PDO and 24 (or 17%) non-fatal injury collisions. **Figure 5** shows the number of collisions by year and severity which an increase in collisions can be observed in 2011.

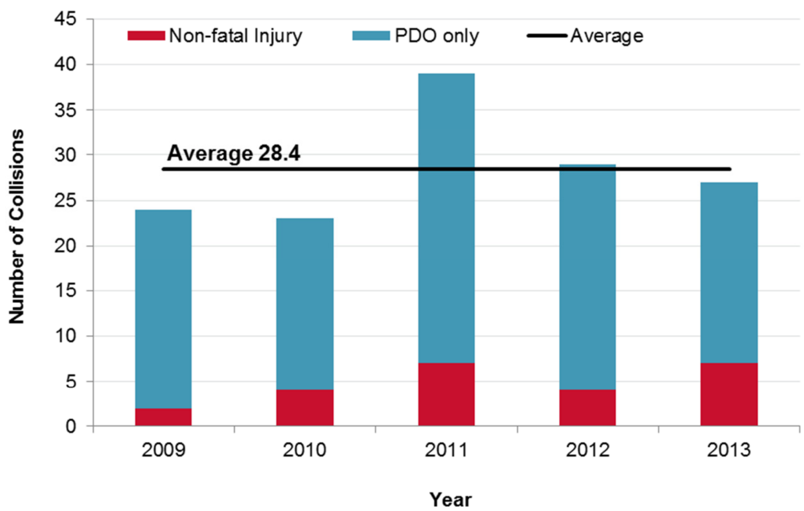

Figure 5: Collisions by Year and Severity (Southdown and Lakeshore)

Figure 6 shows the number of collisions by time of day and severity. The time of day distribution was quite evenly distributed and the highest number of collisions occurred during PM peak hour (4:00 pm to 5:00 pm).

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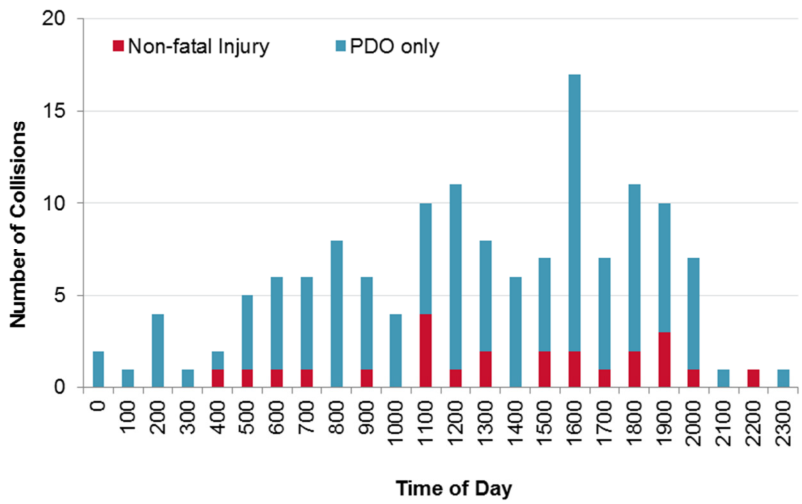

Figure 6: Collisions by Time of Day and Severity (Southdown and Lakeshore)

Figure 7 shows the break down of collisions by impact types. The predominant impact types were rear end (55 out of 142 or 39%) and angle collisions (33 out of 142 or, 23%).

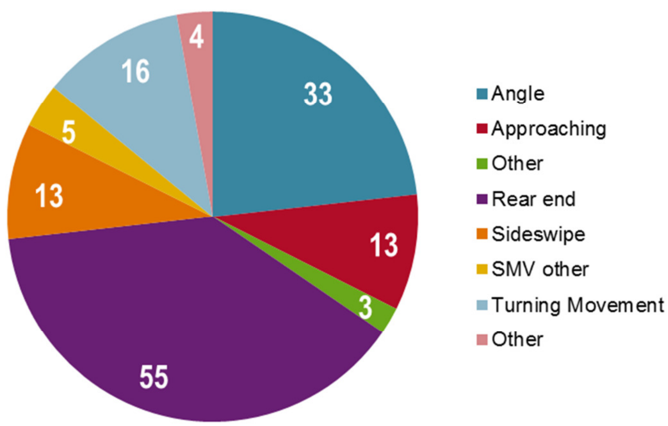

Figure 7: Collisions by Impact Type (Southdown and Lakeshore)

A detailed analysis of travel directions was performed to determine any patterns for the predominant impact types at the intersection. It was found that most of the rear-end collisions occurred in southbound and westbound directions as shown in **Table 9**.

