Region of Peel

Transportation and Traffic Study Draft Report

Dixie Road Complete Corridor Study

October 2024

The findings of this report are based on the scope of work outlined in RFP 2023-304P and does not include evaluation of any other issues beyond that scope of work (unless otherwise stated). Arcadis has performed its services in a manner consistent with the usual standard of care and expertise exercised by members of the transportation profession. No other warranty, expressed or implied, is made. This report is for the exclusive use of the client.

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1 Introduction and Overview

Arcadis was retained to support the Regional Municipality of Peel to identify and recommend a design solution on Dixie Road between Lakeshore Road East and Rometown Drive. The intent of the study is to update the 2015 Dixie Road Bikeway Feasibility Study to transform Dixie Road into a complete street that supports all modes of transportation. The study scope includes developing, evaluating, and refining several alternatives to a conceptual design stage (10%) and advancing the preferred alternative to preliminary design (30%). This report summarizes recommendations for transportation and traffic to inform the development of design alternatives.

1.1 Study Objectives

This report has been prepared to:

- Outline policy and anticipated developments that impact the road network within the study area;
- Establish and summarize baseline and future traffic conditions operations to define and evaluate alternatives;
- Determine access impacts and requirements for proposed future developments;
- Conduct traffic signal and protected phase warrant reviews at all unsignalized intersections along the study area;
- Identify pedestrian-related infrastructure improvements to be considered during the development of design options;
- Determine an appropriate cycling facility class based on Ontario Traffic Manual (OTM) Book 18 (2021) and National Association of City Transportation Officials (NACTO) guidelines to inform options development; and
- Conduct a Multi-Modal Level of Service (MMLOS) assessment for the Dixie Road corridor within the study area.

1.2 Study Area

The study area limits for this project, shown in Exhibit 1, span approximately 1.6 km in length between Lakeshore Road East and Rometown Drive in the southeast end of the City of Mississauga.

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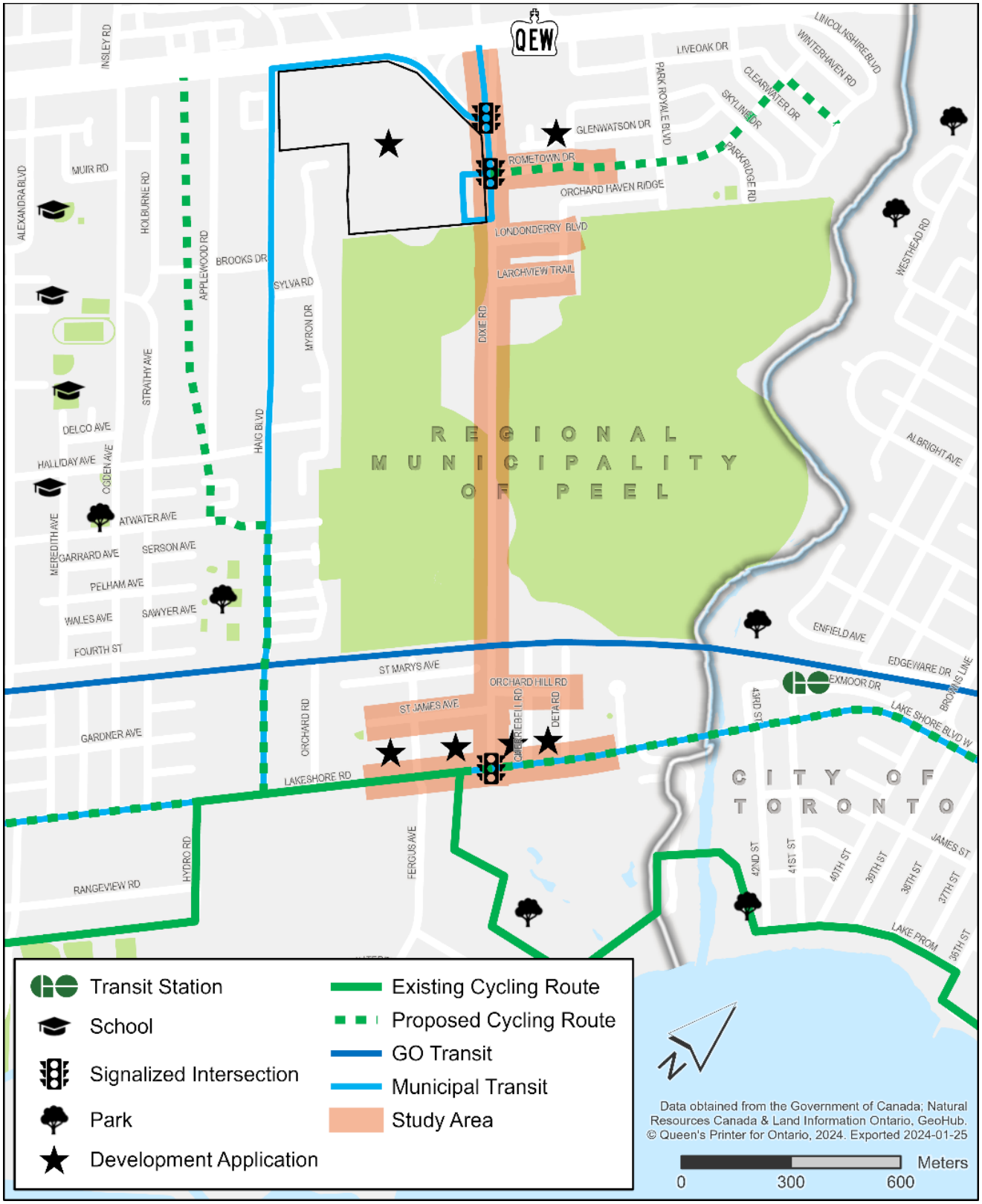
Exhibit 1: Study Area Map



2 Background & Project Context

The following section summarizes background context pertaining to the Dixie Road corridor, including regional and municipal policy, as well as anticipated developments along the study area. Additional details on future infrastructure projects impacting the study area, such as the QEW/Dixie Interchange reconfiguration and Lakeshore BRT, are covered in the standalone ***Study Area Profile*** memorandum.

2.1 Policy Review

A number of key policies and plans emphasize the importance of creating Complete Streets that support all modes of travel throughout Peel Region, the City of Mississauga and the Dixie Road corridor. Broad planning and policy support for Complete Streets is summarized below.

2.1.1 Provincial Policies

2.1.1.1 A Place to Grow: Growth Plan for Greater Golden Horseshoe (2020)

A Place to Grow (2020) is a provincial document that provides a framework for supporting future growth and development, in a way that supports Ontario's economy, environment, and community members. The Plan includes a number of transportation-specific policies that support the development of a balanced, multi-modal, sustainable, and safe transportation system for all users. The document specifically notes that a "complete streets approach will be adopted that ensures the needs and safety of all road users are considered and appropriately accommodated" (A Place to Grow, 2020 [3.2.2.3]).

2.1.2 Region of Peel

2.1.2.1 Official Plan (2022)

The Region of Peel Official Plan (2022) provides long-term planning guidance relating to growth and development in the Region of Peel. In addition to providing policy guidance on land use, growth management, and the environment, the Plan also outlines policies to guide the development of the Region's transportation network. The Official Plan outline the need to support a safe and sustainable transportation system that offers a variety of mobility options to users. Importantly, the Plan supports the Region's Long Term Transportation Plan objective of a 50% sustainable transportation mode share target and encourages a complete streets approach to roadway design that supports all users.

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2.1.2.2 Long Range Transportation Plan (2019)

The Region of Peel Long Range Transportation Plan (2019) provides a framework for guiding transportation planning needs in Peel to 2041. The Plan provides a foundation for transportation infrastructure planning and capital budgeting to ensure the Region's vision for its transportation system is achieved. Sustainability and safety are two major pillars of the plan. As previously noted, a key objective of the plan is to shift 50% of trips to sustainable modes by 2041, which is intended to be achieved through active transportation, Transportation Demand Management, and sustainability strategies. The plan also mentions the development of complete streets and complete communities as part of its proposed policy directions to better integrate land use and transportation and support all road users.

2.1.2.3 Sustainable Transportation Strategy (2018)

The Peel Region Sustainable Transportation Strategy (2018) guides the Region to achieve a 50% sustainable mode share target, accommodate growth within the transportation system, and create a regional transportation system that prioritizes safety, convenience, efficiency, sustainability, and supports all modes. The document includes key actions for developing a multi-modal transportation system including specific strategies for each mode including walking, cycling, transit, carpooling, and teleworking. The plan also outlines a proposed active transportation facility on Dixie Road between Rometown Drive to Queensway East, as illustrated in Exhibit 2.

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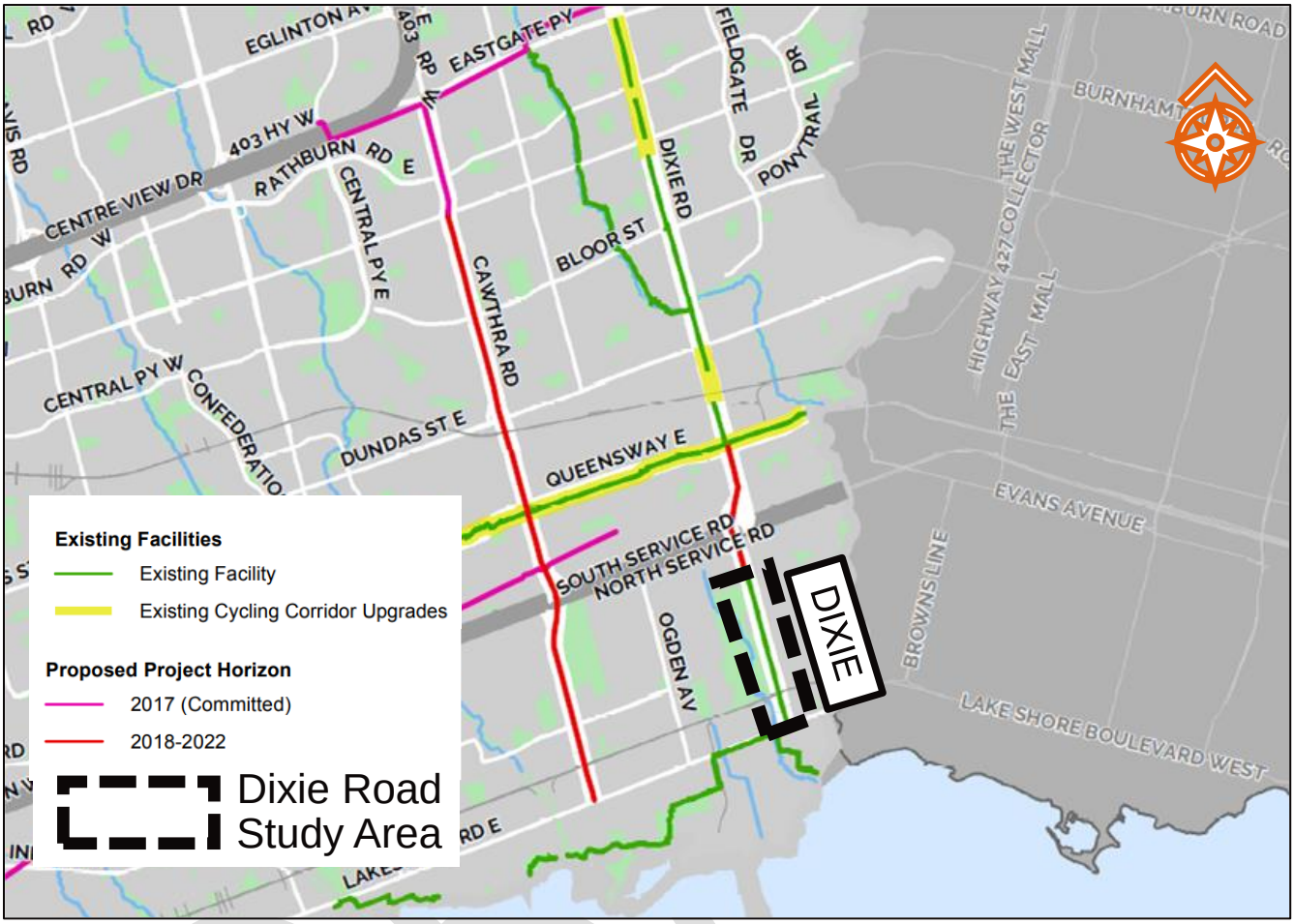
Exhibit 2: Region of Peel Sustainable Transportation Strategy (2018) Cycling Short Term Network & Upgrades Map



2.1.2.4 Dixie Road Bikeway Feasibility Study (2015)

The Dixie Road Bikeway Feasibility Study (2015) identified and recommended feasible strategies for the implementation of bikeways on the Dixie Road corridor between the QEW to Lakeshore Road East. The study involved the development of alternatives including design criteria and bikeway options based on the context of the 2015 Dixie Road cross-section. The study's final roadway reconfiguration proposal was to reconfigure the 4-lane cross-section of Dixie Road (at the time) into a 3-lane road with buffered bike lanes. This design was implemented in subsequent years and reflect the current configuration of the roadway under review today.