Table 9: Vehicle 1 and 2's Travel Directions for Rear-End Collisions (Southdown & Lakeshore Road)

Travel Direction		Vehicle 2					
		EB	NB	SB	WB	Unspecified	Total
Vehicle 1	EB	5				4	16%
	NB		7			2	16%
	SB			8	1*	8	31%
	WB			2*	8	10	36%
	Total	9%	13%	18%	16%	44%	100%

*Rear-end collision typically involves two vehicles traveling in the same direction; this entry is likely a result of coding error in collision database.

A breakdown of travel directions for angle collisions is summarized in **Table 10**. Majority of the angle collisions involved southbound and westbound drivers.

Table 10: Vehicle 1 and 2's Travel Directions for Angle Collisions (Southdown & Lakeshore Road)

Travel Direction		Vehicle 2					
		EB	NB	SB	WB	Unspecified	Total
Vehicle 1	EB			1	2	2	15%
	NB	4			1		15%
	SB	5	1	1*	7	1	45%
	WB	1	1	1	1*	4	24%
	Total	30%	6%	9%	33%	21%	100%

*Angle collision typically involves two vehicles traveling in different directions; this entry is likely a result of coding error in collision database.

Stavebank Rd and Lakeshore Rd W

Stavebank Road and Lakeshore Road West is a jogged intersection with retail shops in close vicinity. There were 73 collisions at this intersection during the analysis period, where 65 (or 89%) were PDO and 8 (or 11%) were non-fatal injury collisions**. Figure 8** shows the number of collisions by year and severity. The intersection experienced an average of 14.6 collisions per year with moderate increases in 2010 and 2013.

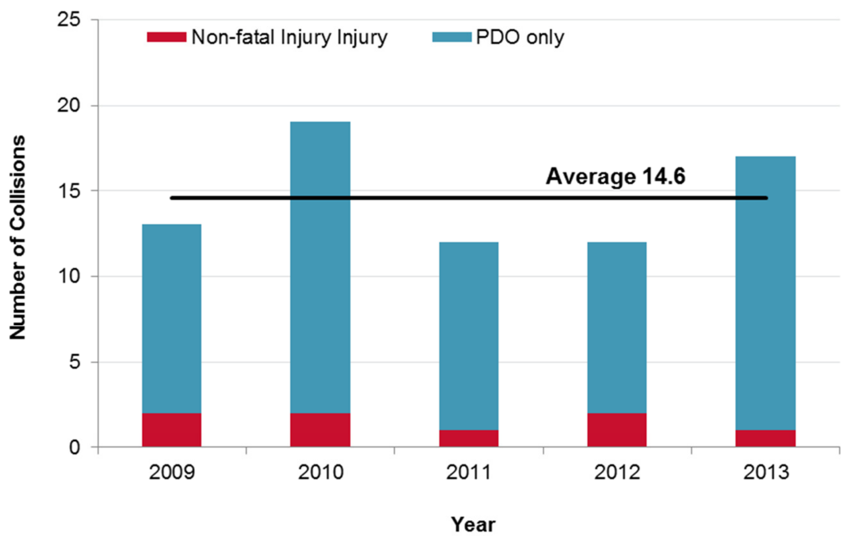

Figure 8: Collisions by Year and Severity (Stavebank and Lakeshore)

The number of collisions by time of day and severity are shown in **Figure 9**. Highest number of collisions occurred at noon (12:00 pm – 1:00 pm) and in the PM peak period (3:00 pm – 4:00 pm and 6:00 pm – 7:00 pm).