2.1.3 City of Mississauga

2.1.3.1 Official Plan (2023)

The City of Mississauga Official Plan (2023) provides guidance on how the City will grow and develop, including policies for land use, urban design, transportation, housing, and more. As part of

the Official Plan, the City outlines its objective of creating a multi-modal transportation city that supports all users. Policies in the plan look to prioritize transit and active transportation, improve connectivity, and separate different modes of transportation, when possible, to create a safer transportation system for all users.

2.1.3.2 Transportation Master Plan (2019)

The City of Mississauga Transportation Master Plan (2019) serves as a framework to assist the City's policy and business planning in a transportation lens, directing the City's investment in, and stewardship of, the transportation system. The Transportation Master Plan pursues six goals:

- Safety: Freedom from Harm;
- Inclusion: Freedom from Barriers;
- Integration: Freedom of Choice;
- Connectivity: Freedom of Access;
- Health: Freedom to Flourish; and
- Resilience: Freedom to evolve.

The Transportation Master Plan undertakes a strategic view of the City's transportation system from present to future, outlining appropriate actions to undertake in the short, medium and long term to achieve its outlined goals.

2.2 Development

The following section summarizes two largest future developments anticipated to occur along and nearby to the Dixie Road Corridor. Other major developments in the area are outlined in the standalone ***Study Area Profile*** memorandum. The traffic generated from all major developments and land use changes are incorporated in the traffic analysis for future horizon years in this study.

2.2.1 Dixie Outlet Mall

2.2.1.1 Slate Asset Management Development Application

In December 2022, Slate Asset Management submitted to the City of Mississauga a development application for the Dixie Outlet Mall site (1250 South Service Road). The proposal includes the development of 7.1 acres of land on the northwest boundaries of Dixie Outlet Mall (east of Haig Boulevard and south of South Service Road). Five residential apartments are planned to be built, adding approximately 1,250 residential units to the site. The proposed development will require demolition of the westernmost portion of the mall, removing 8,600 square metres of retail space.

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2.2.1.2 Dixie Outlet Mall Policy Review

In response to the development application, the City of Mississauga has initiated a land-use policy review to engage with the community on the future of the entire Dixie Outlet Mall site and to prepare an Official Plan Amendment (OPA). Draft policies have been prepared and presented at public consultation sessions held on January 29 and September 17, 2024. An information report on the proposed OPA was presented to the Planning and Development Committee on June 25, 2024. Implementation of the policies will be done through the Mississauga Official Plan Review in early 2025.

In general, the draft policy recommendations emphasize the principles of a compact, transit-supportive community, with a mix of housing, heights, and densities, as well as a transportation network that "facilitates transit, vehicles, cycling and pedestrian connections". Notable recommendations in the policy review are as follows:

- A minimum of 15,000 m2 of non-residential gross floor area required on the Dixie Outlet Mall site;
- Increases in building heights to allow a maximum of 15 storeys and 18 storeys in key locations on the site;
- The requirement to provide a concentration and mix of non-residential uses and jobs on the site;
- Possibility of applying traffic calming measures in the site area to improve road user safety;
- Enhancement of transit connections and service improvements, including an expansion of transit near Dixie Road and the southern site boundary;
- Pedestrian connections to existing and future streets, parks, and open spaces; and
- Complete streets for all users.

2.2.2 Lakeview Developments

In February 2019, a development application was made to the City for the former Ontario Power Generation lands located at Lakeshore Road East and Hydro Road. On 177 acres of land, this site, now known as "Lakeview Village" was planned to be redeveloped into a mixed use community for 8,050 residential units, cultural hub/pier, employment and park uses.

An expected construction start date has not been specified for the development. However, other master plans and studies are currently in progress. The most recent resubmission was the October 2023 Rangeview Development Master Plan for parks, retail, and 5,300 new residential units.

In May 2023, an Enhanced Minister's Zoning Order (EMZO) was issued to permit increased density for the Lakeview Village development. This results in increasing the originally approved

residential units from 8,050 to 16,000 units. The City of Mississauga is working with the Province to review the EMZO and its impacts to the surrounding area.

3 Traffic Operations Review

The following section describes the methodology used to develop the existing and future conditions Synchro models and provides a summary of traffic operations in existing and future conditions. While this section focuses on vehicular operations, please note that complementary MMLOS analysis is presented in this report in Section 6.

3.1 Methodology

Using prescribed turning movement count (TMC) data, signal timing plans, and other resources provided by the Region of Peel, the study area intersections were analyzed using the software package Synchro 11.0, which is based on the ***Highway Capacity Manual*** methodology. Parameters within the Synchro model were coded based on the **Region of Peel Traffic Impact Study Guidelines**. Per the Region of Peel's guidelines, the following criteria are used to identify "critical" movements:

- Volume/capacity (v/c) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.90 or above;
- v/c ratios for exclusive movements that exceed 1.00;
- Movements operating at LOS "E" or higher; and
- 95th percentile queue lengths for individual movements which exceed available lane storage.

The following section summarizes the methodology used to develop the existing and future conditions Synchro models.

3.1.1 Data Sources

The development of the Synchro models used turning movement counts (TMCs) and signal timing plans provided by the Region of Peel, with the exception of the TMC at the Dixie Outlet Mall south access, which was collected by Ontario Traffic Inc. (OTI). Additionally, EMME traffic growth projections provided by the City of Mississauga were used during the development of volume growth and trip generation assumptions.

3.1.1.1 Dixie Road TMCs

The TMC and signal timing plan dates are summarized in Exhibit 3. A compilation of signal timing plans and TMC data is presented in **Appendix A**.

Exhibit 3: Intersection Turning Movement Count and Signal Timing Plan Dates

Intersection	Control Type	TMC Date	Signal Timing Plan Date
Dixie Road & Lakeshore Road East	Signalized	2022-05-03	2023-12-21
Dixie Road & St James Avenue	Unsignalized	2021-10-07	-
Dixie Road & Orchard Hill Road	Unsignalized	2021-10-07	-
Dixie Road & Lakeview Golf Course Access	Unsignalized	N/A – generated through volume balancing	-
Dixie Road & Toronto Golf Club Access	Unsignalized	N/A – generated through volume balancing	-
Dixie Road & Fairways Condo (1400 Dixie Road) Access	Unsignalized	2023-05-10	-
Dixie Road & Larchview Trail	Unsignalized	2023-05-10	-
Dixie Road & Londonderry Boulevard	Unsignalized	2023-05-10	-
Dixie Road & Dixie Mall South Access	Signalized	2024-02-07	2024-01-16
Dixie Road & Rometown Drive	Signalized	2022-05-03	2023-12-21

It should be noted that some intersections were counted during periods of construction, which may affect the accuracy of the Existing Conditions model. This potential issue is addressed through balancing the volumes, as described in Section 3.2.1. Notable construction dates on Dixie Road which overlap with the collection date of select TMCs include:

- Spring 2021 through Fall 2021 – Construction on the east side of Dixie Road near the CN Rail Underpass from 7:00 AM to 7:00 PM Monday to Friday:
  - All vehicle lanes were generally maintained, with occasional short duration single lane reductions in the off-peak;
- May 2022 to July 2026 – QEW / Dixie Interchange Construction:
  - The west leg of Rometown Drive was closed around July 2023; and
  - Dixie Outlet Mall South Access was converted to a signalized intersection around summer 2023.

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3.1.1.2 City of Mississauga Travel Demand Model

The City of Mississauga's Travel Demand Model, in the form of EMME growth projection plots for the 2016 and 2041 horizon year, was used to estimate traffic growth along the Dixie Road corridor. The following assumptions were outlined by the City of Mississauga for the provided growth plots:

- All model runs utilize 2022 Council approved land use forecasts as a base;
- Dixie Road is modelled as a 2-lane cross-section in both 2016 and 2041 scenarios;
- 2041 forecasts have been adjusted for zones located in Mississauga, south of the Queen Elizabeth Way (QEW) as a result of policy changes occurring at the time of conducting the study (including the Lakeview Minister's Zoning Order (MZO));
- The 2041 plot assumes that the Dixie Outlet Mall site remains as existing, i.e. no new growth; and
- The 2041 network accounts for planned transportation network improvements, including improvements to the QEW/Dixie Road interchange.

Exhibit 4 and Exhibit 5 illustrate the link volumes determined by the City of Mississauga's Travel Demand Model in the AM and PM peak, along the 2016 and 2041 horizon years.

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Exhibit 4: City of Mississauga Travel Demand Model – AM Peak Hour Link Volumes

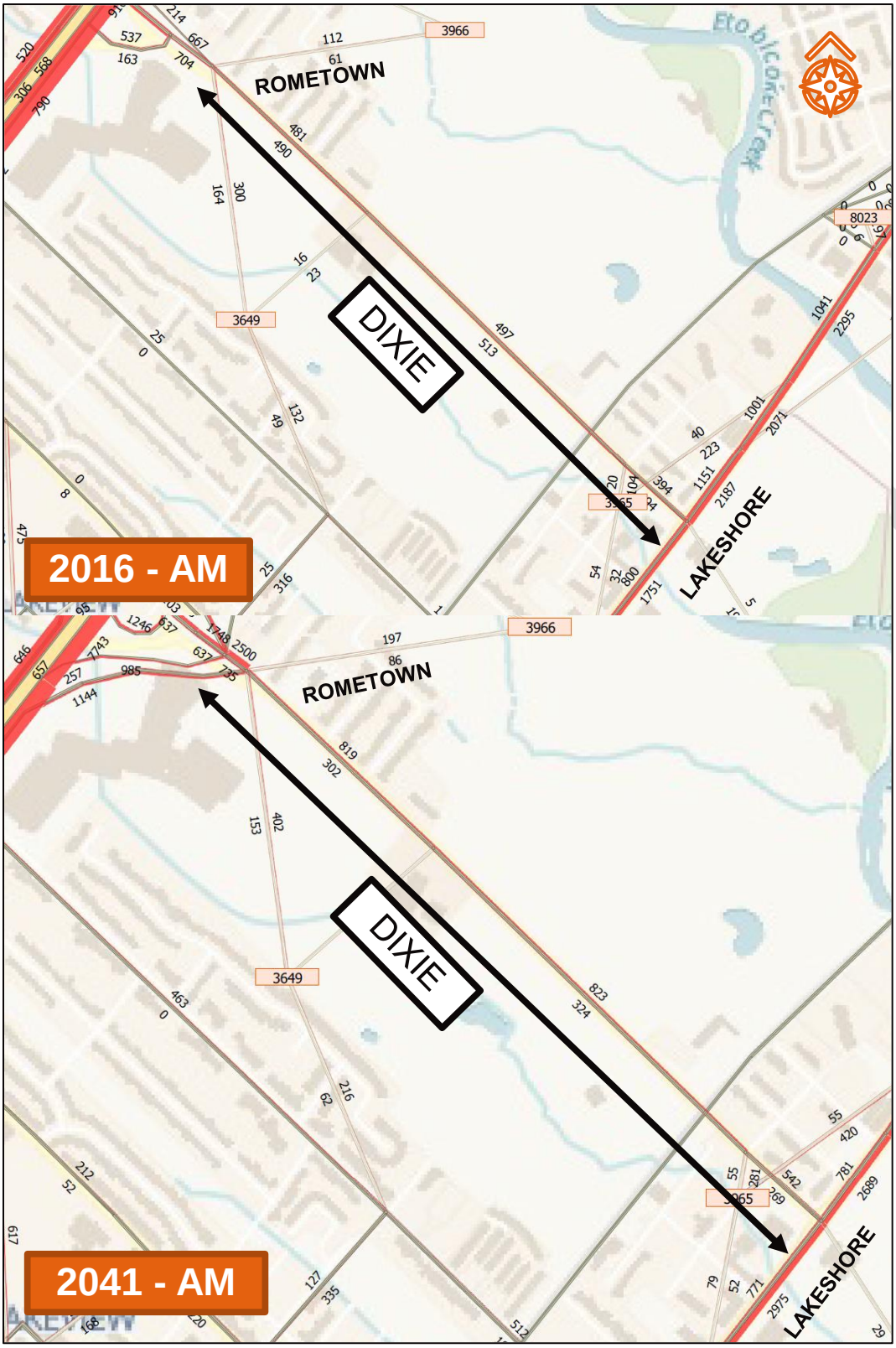
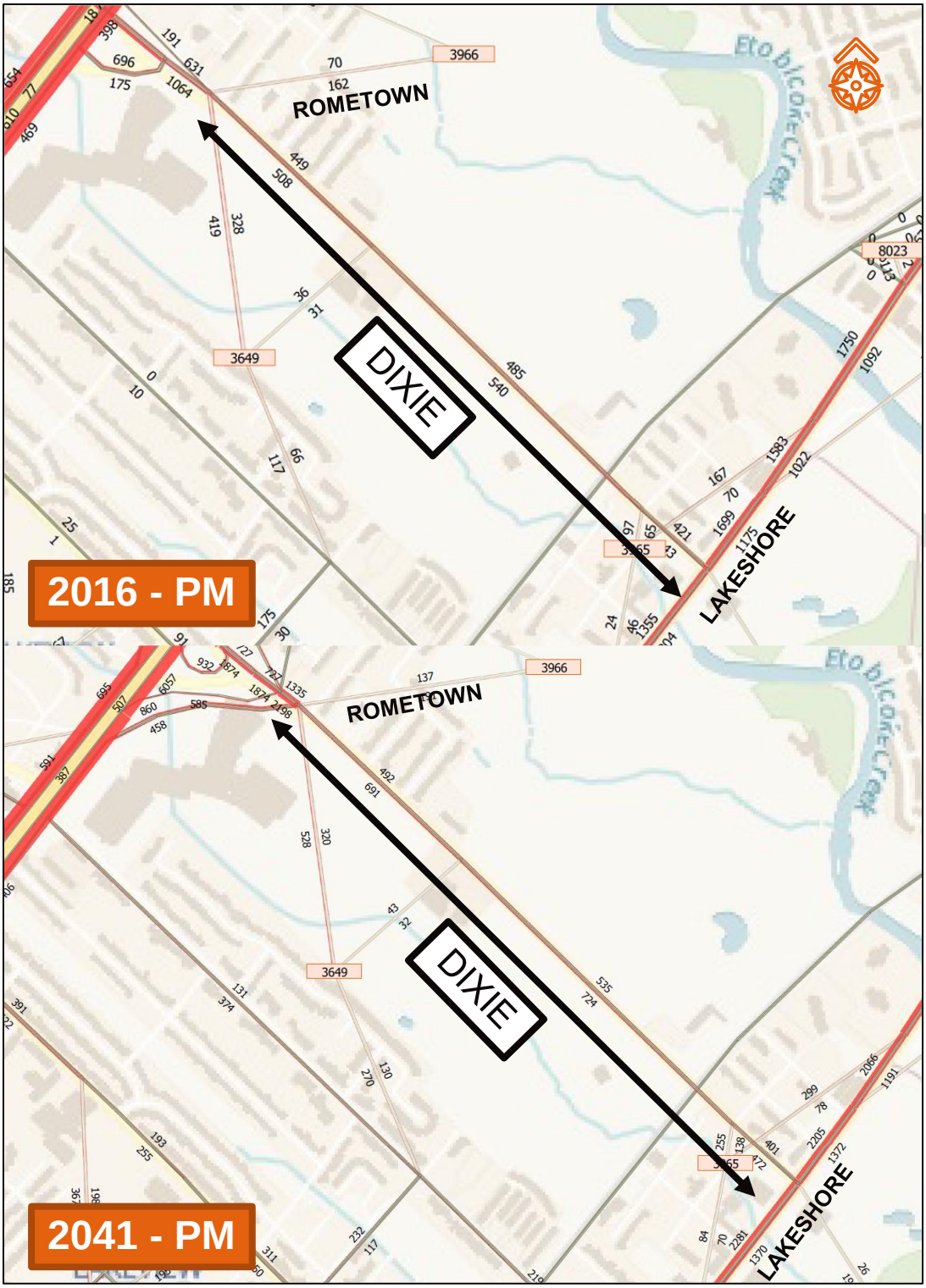


Exhibit 5: City of Mississauga Travel Demand Model – PM Peak Hour Link Volumes



3.1.2 Horizon Years and Analysis Periods

The Synchro models cover the following analysis scenarios over AM, Off, and PM peak periods:

- 2023 Existing Conditions; and
- 2041 Baseline Future Conditions.

3.1.3 Road Network Assumptions

The following assumptions to the road network are made:

- The 7 m lane width requirement outlined by the Region of Peel TIS Guidelines is interpreted as measured from the curb to centre (apex) of the road. As a result, lane widths on Dixie Road were coded based on received as-built drawings, with 3.5 m through lanes and 3.35 m auxiliary lanes for purposes of this analysis;
- In 2024 Existing Conditions, the lane configuration of Dixie Road at the Dixie Mall South Access and Rometown Drive was modelled based on pre-QEW Interchange Reconfiguration project conditions, as this geometry matches the conditions of the observed TMC data;
- Through volumes at both Lakeview Golf Course and Toronto Golf Club accesses were developed by balancing through volumes between Orchard Hill Road and the Fairways Condo (1400 Dixie Road) access. Meanwhile, side street turning movement counts were developed using the Institute of Transportation Engineers (ITE) Trip Generation Handbook, 11th Edition formula for a golf course (Land Use Code 430); and
- Through volumes at other intersections are balanced upwards based on the volumes observed at adjacent intersections.

Further traffic analysis assumptions are detailed in the standalone Transportation and Traffic Study Terms of Reference, dated March 18, 2024, and provided in **Appendix B**.

3.2 2023 Existing Conditions

The following section outlines traffic operations within the study area during existing conditions.

3.2.1 Volume Development & Balancing

For each peak period, northbound and southbound volumes along Dixie Road were fully balanced to reconcile the approaching and exiting vehicle volumes between intersections. The decision to balance through volumes using this methodology was based on the following:

- There are minimal sinks and sources (i.e., unsigned roads, private accesses / driveways, etc.) which vehicles could enter or exit from between each study area intersection; and

- Some of the received Turning Movement Counts (TMCs) were collected during the COVID-19 pandemic, which resulted in these specific intersections presenting significantly lower volumes than adjacent intersections with TMCs recorded post-COVID.

Exhibit 6 presents the balanced approach volumes within the AM, Off, and PM periods, respectively.

Exhibit 6: Volume Balancing Along Dixie Road

Intersection	Northbound Approach			Southbound Approach		
	Original	Revised	Difference	Original	Revised	Difference
Dixie Road & Lakeshore Road East	4 (2) [10]	4 (2) [10]	0 (0) [0]	314 (507) [374]	431 (512) [442]	117 (5) [68]
Dixie Road & St James Avenue	415 (413) [366]	568 (620) [500]	153 (207) [134]	317 (505) [388]	451 (541) [465]	134 (36) [77]
Dixie Road & Orchard Hill Road	423 (423) [373]	578 (636) [510]	155 (213) [137]	318 (508) [395]	451 (541) [465]	133 (33) [70]
Dixie Road & Lakeview Golf Course Access	-	579 (637) [510]	579 (637) [510]	-	460 (543) [464]	460 (543) [464]
Dixie Road & Toronto Golf Club Access	-	568 (635) [511]	568 (635) [511]	-	468 (545) [463]	468 (545) [463]
Dixie Road & Fairways Condo (1400 Dixie Road) Access	558 (633) [424]	560 (633) [511]	2 (0) [87]	474 (561) [470]	474 (570) [479]	0 (9) [9]
Dixie Road & Larchview Trail	585 (634) [437]	585 (635) [529]	0 (1) [92]	456 (564) [473]	457 (574) [475]	1 (10) [2]
Dixie Road & Londonderry Boulevard	577 (620) [418]	584 (629) [520]	7 (9) [102]	448 (566) [471]	452 (577) [478]	4 (11) [7]
Dixie Road & Dixie Outlet Mall South Access	534 (496) [509]	577 (626) [514]	43 (130) [5]	450 (670) [573]	493 (670) [573]	43 (0) [0]
Dixie Road & Rometown Drive	418 (447) [384]	559 (617) [539]	141 (170) [155]	472 (780) [664]	472 (780) [664]	0 (0) [0]

AM (PM) [OFF] = Peak Period Volume

3.2.1.1 Golf Course Volume Development

While through volumes along Dixie Road at the Lakeview Golf Course and Toronto Golf Club accesses were developed via volume balancing, inbound and outbound volumes to these locations were developed utilizing the *ITE Trip Generation Handbook, 11th Edition.* Specifically, ITE Land Use code 430 was used to estimate trips to-and-from the golf facilities.

Exhibit 7 summarizes the number of vehicle trips generated by both golf course sites.

Exhibit 7: Trip Generation Summary for Golf Course Sites

LUC	Parameters	AM Peak Hour			PM Peak Hour			Off-Peak Hour		
		Total	Entry	Exit	Total	Entry	Exit	Total	Entry	Exit
430 – Golf Course **Lakeview Golf Course – 18 holes**	Fitted Curve Equation	Ln(T) = 0.91 Ln(X) + 0.77			N/A Average Rate = 2.91			T = (34.93(X) - 102.33) / 24 (Weekday converted to average hourly rate)		
	Distribution	100%	79%	21%	100%	53%	47%	100%	50%	50%
	Vehicle Trips – Lakeview Golf Course	**30**	**24**	**6**	**52**	**28**	**24**	**22**	**11**	**11**
430 – Golf Course **Toronto Golf Club – 18 holes**	Fitted Curve Equation	Ln(T) = 0.91 Ln(X) + 0.77			N/A Average Rate = 2.91			T = (34.93(X) - 102.33) / 24 (Weekday converted to average hourly rate)		
	Distribution	100%	79%	100%	79%	100%	79%	100%	50%	50%
	Vehicle Trips – Toronto Golf Club	**30**	**24**	**6**	**52**	**28**	**24**	**22**	**11**	**11**

The AM and PM peak period volumes were developed using the peak hour equations. The off-peak period volumes, meanwhile, were estimated by deriving an average hourly rate by dividing the weekday trip generation rate by 24 hours.

Exhibit 8 illustrates the distribution of golf course site trips among the two accesses and Dixie Road.

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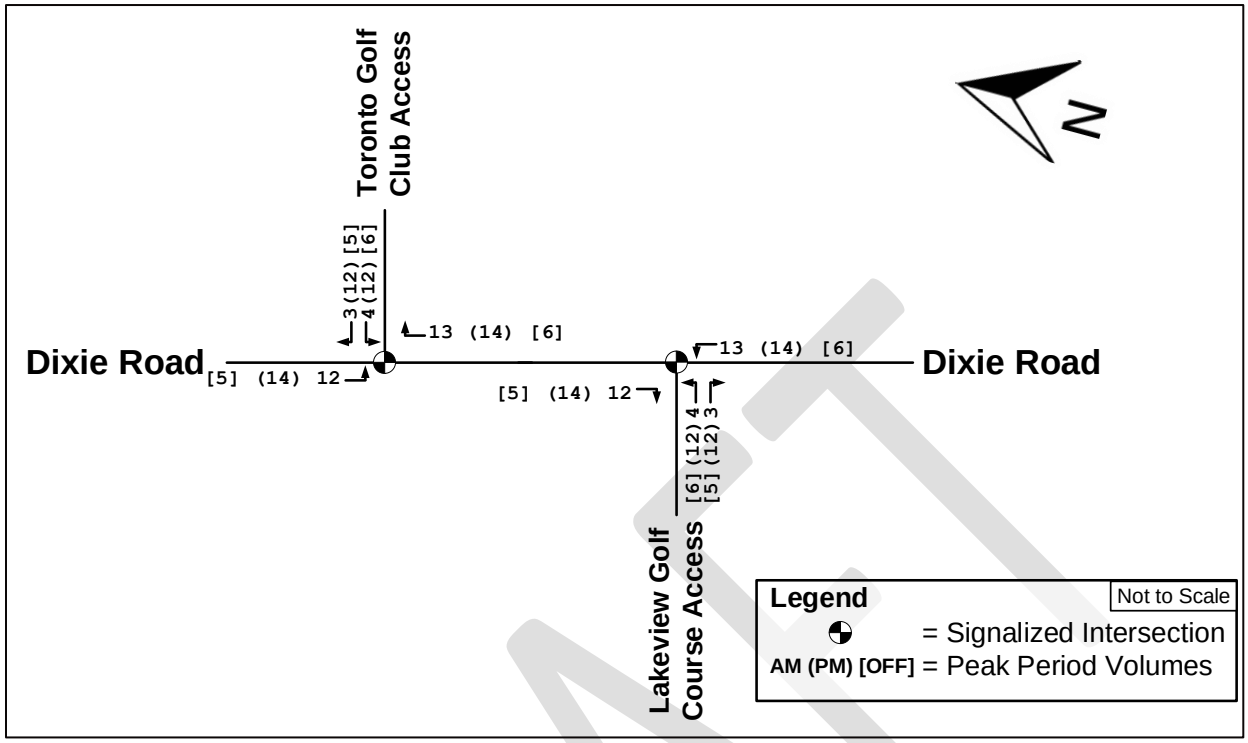
Exhibit 8: Trip Distribution of Golf Course Site Trips at Accesses



3.2.1.2 2023 Existing Conditions Lane Configuration and Volumes

Exhibit 9 and Exhibit 10 illustrate the lane configuration and volumes used for the 2023 Existing Conditions scenario, respectively.