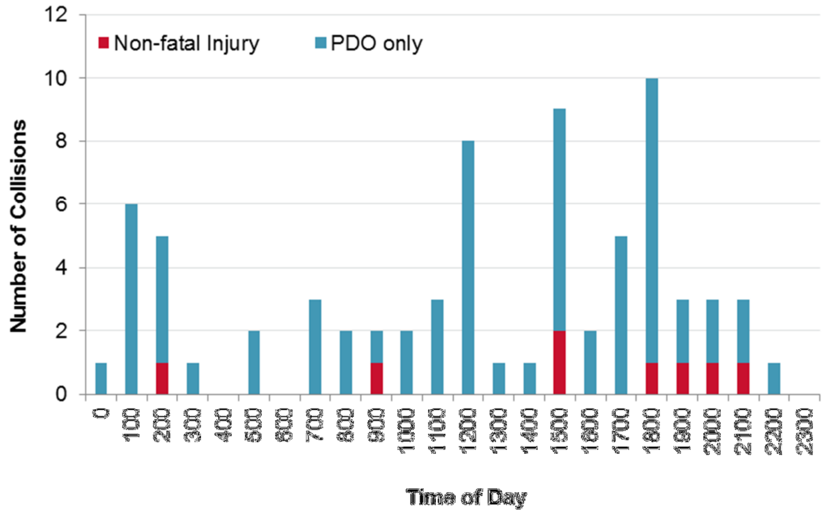

Figure 9: Collisions by Time of Day and Severity (Stavebank and Lakeshore)

As shown in **Figure 10**, the four predominant impact types at this intersection are sideswipe (18 collisions, 25%), rear end (17 collisions, 23%), turning movement (17 collisions, 23%), and angle (12 collisions 16%). It is noted that turning movement collisions involved a high number of eastbound and westbound drivers (6 collisions). There are no apparent patterns in the direction of travel for other impact types.

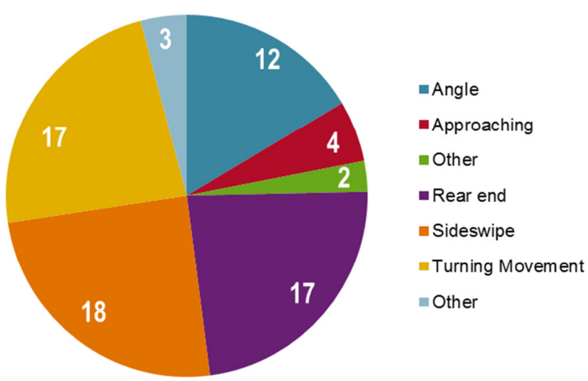

Figure 10: Collisions by Impact Type (Stavebank and Lakeshore)

Hurontario St / St Lawrence Dr and Lakeshore Rd E

Hurontatrio St / St Lawrence Dr and Lakeshore Rd E is a major intersection in the City of Mississauga, where Hurontario is a 5-lane and Lakeshore is a 6-lane major arterial. The primary land uses near the intersection are high-rise commercial / residential buildings and low-rise retail. There were 70 collisions at this intersection, with 58 collisions resulted in PDO (or 83%) and 12 non-fatal injury collisions (or 17%). There is a trend of increasing number of collisions from 2009 to 2013 as shown in **Figure 11**. This intersection experienced an average of 14 collisions per year with the highest numbers of collisions occurred in 2010 and 2013.

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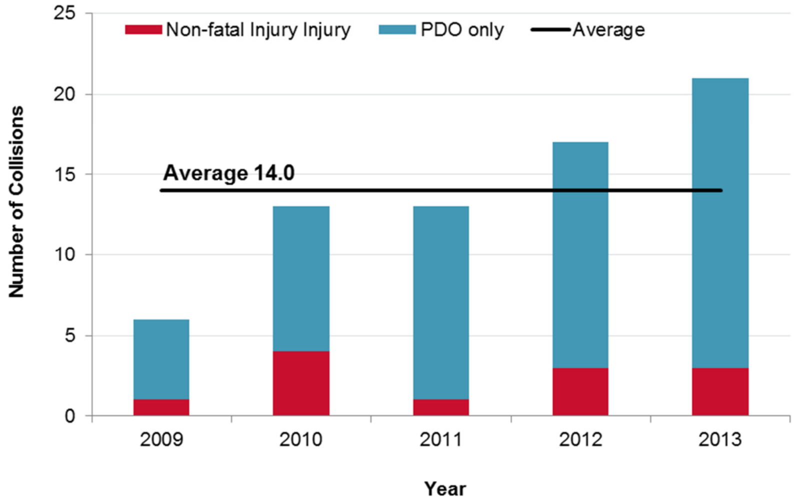

Figure 11: Collisions by Year and Severity (Hurontario and Lakeshore)

Collisions by time of day are presented in **Figure 12**. The AM and PM peak periods (9:00AM and between 3:00PM to 5:00PM) have the highest numbers of collisions where majority of the non-fatal collision occurred at 9:00AM.

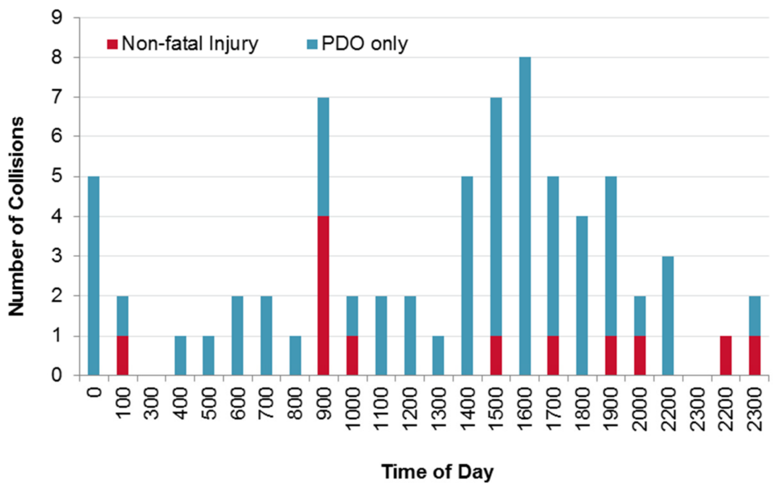

Figure 12: Collisions by Time of Day and Severity (Hurontario/St Lawrence and Lakeshore)

As shown in **Figure 13**, the predominant impact type was rear end, which included 25 collisions (36%). The major directions of travel for drivers in rear-end collisions were eastbound-eastbound (6 collisions) and westbound-westbound (5 collisions).

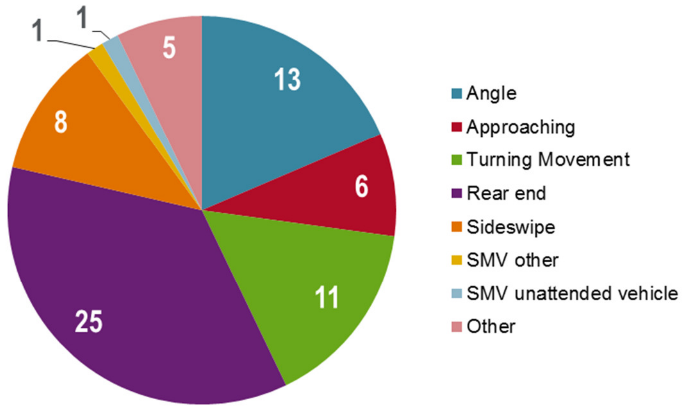

Figure 13: Collisions by Impact Type (Hurontario/St Lawrence and Lakeshore)

Mississauga Road and Lakeshore Road W

The Mississauga Road and Lakeshore Road is a signalized intersection is surrounded by mixed land uses with high density residential and some commercial area. There were 68 collisions at this intersection, of which 56 (or 84%) were PDO and 11 (or 16%) were non-fatal injury collisions. The number of collisions by year and severity is shown in **Figure 14.** The two years with the highest recorded collision for this location 2011 and 2012 with an average of 13.4 collisions per year**.** .