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Exhibit 9: 2023 Existing Conditions Lane Configurations

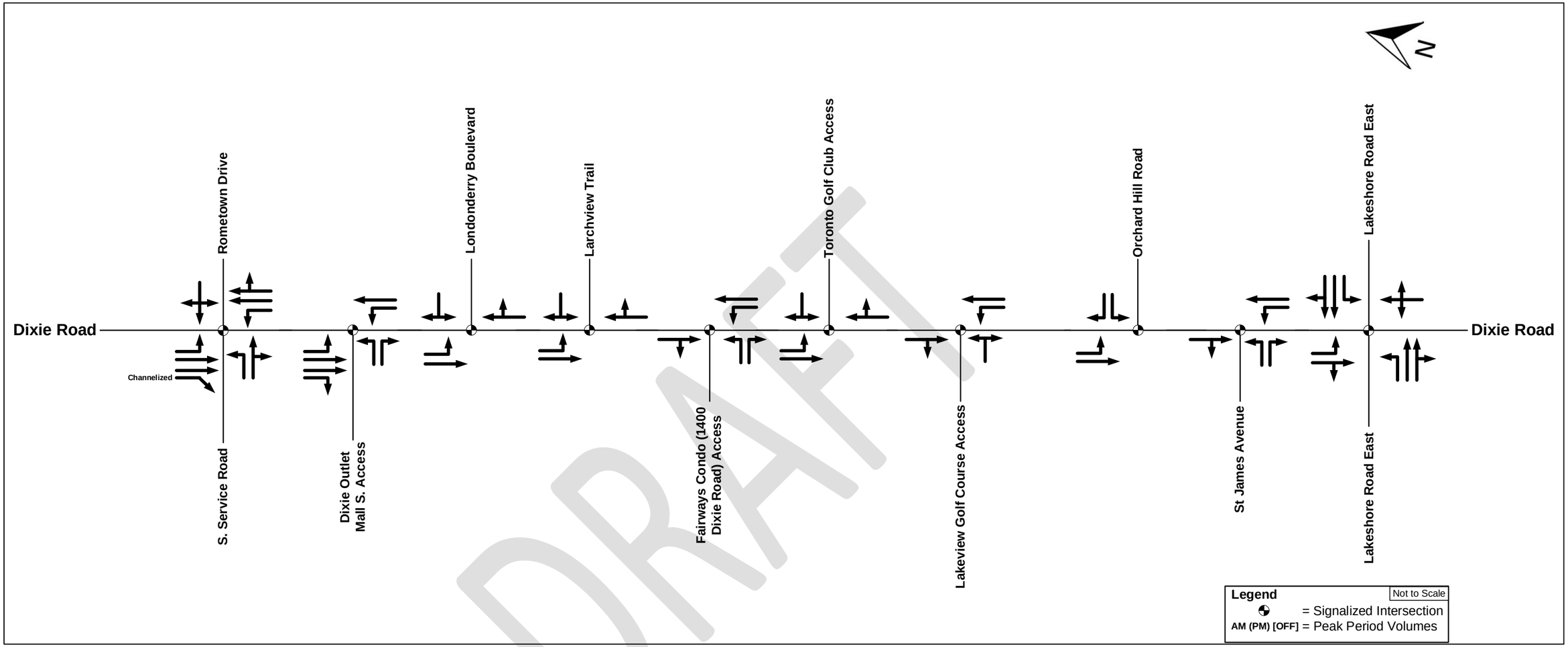

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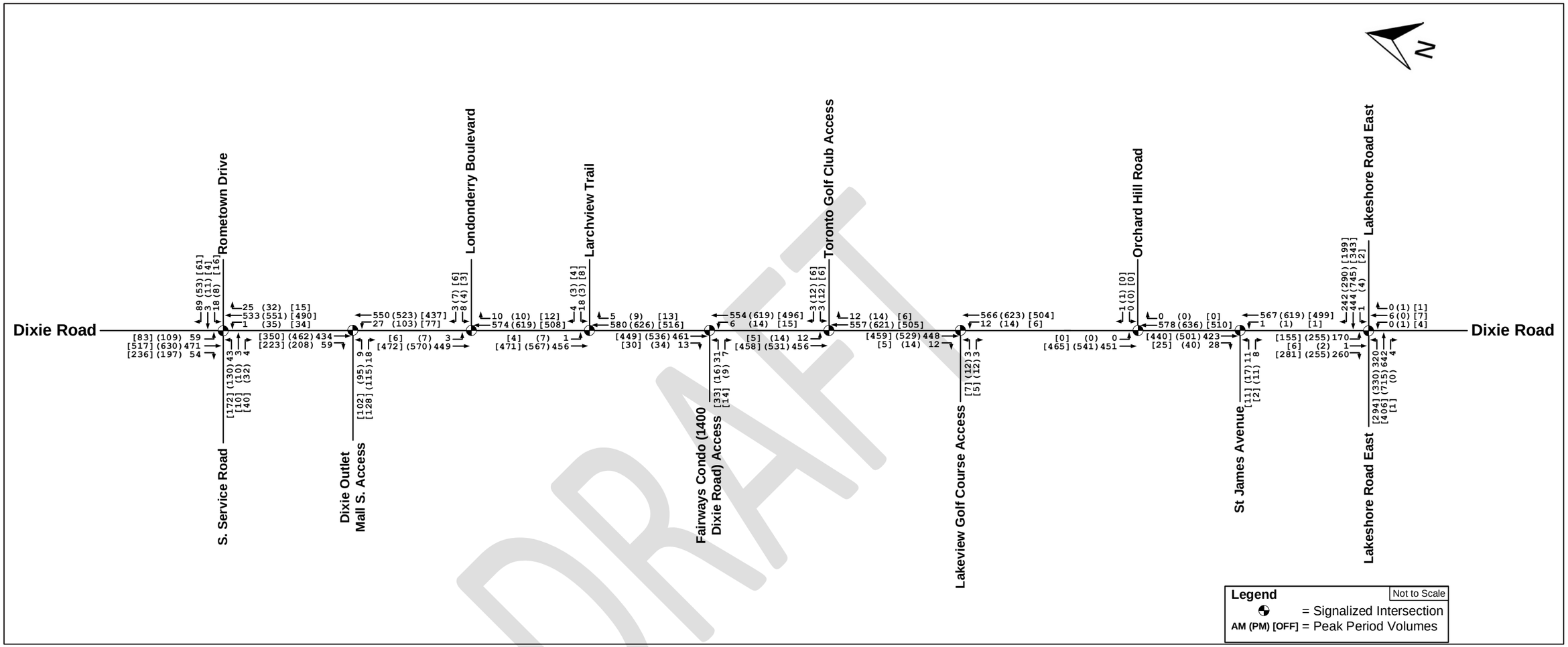
Exhibit 10: 2023 Existing Conditions Network Volumes



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3.2.2 2023 Existing Conditions Operational Summary

Exhibit 11 presents traffic operations at signalized intersections, while Exhibit 12 summarizes operations at unsignalized intersections in the existing conditions scenario. Full Synchro results outputs for all signalized and unsignalized intersections in existing conditions are provided in **Appendix C**.

Exhibit 11: 2023 Existing Conditions – Signalized Intersection Movements Operational Summary

Intersection	Peak Period	Intersection LOS	Intersection Delay	Intersection V/C Ratio	Critical Movement					
					Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)
Dixie Road and Lakeshore Road East	AM	B	18.2	0.67	EBL	A	9.5	0.63	45	42
					EBTR	A	6.5	0.27	46	-
					WBL	B	10.7	0.00	1	27.7
					WBTR	B	14.1	0.37	70	-
					NBLTR	D	40.9	0.02	4	-
					SBL	E	57.1	0.73	58	91.7
					SBTR	D	42.5	0.19	21	-
	Off	B	16.9	0.56	EBL	A	7.2	0.51	42	42
					EBTR	A	6.0	0.19	29	-
					WBL	B	10.6	0.00	2	27.7
					WBTR	B	13.1	0.30	49	-
					NBLTR	C	33.5	0.04	6	-
					SBL	D	42.9	0.64	42	91.7
					SBTR	D	35.1	0.22	19	-
	PM	C	27.2	0.91	EBL	D	43.5	0.90	93	42
					EBTR	A	9.0	0.32	53	-
					WBL	B	14.5	0.01	3	27.7
					WBTR	C	22.9	0.63	122	-
					NBLTR	D	36.1	0.00	-	-
					SBL	E	64.2	0.85	90	91.7
					SBTR	D	37.9	0.18	21	-
Dixie Road and Dixie Outlet Mall South Access	AM	A	3.1	0.35	EBLT	E	55.1	0.11	7	-
					EBR	D	54.2	0.01	5	20
					NBL	A	1.8	0.04	3	20
					NBTR	A	3.1	0.37	43	-
					SBLT	A	0.5	0.15	2	-
					SBR	A	0.1	0.05	0	-
	Off	B	10.4	0.35	EBLT	D	48.6	0.53	38	-
					EBR	D	43.8	0.09	17	20

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Intersection	Peak Period	Intersection LOS	Intersection Delay	Intersection V/C Ratio	Critical Movement					
					Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)
					NBL	A	3.8	0.11	9	20
					NBTR	A	4.9	0.33	46	-
					SBLT	A	1.5	0.14	5	-
					SBR	A	1.1	0.15	0	-
	PM	B	10.2	0.40	EBLT	D	54.1	0.45	35	-
					EBR	D	50.3	0.08	15	20
					NBL	A	4.5	0.16	20	20
					NBTR	A	5.8	0.39	95	-
					SBLT	A	1.4	0.18	6	-
					SBR	A	1.1	0.15	-	-
Dixie Road and Rometown Drive	AM	A	9.3	0.26	EBL	D	51.5	0.44	18	-
					EBTR	D	46.1	0.04	5	-
					WBLTR	D	47.5	0.19	18	-
					NBL	A	3.2	0.00	0	52.8
					NBTR	A	3.5	0.23	37	-
					SBL	A	4.3	0.12	13	31.4
					SBT	A	4.3	0.20	36	-
					SBR	A	3.6	0.04	5	-
	Off	B	13.1	0.34	EBL	D	46.5	0.67	51	-
					EBTR	D	36.3	0.16	17	-
					WBLTR	D	35.8	0.11	14	-
					NBL	A	5.4	0.06	6	52.8
					NBTR	A	6.1	0.23	26	-
					SBL	A	7.2	0.16	17	31.4
					SBT	A	7.3	0.24	39	-
					SBR	A	7.0	0.16	10	-
	PM	B	11.8	0.33	EBL	E	58.3	0.65	48	-
					EBTR	D	47.1	0.16	18	-
					WBLTR	D	46.6	0.11	16	-
					NBL	A	4.2	0.07	6	52.8
					NBTR	A	4.7	0.23	28	-
					SBL	A	6.2	0.19	21	31.4
					SBT	A	6.0	0.26	47	-
					SBR	A	5.4	0.13	9	-

Per Exhibit 11, the majority of signalized movements in existing conditions operate under Region of Peel critical thresholds, except for the following movements:

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- Dixie Road and Lakeshore Road East;
  - Southbound left turn in the AM and PM peak;
  - Eastbound left turn in the PM peak;
- Dixie Road and Dixie Outlet Mall South Access – shared eastbound left-through in the AM peak; and
- Dixie Road and Rometown Drive – Eastbound left turn in the PM peak.

Considering that the majority of these movements operate at LOS E, while v/c ratios and 95th percentile queues are under critical thresholds, critical operations on these movements are likely attributed to excessive signal delay caused by high cycle lengths, as well as minimal green time allocated to these movements in favour of other higher-demand movements.

Note that all northbound and southbound through movements along Dixie Road operate well below critical thresholds.

Per Exhibit 12, all unsignalized intersections along Dixie Road within the study area are expected to operate below critical thresholds.