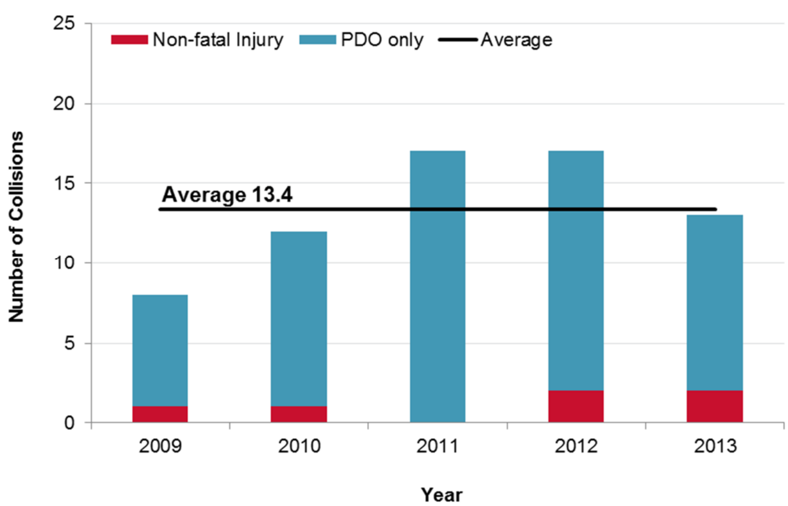

Figure 14: Collisions by Year and Severity (Mississauga and Lakeshore)

This intersection experienced highest numbers of collisions during the afternoon period, between 3:00 pm – 4:00 pm and 6:00 pm – 7:00 pm, as shown in **Figure 15.**

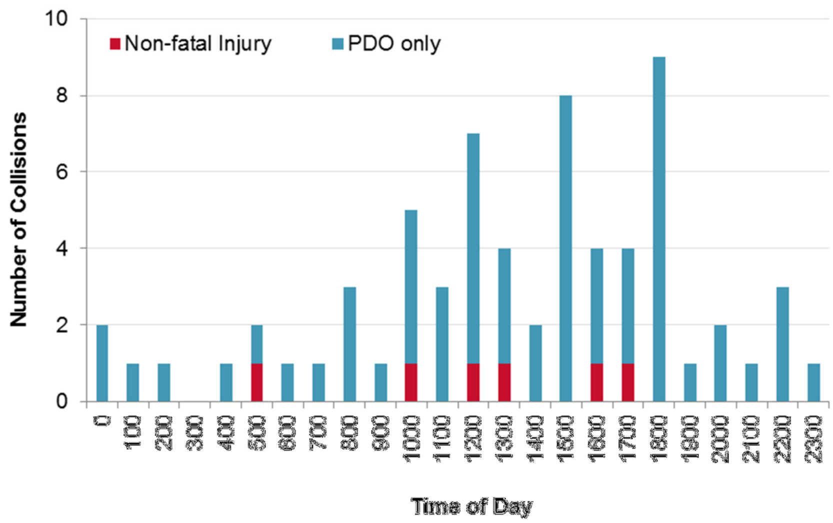

Figure 15: Collisions by Time of Day and Severity (Mississauga Rd and Lakeshore)

The predominant impact type was rear end collision, which included 32 collisions (48%) as shown in **Figure 16.** Majority of the rear-end collisions occurred in westbound directions.

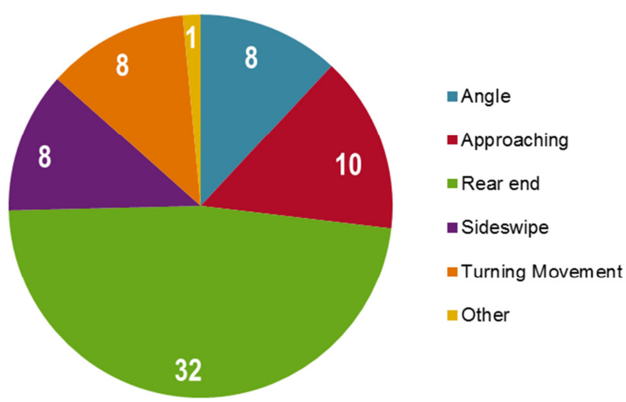

Figure 16: Collisions by Impact Type (Mississauga and Lakeshore)

Vulnerable-Users Related Collisions

Vulnerable users include pedestrians and cyclists. During the five-year study period there were a total of 47 collisions (out of 904) involving vulnerable users (including both auto-related and bus-related collisions). All collisions were pedestrian-related, and none of them included cyclists. Of these collisions, there was total of 35 (or 74%) injuries or fatalities.

Vulnerable-user related collisions based on year and location are summarized in **Table 11** and **Figure 17.** Hurontario St and Southdown Rd had the highest number of vulnerable-users related collisions (9 and 6 collisions respectively).