Exhibit 12: Existing Conditions – Unsignalized Intersection Movements Operational Summary

Intersection	Peak Period	Intersection Delay (s)	Lane	Lane LOS	Lane Delay (s)	Lane V/C Ratio	Lane 95th Percentile Queue (m)	Lane Storage Capacity (m)
Dixie Road and St James Avenue	AM	0.2	EBL-R	B	12.7	0.03	1	-
			NBL-T	A	8.4	0.38	0	-
			SBTR	A	0.0	0.30	0	-
	Off	0.2	EBL-R	B	13.5	0.03	1	-
			NBL-T	A	8.4	0.32	0	-
			SBTR	A	0.0	0.30	0	-
	PM	0.3	EBL-R	B	13.3	0.04	1	-
			NBL-T	B	10.5	0.38	0	-
			SBTR	A	0.0	0.33	0	-
Dixie Road and Orchard Hill Road	AM	0.0	WBL-R	C	20.6	0.00	0	-
			NBTR	A	0.0	0.39	0	-
			SBL-T	A	0.0	0.30	0	-
	Off	0.0	WBL-R	A	0.0	0.00	0	-
			NBTR	A	0.0	0.33	0	-
			SBL-T	A	0.0	0.30	0	-
	PM	0.0	WBL-R	C	20.6	0.00	0	-
			NBTR	A	0.0	0.39	0	-
			SBL-T	A	0.0	0.33	0	-
	AM	0.2	EBLR	B	12.4	0.03	0	-

Intersection	Peak Period	Intersection Delay (s)	Lane	Lane LOS	Lane Delay (s)	Lane V/C Ratio	Lane 95th Percentile Queue (m)	Lane Storage Capacity (m)
Dixie Road and Lakeview Golf Course Access			NBL-T	A	8.4	0.36	0	-
			SBTR	A	0.0	0.29	0	-
	Off	0.2	EBLR	B	12.4	0.03	1	-
			NBL-T	A	8.4	0.32	0	-
			SBTR	A	0.0	0.30	0	-
	PM	0.4	EBLR	B	13.5	0.06	1	-
			NBL-T	A	8.7	0.40	0	-
			SBTR	A	0.0	0.35	0	-
Dixie Road and Toronto Golf Club Access	AM	0.2	WBLR	B	12.9	0.01	0	-
			SBL-T	A	8.8	0.29	0	-
			NBTR	A	0.0	0.36	0	-
	Off	0.2	WBLR	B	12.4	0.03	1	-
			SBL-T	A	8.5	0.29	0	-
			NBTR	A	0.0	0.33	0	-
	PM	0.4	WBLR	B	14.1	0.06	2	-
			SBL-T	A	9.0	0.34	0	-
			NBTR	A	0.0	0.41	0	-
Dixie Road and Fairways Condo (1400 Dixie Road) Access	AM	0.5	EBL-R	B	13.6	0.08	2	-
			NBL-T	A	8.5	0.37	0	-
			SBTR	A	0.0	0.31	0	-
	Off	0.7	EBL-R	B	12.7	0.07	2	-
			NBL-T	A	8.4	0.30	0	-
			SBTR	A	0.0	0.29	0	-
	PM	0.4	EBL-R	B	13.4	0.04	1	-
			NBL-T	A	8.7	0.38	0	-
			SBTR	A	0.0	0.35	0	-
Dixie Road and Larchview Trail	AM	0.3	WBLR	B	13.8	0.06	1	-
			SBL-T	A	8.9	0.30	0	-
			NBTR	A	0.0	0.39	0	-
	Off	0.2	WBLR	B	12.6	0.02	1	-
			SBL-T	A	8.6	0.29	0	-
			NBTR	A	0.0	0.32	0	-
	PM	0.1	WBLR	B	13.4	0.01	0	-
			SBL-T	A	8.9	0.34	0	-
			NBTR	A	0.0	0.38	0	-
Dixie Road and Londonderry Boulevard	AM	0.2	WBLR	C	18.4	0.04	1	-
			SBL-T	A	9.9	0.15	0	-
			NBTR	A	0.0	0.38	0	-

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Intersection	Peak Period	Intersection Delay (s)	Lane	Lane LOS	Lane Delay (s)	Lane V/C Ratio	Lane 95th Percentile Queue (m)	Lane Storage Capacity (m)
	Off	0.2	WBLR	B	13.5	0.02	1	-
			SBL-T	A	8.5	0.14	0	-
			NBTR	A	0.0	0.32	0	-
	PM	0.2	WBLR	C	17.0	0.04	1	-
			SBL-T	A	9.3	0.18	0	-
			NBTR	A	0.0	0.39	0	-

3.3 2041 Future Conditions

The following section outlines traffic operations within the study area during the 2041 horizon year.

3.3.1 Traffic Growth Projections

EMME growth plots provided by the City of Mississauga for the 2016 and 2041 horizon years were used to develop growth rates for the following movements:

- Northbound and southbound through movements on Dixie Road across all intersections, and southbound left and right movements at Dixie Road and Lakeshore Road East;
- All eastbound and westbound movements on Lakeshore Road East, at the intersection of Dixie Road and Lakeshore Road East; and
- Eastbound movements on the future South Service Road, at the intersection of Dixie Road and South Service Road / Rometown Drive due to the anticipated extension of South Service Road into Dixie Road.

Based on the City of Mississauga's EMME growth projection plots, the following Compound Annual Growth Rate (CAGR) is expected:

- **Dixie Road between Lakeshore Road East and Rometown Drive:**
  - 0.3% / year in the AM and off-peak[1];
  - 1.4% / year in the PM Peak;
- **Lakeshore Road East at the intersection of Lakeshore Road East and Dixie Road:**
  - 1.0% / year in the AM and off-peak;
  - 1.4% / year in the PM Peak; and

[1] At multiple intersections, the distribution and magnitude of volumes among individual movements in the off-peak matched the AM peak more similarly than the PM peak. As such, it was assumed that background growth in the off-peak would mostly follow the growth trends observed in the AM peak.

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- **South Service Road at the intersection of Dixie Road and South Service Road / Rometown Drive:**
  - 6.8% in the AM and off-peak;
  - 3.5% in the PM Peak.

Exhibit 13 illustrates the grown volumes used for analysis for the 2041 horizon year.

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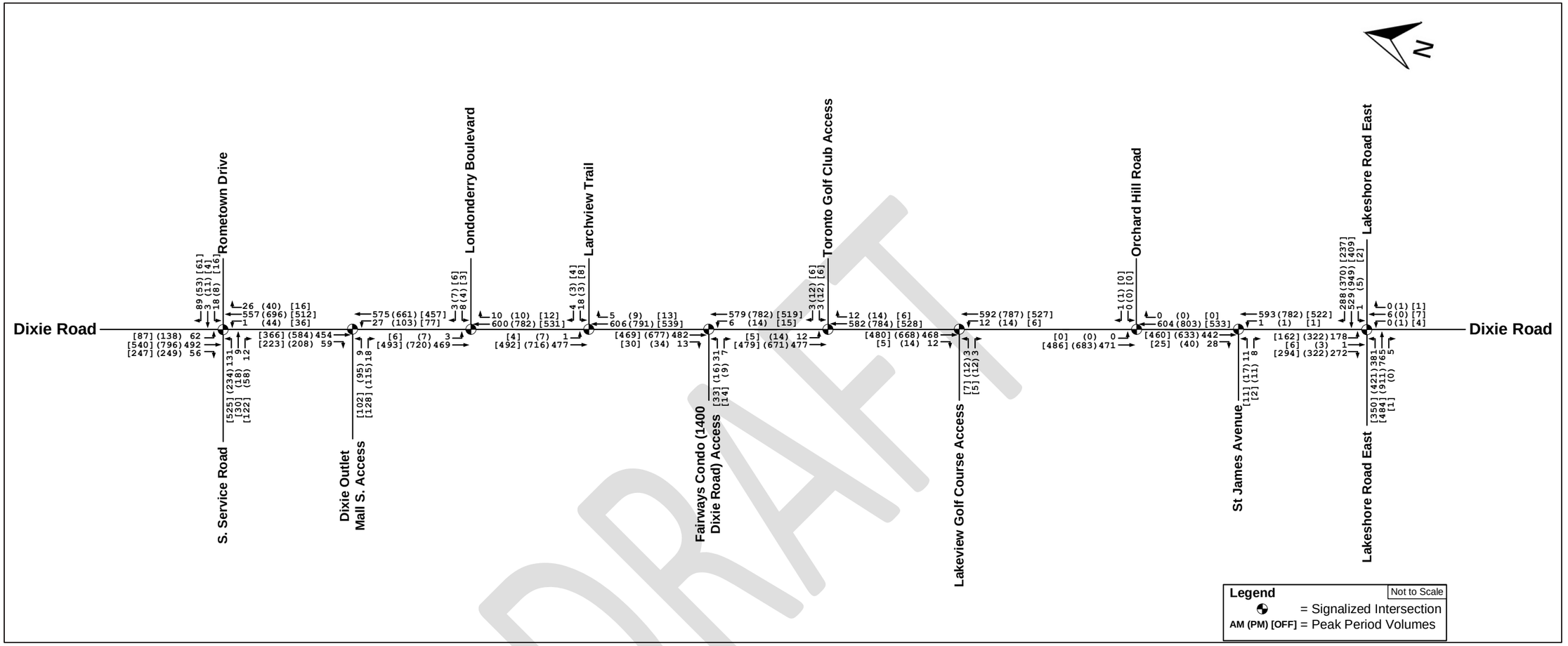
Exhibit 13: 2041 Horizon Year Baseline Grown Volumes



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3.3.2 Future Volume Generation of Dixie Outlet Mall Site

Although the EMME growth plots provided by the City of Mississauga were stated to account for most developments and transit improvements along and adjacent to Dixie Road, they also assumed that the Dixie Outlet Mall site remained "as existing, i.e., no new growth". As such, to account for the growth at the Dixie Outlet Mall site, traffic volumes were generated separately, as described in the following section.

3.3.2.1 City of Mississauga Land-use Policy Review

The existing Dixie Outlet Mall site is currently undergoing a land-use policy review by the City of Mississauga to engage with the community on the future of the entire Dixie Outlet Mall site and to prepare an Official Plan Amendment (OPA). Draft policies have been prepared and presented at public consultation sessions held on January 29 and September 17, 2024. An information report on the proposed OPA was presented to the Planning and Development Committee on June 25, 2024. Implementation of the policies will be done through the Mississauga Official Plan Review in early 2025.

As part of the review, the City of Mississauga has developed a set of scenarios pertaining to service capacity at the site, with the following characteristics outlined in Exhibit 14:

Exhibit 14: Dixie Outlet Mall Land-Use Policy Review Capacity Scenarios

Scenario	Number of Residential Dwellings	Commercial Gross Floor Area (GFA) [m^2]
Low	1,508	12,000
Mid	**3,944** (164 townhouse units, 3,780 apartment units)	**15,000** (6,400 commercial, 7,500 office, 1,100 other)
Mid-High	4,679	15,000
High	8,039	15,000

Aa = Scenario assumed for analysis

For purposes of analysis, the "Mid" scenario was assumed for purposes of generating volumes at the Dixie Outlet Mall site.

Development volumes for the City's policy review were estimated using the *ITE Trip Generation Handbook, 11th Edition*, while the trips generated by Slate Asset Management's proposed site at 1250 South Service Road were taken from the Transportation Impact Study of the development by LEA, completed in December 2022.

The trip generation methodology for the land-use policy portion of the Dixie Outlet Mall site is as follows:

1. Vehicle trips are generated for each separate land-use portion of the development site using ITE Land Use Codes (LUCs);
2. Vehicle trips are converted to person trips. Based on Section 5.5.2 of the ***ITE Trip Generation Handbook 3rd Edition (2017)***, it is generally assumed that the auto mode split of person trips made by vehicle is typically 95 percent of the total mode share. The vehicle trips generated were divided by 95 percent to convert them to people trips;
3. The resulting person trips are distributed by the Region of Peel's sustainable mode share target of 50%, following the assumption that, by the 2041 horizon year, the sustainable mode share target is met. It is important to reflect the Region's vision in the planning and design of future infrastructure to ensure alignment in decision-making;
4. An occupancy rate based on 2016 Transportation Tomorrow Survey (TTS) data is generated for the study area by calculating the ratio between the trips made by people in vehicles in general, by the trips made by drivers, per the following formula:

$$Vehicle\ Occupancy\ Rate = \frac{Driver\ Trips + Passenger\ Trips}{Driver\ Trips}$$; then

5. The person trips are divided by the generated TTS occupancy rate to convert back to vehicle trips.

Exhibit 15 summarizes key parameters and trips generated for the Dixie Outlet Mall site.

Exhibit 15: Trip Generation Summary for Dixie Outlet Mall Land-Use Policy Review

LUC	Parameters	AM Peak Hour			PM Peak Hour		
		Total	Entry	Exit	Total	Entry	Exit
220 - Multifamily Housing (Low-Rise) - Not Close to Rail Transit **164 dwellings**	Fitted Curve Equation	T = 0.31(X) + 22.85			T = 0.43(X) + 20.55		
	Distribution	100%	24%	76%	100%	63%	37%
	Vehicle Trips	74	18	56	91	57	34
222 - Multifamily Housing (High-Rise) - Not Close to Rail Transit **3,780 dwellings**	Fitted Curve Equation	T = 0.22(X) + 18.85			T = 0.26(X) + 23.12		
	Distribution	100%	24%	74%	100%	62%	38%
	Vehicle Trips	850	221	629	1006	624	382
821 - Shopping Plaza (40-150k) - Supermarket – Yes **69,000 sq ft GLA**	Fitted Curve Equation	N/A Average Rate = 3.53			T = 7.67(X) + 118.86		
	Distribution	100%	62%	38%	100%	48%	52%
	Vehicle Trips	244	151	93	648	311	337
	Fitted Curve Equation	Ln(T) = 0.86 Ln(X) + 1.16			Ln(T) = 0.83 Ln(X) + 1.29		

LUC	Parameters	AM Peak Hour			PM Peak Hour		
		Total	Entry	Exit	Total	Entry	Exit
710 - General Office Building **81,000 sq ft GFA**	Distribution	100%	88%	12%	100%	17%	83%
	Vehicle Trips	140	123	17	139	24	115
Subtotal – ITE Vehicle Trips		1308	513	795	1884	1016	868
Conversion to People Trips		0.95					
Subtotal – ITE People Trips		1377	540	837	1983	1069	914
Region of Peel Sustainable Mode Share Target		50%					
TTS Occupancy Rate		1.30					
2041 Horizon Year Vehicle Site Trips		**530**	**208**	**322**	**764**	**412**	**352**

3.3.2.2 Slate Asset Management (1250 South Service Road) Development

In addition to the land-use policy review being conducted by the City of Mississauga, Slate Asset Management has proposed a residential development on the northwest corner of the site at 1250 South Service Road. Per the 2022 LEA Consulting study of this proposed development, the site is estimated to generate a total of 207 trips (54 inbound, 153 outbound) during the AM peak and remove 27 trips (1 inbound, 26 outbound) during the PM peak.

It was noted by the City of Mississauga that trips from this development are included in the development scenarios shown in Exhibit 14. Additionally, for the purpose of this analysis, no trips are removed from the network.

3.3.2.3 Off-Peak Volumes

As ITE's Trip Generation manual does not include off-peak volumes and the off-peak period was not analyzed for the 1250 South Service Road development, off-peak site volumes were generated through the following methodology:

1. The mall site TMCs at the South Mall Access and Rometown Drive were used to calculate the percent difference between the off-peak and PM peak volumes, in order to develop a factor to apply to PM peak site-generated volumes
    a. Off-peak volumes are based on the PM peak based on the following:
        i. Off-peak travel demand patterns to large shopping plazas are expected to resemble the PM peak closer than the AM peak. While AM peak volumes are likely primarily driven by employment-based trips made prior to the opening time of Dixie Outlet Mall at 10:00 AM, off-peak and PM peak volumes are more likely to consist largely of retail-based trips;

ii. Based on the traffic TMC data, the magnitude and distribution of volumes in the off-peak at the South Mall Access and Rometown Drive are more comparable to the PM peak;

2. PM peak volumes were multiplied by the generated PM-to-off-peak factor to generate off-peak volumes
    a. Inbound/outbound site volumes expected to travel to/from the south side of the corridor, closer to Lakeshore Road East, were factored based on the Dixie Outlet Mall South Access TMC
    b. Inbound/outbound site volumes expected to travel to/from the north side of the corridor, closer to the Queen Elizabeth Way (QEW), were factored based on the Rometown Drive TMC; then
3. Volumes were distributed corridor-wide.

3.3.2.4 Generated Site Traffic

Exhibit 16 illustrates the network distribution of the generated trips from both Dixie Outlet Mall sites along the study area.

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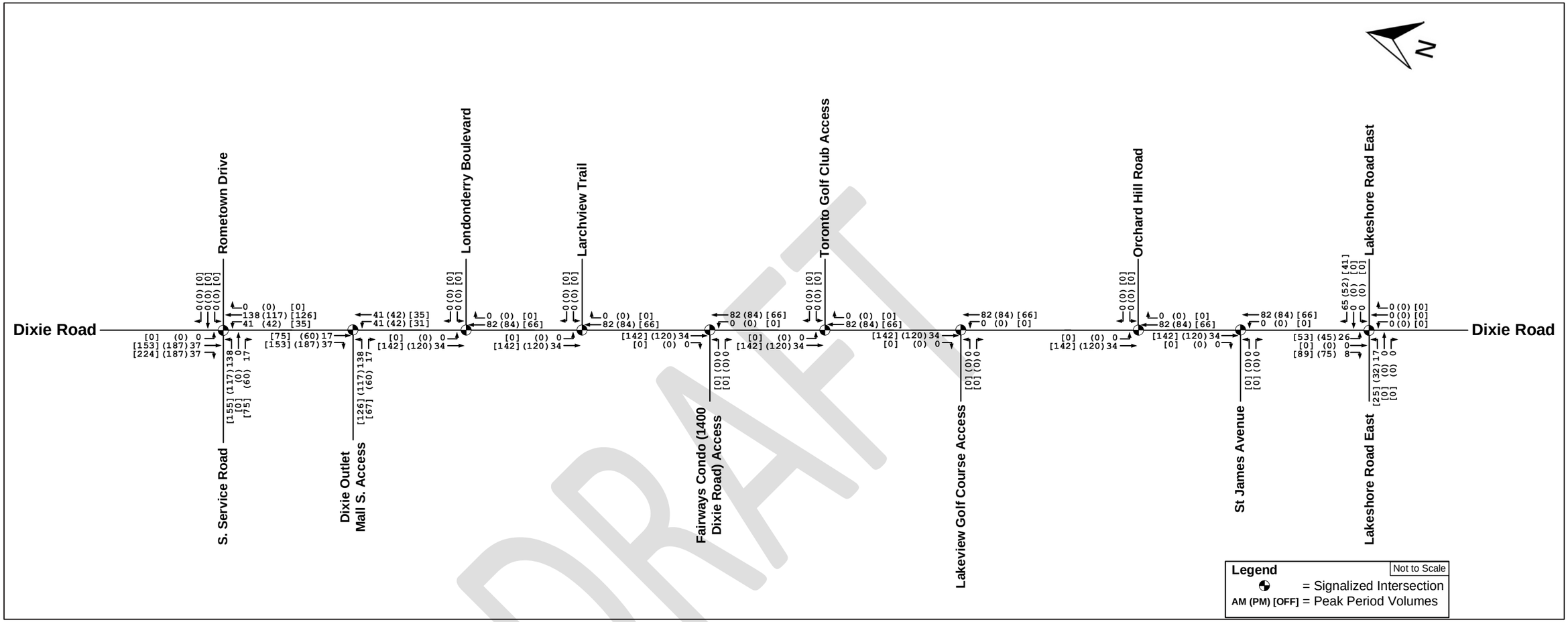
Exhibit 16: Site Trips from Dixie Outlet Mall Developments



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3.3.3 2041 Future Conditions Lane Configuration and Phasing Changes

The following section details changes to intersection lane configurations based on ongoing infrastructure projects in the study area. Further information on anticipated infrastructure projects are detailed in the standalone ***Study Area Profile*** memorandum, submitted March 15, 2024.

3.3.3.1 Lakeshore Road East – Lakeshore BRT

The proposed Lakeshore BRT is expected to intersect with Dixie Road, where far side eastbound and westbound stops are located. As part of the design, the westbound approach has been reconfigured to two through lanes with a single left and right auxiliary turn lane. Additionally, the eastbound left movement's storage length has been significantly increased. Exhibit 17 illustrates the proposed lane configuration on Lakeshore Road East as part of the project.

Exhibit 17: Lakeshore BRT Design at Dixie Road

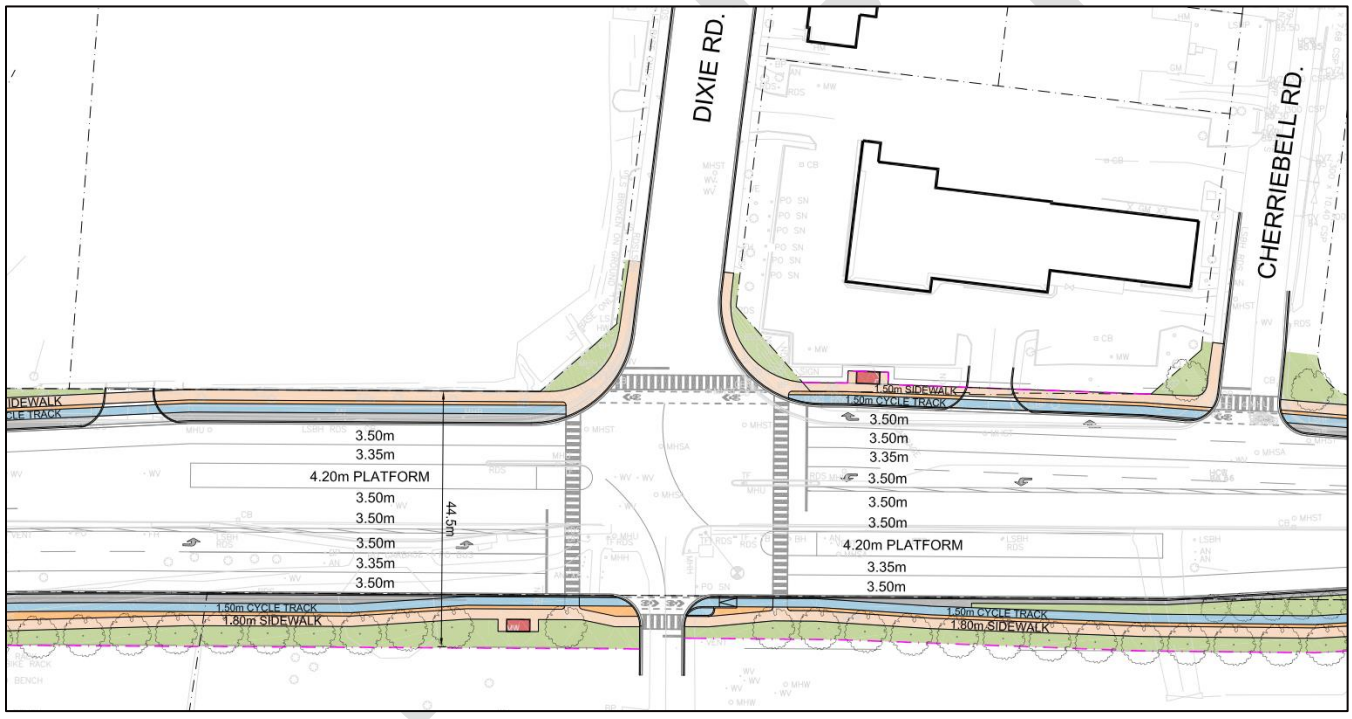


Image Source: Lakeshore Bus Rapid Transit (BRT) Landscape Plan. Retrieved January 2024 from https://www.mississauga.ca/projects-and-strategies/environmental-assessments/lakeshore-bus-rapid-transit-brt-study/

Although no construction timeline has been announced at the time of this study, it is assumed for analysis purposes that the lane configuration would be implemented by the 2041 horizon year, and is therefore reflected in the future conditions model.

3.3.3.2 Lakeshore Road East – Lakeview DXE Club Condos (1345 Lakeshore Road East) Future Development – Potential Lane Configuration Opportunities

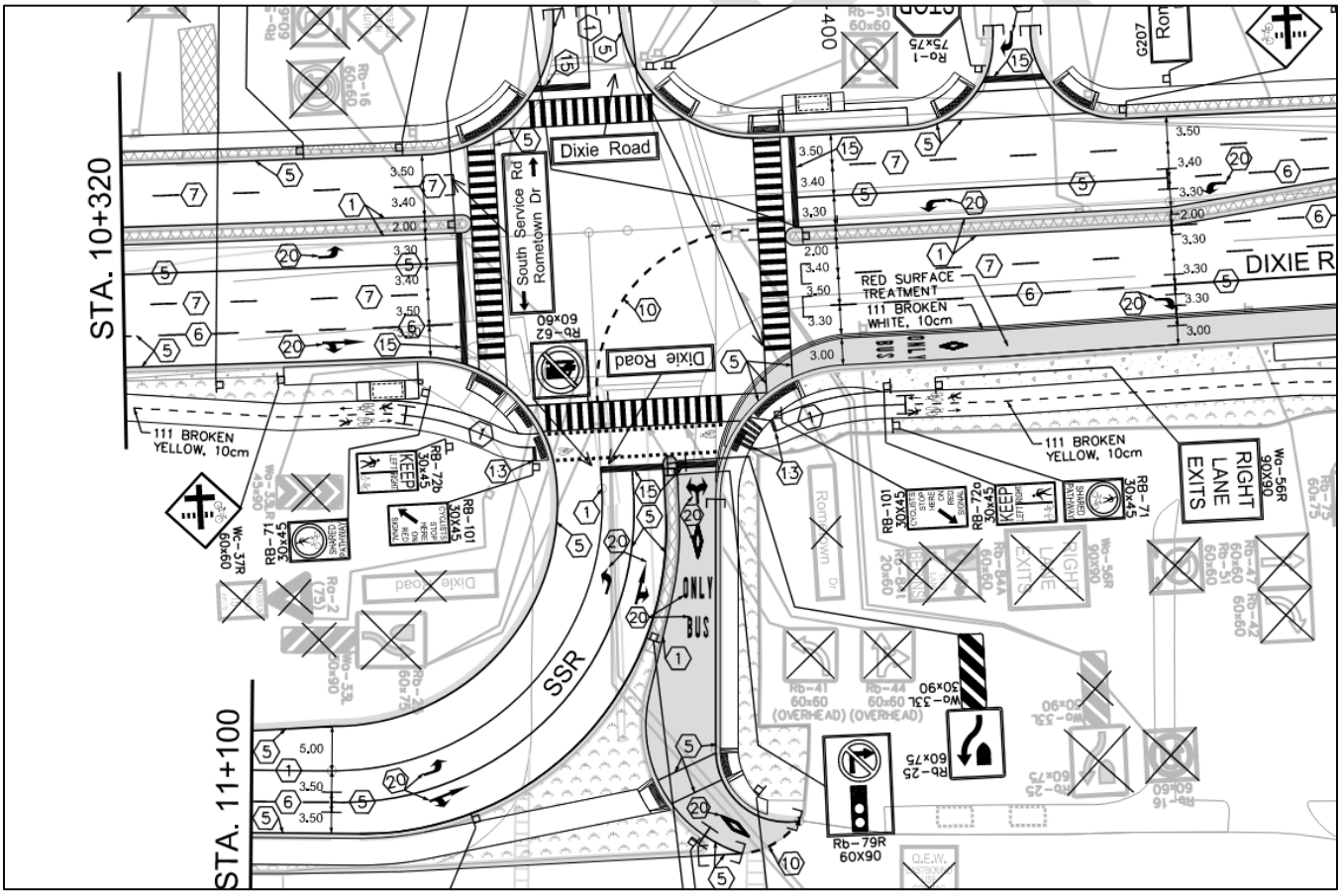
Due to the construction of a future development occurring on the northwest property parcel of Dixie Road and Lakeshore Road East, the Region of Peel had identified that conversations are taking place regarding a potential conversion of the southbound approach to a dual left turn configuration – specifically, a left turn lane, a shared left-through lane, and a right turn lane.