Table 11: Vulnerable User Related Collisions by Year and Location

Intersection	2009	2010	2011	2012	2013	Total	Average
Alexandra		1		1		2	0.4
Benson	1					1	0.2
Brant					1	1	0.2
Briarwood		1				1	0.2
Broadview		1				1	0.2
Cumberland			1		1	2	0.4
Deta			1			1	0.2
Elizabeth	1		1	1		3	0.6
Enola				1		1	0.2
Front					1	1	0.2
Hiawatha/Mohawk			3			3	0.6
Hurontario	1	2	1	2	3	9	1.8
John	1			1		2	0.4
Lakefront Promenade	1					1	0.2
Lorne Park/Tennyson					1	1	0.2
Meadow Wood		1				1	0.2
Mississauga	1			1		2	0.4
Ogden		1		1		2	0.4
Shaw					1	1	0.2
Southdown	1		4	1		6	1.2
Wenonah	1					1	0.2
Silver Birch		1				1	0.2
Stavebank			1	1		2	0.4
West/Montbeck					1	1	0.2
Grand Total	**8**	**8**	**12**	**10**	**9**	**47**	9.4

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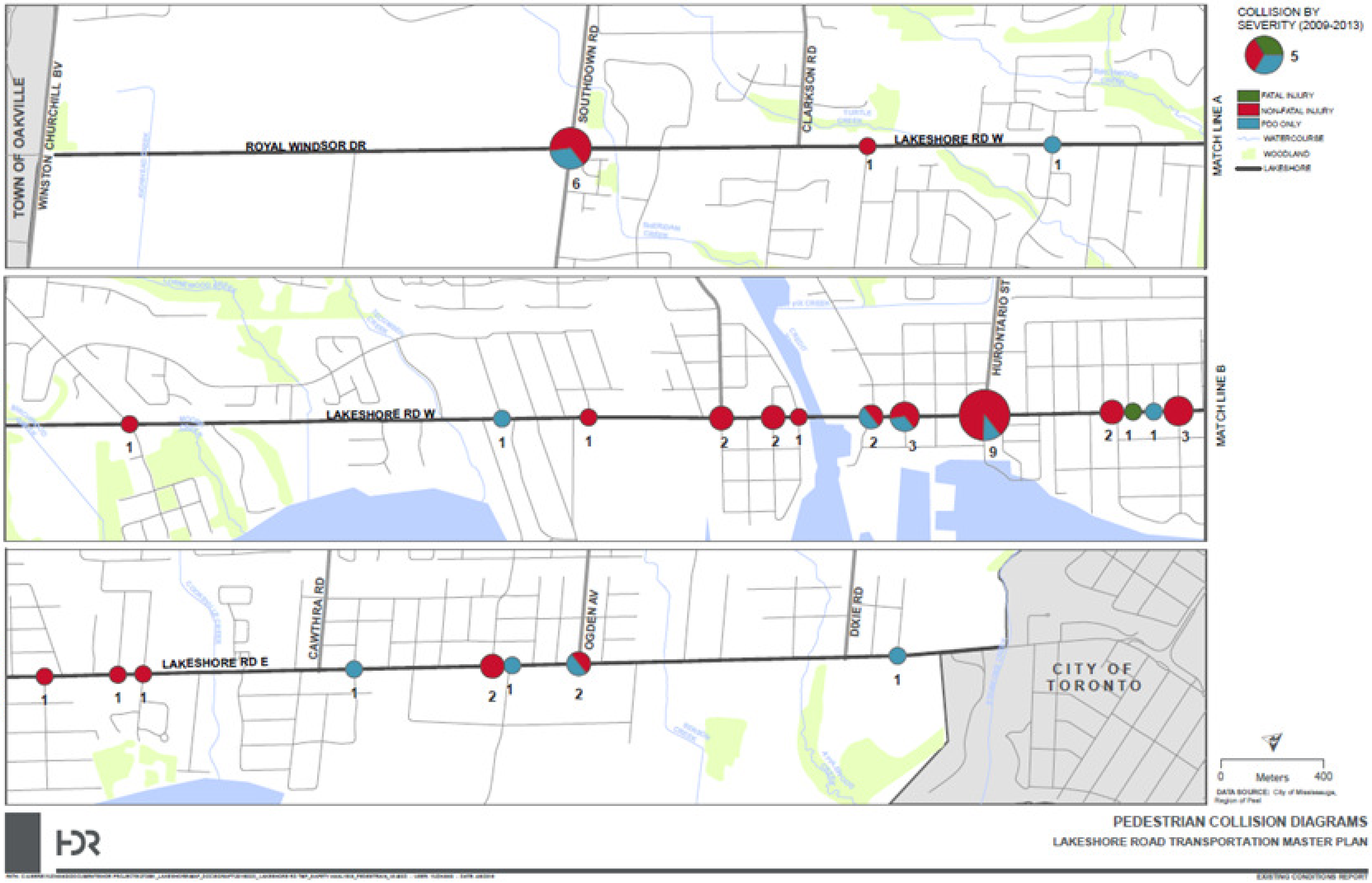