For analysis purposes, this southbound lane configuration is assumed to be implemented by the 2041 horizon year, and as such, is reflected in the future conditions model.

3.3.3.3 South Service Road / Rometown Drive – Transit Priority Phase

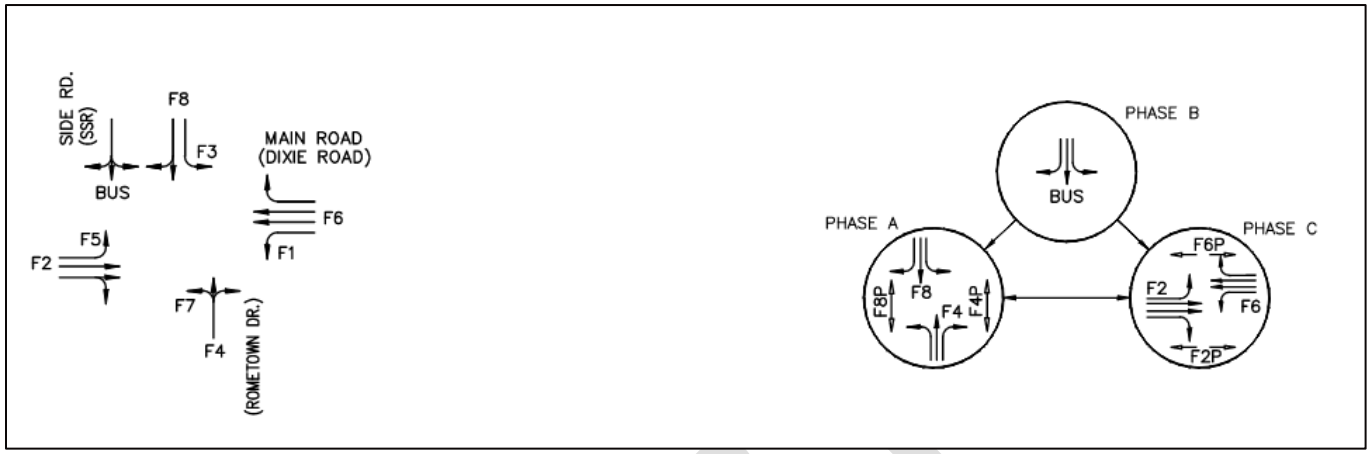
As part of the QEW/Dixie Interchange Improvements project, the received plan drawings illustrate a bus-only lane on the eastbound approach of Dixie Road and South Service Road / Rometown Drive, as shown in Exhibit 18.

Exhibit 18: QEW/Dixie Lane Configuration at Dixie Road and South Service Road / Rometown Drive



As shown in the provided drawing set (excerpt provided in Exhibit 19), the transit priority phase is activated as a phase insert, i.e., activated as its own independent phase.

Exhibit 19: Phasing Diagram at Dixie Road and South Service Road / Rometown Drive



Given that the anticipated completion date for the QEW/Dixie improvements is July 2026, the lane configuration and phasing presented in the received plan drawings is implemented in the future conditions models.

3.3.4 2041 Future Conditions Lane Configuration and Total Volumes

Exhibit 20 and Exhibit 21 illustrate the lane configuration and volumes used for the 2041 Future Conditions scenario, respectively.

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Exhibit 20: 2041 Future Conditions Lane Configurations

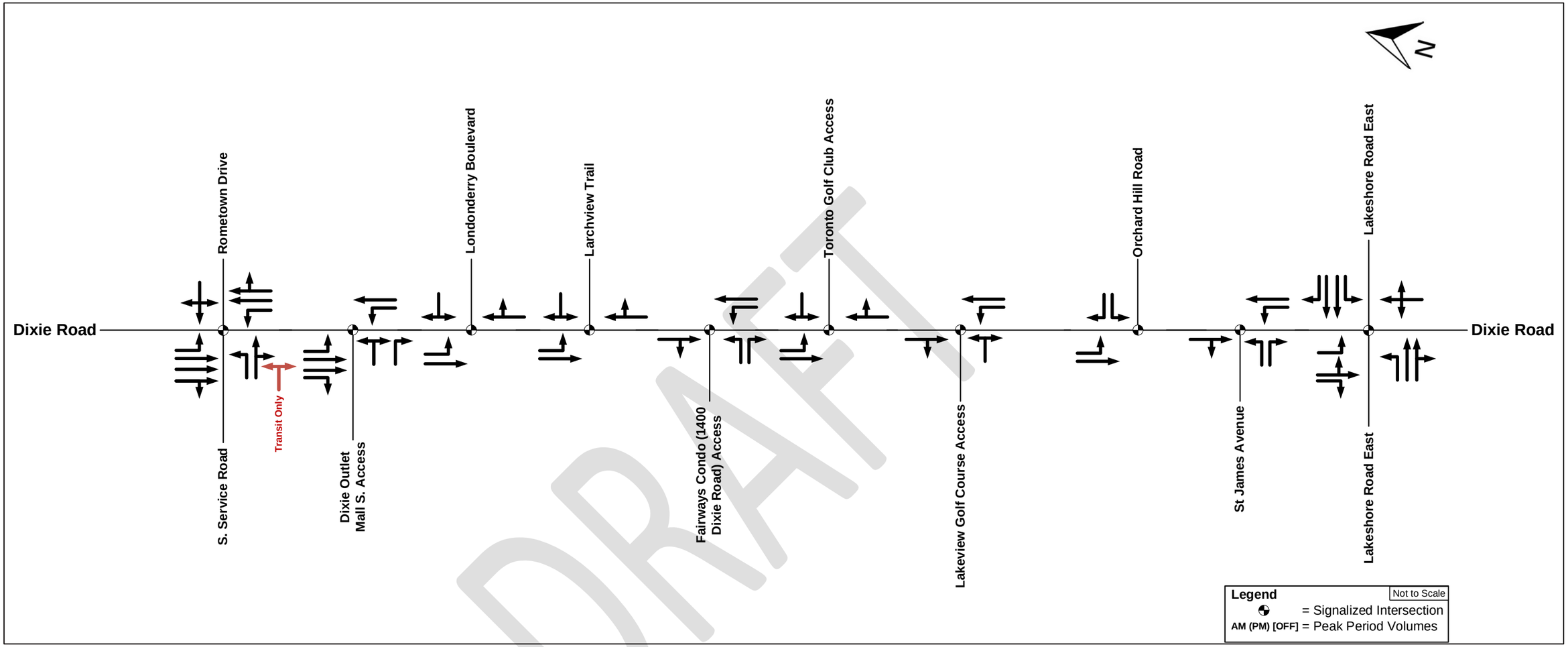

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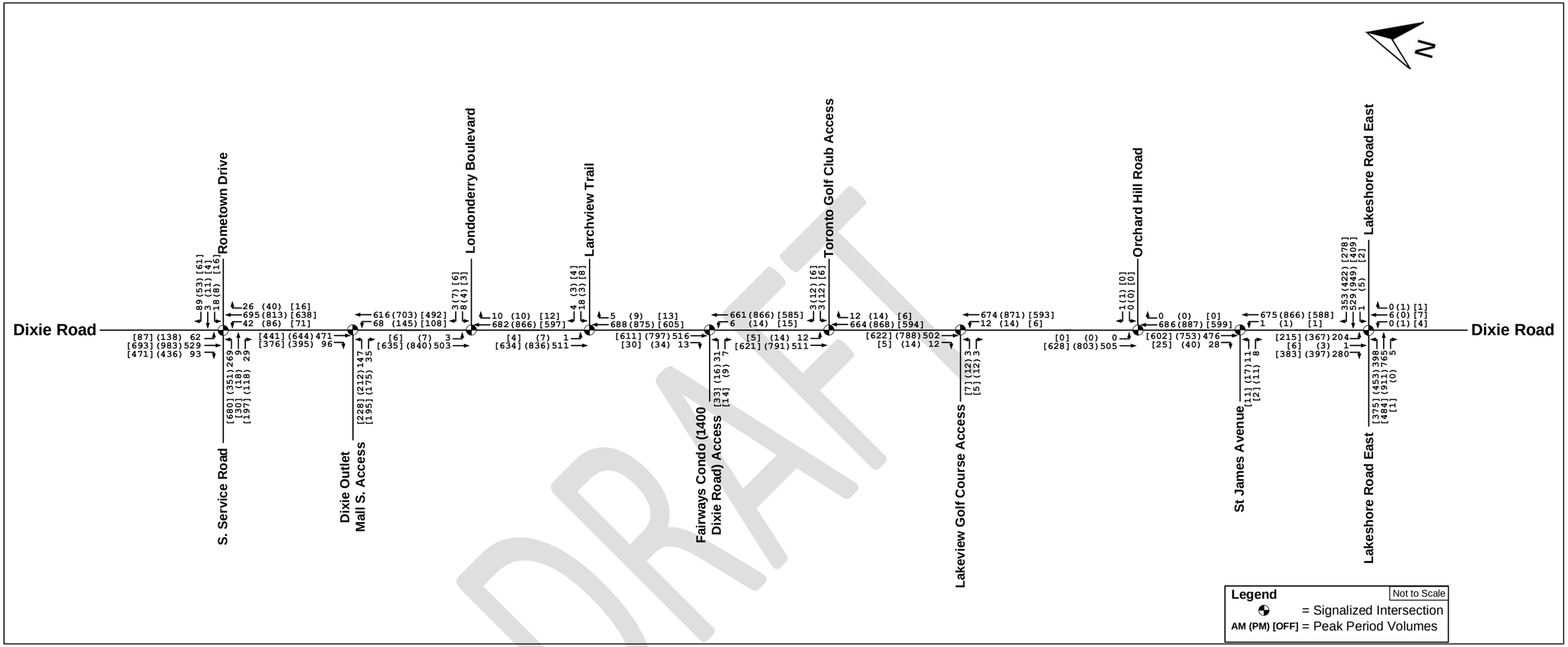
Exhibit 21: 2041 Future Conditions Total Volumes



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3.3.5 2041 Future Conditions Baseline Operational Summary

Exhibit 22 summarizes traffic operations at signalized intersections in the 2041 horizon year, where cycle lengths are kept as-is. Full Synchro results outputs for all signalized and unsignalized intersections in future conditions are provided in **Appendix D**.