Figure 17: Location of Vulnerable User-Related Collisions by Severity

Fatal Collisions

Two fatal collisions occurred during the analysis period along the study corridor: at Alexandra Ave in 2011 and Briarwood Ave in 2010.The fatal collision occurred at Lakeshore Road and Alexandra Ave was taken place on a clear day, daylight condition, and dry environment, and the impact type was turning movement. The accident involved vehicle 1 reversing in eastbound direction and collided with vehicle 2. The potential casual factor was likely due to unexpected driving behavior.

The fatal collision at Briarwood Ave involved an eastbound vehicles colliding with a pedestrian (**Figure 18**) and it occurred on a clear day, dark-light condition (11:06 pm) and wet road surface. There is no north-south crosswalk at this T-intersection and there is likelihood that the pedestrian could be jay-walking across Lakeshore. As presented in **Figure 18,** on-street parked cars (south side of Lakeshore Road) can potentially obstruct the driver's view in dark conditions which could be a casual factor for the accident.

Figure 18: Fatal Collision at Lakeshore Road and Briarwood Avenue

Summary

The study corridor experienced 904 collisions reported between 2009 and 2013 in the study corridor. There were 743 (82.2%) PDO, 159 (17.6%) non-fatal injuries, and 2 (0.2%) fatal collisions. Majority of the collisions occurred in eastbound and westbound directions which are consistent with the traffic patterns on Lakeshore Road.

There are only 3 intersections within the study corridor that were included in the Region's network screening analysis; PSI and ranks for other intersections are not available. The intersection with the highest PSI ranking is Lakeshore Road at Winston Churchill Boulevard. The intersection with the highest collision rate is Southdown Road.

The location at which collisions occurred is relatively distributed along the study corridor, with the exception of Southdown Road which experienced the the highest number of collisions occurred within the review period:

- **Southdown Rd and Lakeshore Rd W**
  - 142 collisions: 118 PDO and 24 Non-fatal injury
  - Predominant impact type: rear-end

In addition, three other locations had a moderate number of collisions, including:

- **Stavebank Rd and Lakeshore Rd W (73 collisions)**
  - 73 collisions: 65 PDO and 8 Non-fatal injury
  - Predominant impact type: sideswipe
- **Mississauga Rd and Lakeshore Rd W (70 collisions)**
  - 70 collisions: 58 PDO and 12 Non-fatal injury
  - Predominant impact type: rear-end
- **Hurontario St / St Lawrence Dr and Lakeshore Rd E (68 collisions)**
  - 68 collisions: 56 PDO and 11 Non-fatal injury
  - Predominant impact type: rear-end

There are opportunities for reducing high rear-end collisions throughout the study corridors. The typical casual factor for this impact type is close traffic gaps during peak hour periods.

Hurontario St and Southdown Rd also had the highest number of vulnerable-users related collisions (9 and 6 collisions respectively). Consideration of active transportation facilities and road characteristics (e.g. bike lane, sidewalk, buffer width) at these two locations should be examined closely in future project phases

Lastly, there were two fatal collisions occurred on Lakeshore Road during analysis period, at Alexandra Ave in 2011 and Briarwood Ave in 2010. The incidence occurred at Briarwood Avenue involved an eastbound vehicle colliding with a pedestrian that resulted in a fatality. There was only one recorded vulnerable-user related collision at this location during the 5-year period and no other similar type of collisions can be observed.