Exhibit 22: 2041 Future Conditions – Signalized Intersection Movements Operational Summary

Intersection	Peak Period	Intersection LOS	Intersection Delay	Intersection V/C Ratio	Critical Movement					
					Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)
Dixie Road and Lakeshore Road East	AM	D	36.9	0.59	EBL	F	114.3	1.08	170	285
					EBTR	A	8.5	0.34	84	-
					WBL	E	68.3	0.14	2	27.7
					WBT	C	22.2	0.37	77	-
					WBR	C	21.0	0.24	23	79
					NBLTR	D	42.6	0.02	4	-
					SBL	D	48.1	0.51	34	91.7
					SBT	D	49.0	0.53	35	-
					SBR	D	44.3	0.20	19	131.6
	Off	F	173	0.58	EBL	F	900.1	2.85	186	285
					EBTR	A	9.0	0.25	52	-
					WBL	D	52.1	0.12	3	27.7
					WBT	B	12.2	0.24	46	-
					WBR	B	12.1	0.20	17	79
					NBLTR	C	33.1	0.03	5	-
					SBL	D	37.4	0.46	28	91.7
					SBT	D	37.6	0.48	28	-
					SBR	D	39.4	0.57	37	131.6
	PM	D	44.8	0.84	EBL	F	150.1	1.18	198	285
					EBTR	B	12.2	0.44	104	-
					WBL	E	74.1	0.36	5	27.7
					WBT	C	33.3	0.71	172	-
					WBR	C	26.5	0.34	39	79
					NBLTR	D	37.3	0.00	-	-
					SBL	D	50.3	0.68	60	91.7
					SBT	D	52.4	0.71	61	-
					SBR	D	40.1	0.27	22	131.6

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Intersection	Peak Period	Intersection LOS	Intersection Delay	Intersection V/C Ratio	Critical Movement					
					Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)
Dixie Road and Dixie Outlet Mall South Access	AM	B	15.9	0.49	EBLR	E	56.4	0.64	50	-
					EBR	D	45.5	0.02	9	20
					NBL	A	4.3	0.11	10	20
					NBTR	A	6.7	0.46	85	-
					SBLT	B	11.2	0.19	73	-
					SBR	C	32.9	0.08	28	-
	Off	C	28.5	0.48	EBLR	D	51.1	0.74	73	-
					EBR	D	38.6	0.27	29	20
					NBL	A	7.0	0.19	20	20
					NBTR	A	8.6	0.41	81	-
					SBLT	B	13.2	0.19	50	-
					SBR	E	59.2	0.25	51	-
	PM	B	14.7	0.59	EBLR	E	60.5	0.74	78	-
					EBR	D	47.3	0.31	34	20
					NBL	A	8.2	0.30	31	20
					NBTR	B	10.4	0.56	147	-
					SBLT	A	4.6	0.27	25	-
					SBR	A	2.0	0.29	1	-
Dixie Road and South Service Road / Rometown Drive	AM	C	28.1	0.68	EBL	E	58.0	0.89	90	-
					EBTR	C	23.1	0.07	11	-
					WBLTR	C	28.1	0.11	15	-
					NBL	C	23.4	0.13	18	52.8
					NBTR	C	26.8	0.45	100	-
					SBL	C	20.7	0.28	23	31.4
					SBTR	B	17.9	0.28	47	-
	Off	F	86.1	1.04	EBL	F	301.4	1.57	281	-
					EBTR	C	24.5	0.39	56	-
					WBLTR	C	24.9	0.08	14	-
					NBL	C	34.6	0.49	32	52.8
					NBTR	C	22.6	0.41	70	-
					SBL	B	19.9	0.31	24	31.4
					SBTR	C	20.2	0.50	66	-
	PM	C	29.5	0.8	EBL	F	116.6	1.08	154	-
					EBTR	C	34.0	0.28	42	-
					WBLTR	D	36.7	0.08	16	-
					NBL	C	31.5	0.60	44	52.8

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Intersection	Peak Period	Intersection LOS	Intersection Delay	Intersection V/C Ratio	Critical Movement					
					Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)
					NBTR	B	14.6	0.43	66	-
					SBL	C	21.2	0.48	43	31.4
					SBTR	B	16.8	0.51	88	-

Per Exhibit 11, under existing cycle lengths, the majority of signalized movements in 2041 Future Conditions operate under Region of Peel critical thresholds, except for the following movements:

- Dixie Road and Lakeshore Road East;
  - Eastbound left turn in all peak periods;
  - Westbound left turn in the AM and PM peak;
- Dixie Road and Dixie Outlet Mall South Access;
  - Southbound right turn in the off-peak;
  - Shared eastbound left-right in the AM and PM peak periods; and
- Dixie Road and South Service Road / Rometown Drive – Eastbound left turn in all peak periods.

It should be noted that a majority of turning movements exceeding Region of Peel critical thresholds in 2041 Future Conditions also exceeded thresholds in Existing Conditions. Additionally, all northbound and southbound through movements along Dixie Road, similar to Existing Conditions, operated significantly under critical thresholds. Multiple movements operate at LOS E but with v/c ratios significantly under critical thresholds (v/c 0.90 for through / through-turning movements, v/c 1.00 for exclusive movements) and short queues. It is expected that instances of delay are only experienced by a relatively small number of vehicles.

Furthermore, it is emphasized that congestion on these movements is likely attributed to an insufficient amount of green time allocated to the new traffic demand patterns of the 2041 horizon year, as traffic signal cycle lengths were not modified as part of 2041 Future Conditions. Although these movements are primarily situated at the accesses of major future developments, operations are more likely constrained from a combination of unoptimized signal timings relative to vehicle demand, instead of solely attributed to the increase of vehicle demand from proposed developments.

Exhibit 23 summarizes operations at unsignalized intersections in the 2041 Future Conditions scenario. The results show that all unsignalized intersections along Dixie Road within the study area are expected to operate below critical thresholds (LOS E, v/c 0.90 for through / shared-

through movements, v/c 1.00 for exclusive movements) in the 2041 horizon year, while through movements along Dixie Road are expected to operate within the capacity of the existing 3-lane cross-section.

Exhibit 23: 2041 Future Conditions – Unsignalized Intersection Movements Operational Summary

Intersection	Peak Period	Intersection Delay (s)	Lane	Lane LOS	Lane Delay (s)	Lane V/C Ratio	Lane 95th Percentile Queue (m)
Dixie Road and St James Avenue	AM	0.2	EBL-R	B	13.6	0.03	1
			NBL-T	A	8.6	0.45	0
			SBTR	A	0.0	0.34	0
	Off	0.2	EBL-R	C	15.4	0.03	1
			NBL-T	A	9.0	0.38	0
			SBTR	A	0.0	0.41	0
	PM	0.3	EBL-R	C	16.8	0.06	2
			NBL-T	B	12.2	0.53	0
			SBTR	A	0.0	0.48	0
Dixie Road and Orchard Hill Road	AM	0.0	WBL-R	C	23.6	0.01	0
			NBTR	A	0.0	0.46	0
			SBL-T	A	0.0	0.34	0
	Off	0.0	WBL-R	A	0.0	0.01	0
			NBTR	A	0.0	0.39	0
			SBL-T	A	0.0	0.41	0
	PM	0.0	WBL-R	D	27.3	0.01	0
			NBTR	A	0.0	0.55	0
			SBL-T	A	0.0	0.50	0
Dixie Road and Lakeview Golf Club Access	AM	0.2	EBLR	B	13.2	0.01	0
			NBL-T	A	8.6	0.43	0
			SBTR	A	0.0	0.33	0
	Off	0.2	EBLR	B	14.0	0.03	1
			NBL-T	A	8.9	0.38	0
			SBTR	A	0.0	0.40	0
	PM	0.4	EBLR	C	17.6	0.08	2
			NBL-T	A	9.7	0.56	1
			SBTR	A	0.0	0.51	0
Dixie Road and Toronto Golf Club Access	AM	0.2	WBLR	B	14.0	0.01	0
			SBL-T	A	9.2	0.33	0
			NBTR	A	0.0	0.43	0
	Off	0.2	WBLR	B	13.7	0.03	1
			SBL-T	A	8.8	0.40	0
			NBTR	A	0.0	0.38	0

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Intersection	Peak Period	Intersection Delay (s)	Lane	Lane LOS	Lane Delay (s)	Lane V/C Ratio	Lane 95th Percentile Queue (m)
	PM	0.4	WBLR	C	18.3	0.09	2
			SBL-T	B	10.1	0.51	1
			NBTR	A	0.0	0.56	0
Dixie Road and Fairways Condo (1400 Dixie Road) Access	AM	0.5	EBL-R	B	14.9	0.09	2
			NBL-T	A	8.7	0.44	0
			SBTR	A	0.0	0.35	0
	Off	0.7	EBL-R	B	14.4	0.09	2
			NBL-T	A	9.1	0.36	0
			SBTR	A	0.0	0.39	0
	PM	0.4	EBL-R	C	17.3	0.06	1
			NBL-T	A	9.9	0.53	1
			SBTR	A	0.0	0.50	0
Dixie Road and Larchview Trail	AM	0.3	WBLR	C	15.2	0.06	2
			SBL-T	A	9.3	0.34	0
			NBTR	A	0.0	0.46	0
	Off	0.2	WBLR	B	14.0	0.03	1
			SBL-T	A	8.9	0.38	0
			NBTR	A	0.0	0.39	0
	PM	0.1	WBLR	C	17.0	0.02	1
			SBL-T	A	9.8	0.51	0
			NBTR	A	0.0	0.54	0
Dixie Road and Londonderry Boulevard	AM	0.2	WBLR	C	21.4	0.05	1
			SBL-T	B	10.5	0.16	0
			NBTR	A	0.0	0.45	0
	Off	0.2	WBLR	C	15.2	0.02	1
			SBL-T	A	8.8	0.19	0
			NBTR	A	0.0	0.37	0
	PM	0.2	WBLR	D	25.4	0.06	1
			SBL-T	B	10.5	0.26	0
			NBTR	A	0.0	0.54	0

3.3.5.1 Operational Improvements from Signal Optimization

Operations on critical movements were observed to significantly improve through traffic signal timing modifications in the form of:

- Redistributing additional green time to congested movements;
- Increasing / decreasing cycle lengths to either provide more main street green time or reduce side street delay; and

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- Coordinating offsets to create to allow for consistent progression of vehicles through a series of traffic signals, i.e., to create a “green wave” along Dixie Road.

Exhibit 24 summarizes the operational improvements observed at intersections with critical movements.

Exhibit 24: Changes in Critical Movements After Optimization

Intersection	Peak Period	Movement	Baseline Scenario					Optimized Scenario			
			LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)		LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)
Dixie Road and Lakeshore Road East	AM	EBL	F	114.3	1.08	170	→	E	69.9	0.92	155
		WBL	E	68.3	0.14	2		E	76.9	0.17	2
	Off	EBL	F	900.1	2.85	186		E	68.5	0.91	143
		WBL	D	52.1	0.12	3		E	66.7	0.14	3
	PM	EBL	F	150.1	1.18	198		E	79.7	0.97	188
		WBL	E	74.1	0.36	5		F	82.1	0.38	6
		SBL	D	50.3	0.68	60		E	56.4	0.71	67
		SBT	D	52.4	0.71	61		E	58.8	0.74	68
Dixie Road and Dixie Outlet Mall South Access	AM	EBL-R	E	56.4	0.64	50		D	37.1	0.53	36
		EBL-R	D	51.1	0.74	73		E	60.9	0.77	86
	Off	SBR	E	59.2	0.25	51		A	1.1	0.25	-
	PM	EBL-R	E	60.5	0.74	78		D	40.2	0.64	52
Dixie Road and South Service Road / Rometown Drive	AM	EBL	E	58.0	0.89	90		C	34.9	0.80	65
	Off	EBL	F	301.4	1.57	281		F	90.4	1.09	283
		NBL	C	34.6	0.49	32		F	144.6	1.03	49
	PM	EBL	F	116.6	1.08	154		D	38.5	0.82	90
		NBL	C	31.5	0.60	44		F	80.1	0.90	42

As presented in Exhibit 24, multiple critical movements in the 2041 Future Conditions baseline scenario can be significantly improved with traffic signal optimization.

Exhibit 25 summarizes cycle length changes performed as part of signal timing optimizations.

Exhibit 25: Cycle Length Changes Made During Optimization

Intersection	Peak Period	Baseline Cycle Length (s)	Optimized Scenario Cycle Length (s)	Change (s)
Dixie Road and Lakeshore Road East	AM	120	130	10
	Off	100	126	26
	PM	120	130	10
Dixie Road and Dixie Outlet Mall South Access	AM	120	88	-32
	Off	110	130	20
	PM	130	98	-32
Dixie Road and Rometown Drive	AM	120	88	-32
	Off	110	130	20

Intersection	Peak Period	Baseline Cycle Length (s)	Optimized Scenario Cycle Length (s)	Change (s)
	PM	130	98	-32

Although the LOS of some movements have reached LOS E or LOS F, the delay experienced on the movements are expected to be present only within a small number of vehicles, due to the v/c ratio and 95th percentile queues both remaining significantly under critical thresholds.

At the intersection of Dixie Road and Lakeshore Road East in particular, the fully-protected eastbound and westbound left turns required for the safe passage of the BRT contribute the most to the critical LOS, due to the removal of the permissive phase where vehicles can turn when the oncoming approach is clear of conflicting traffic.

Meanwhile, at the intersection of Dixie Road and South Service Road / Rometown Drive, the introduction of an advanced left turn phase may significantly improve operations on the northbound left turning movement – an option to be explored as part of the standalone ***Alternative Design Concepts*** memorandum.

Additional signal timing plan adjustments in response to qualitative and quantitative observations of operations may be recommended in the 2041 horizon year, when projected changes in traffic volumes and patterns are realized.

3.3.6 Development Traffic

The following section summarizes findings related to existing and future unsignalized accesses along Dixie Road.

3.3.6.1 Auxiliary Right Turn Lane Volumes at Accesses

Per the 2013 Region of Peel Road Characterization Study (Table 5), auxiliary turn lanes are required for new developments if the movements from the major road into the proposed development's access exceed 60 vehicles per-hour.

The following traffic impact studies were reviewed to determine if inbound volumes into development accesses on Dixie Road would exceed 60 vehicles per-hour, and therefore warrant the inclusion of an auxiliary right turn lane:

- BA Group – 1345 Lakeshore Road East Urban Transportation Considerations (August 2020); and
- Nextrans – 1381 Lakeshore Road East Transportation Impact Study (December 2023).

The Lakeview Village site does not contain unsignalized accesses along Dixie Road within the study area, while movements from Dixie Road into the Dixie Outlet Mall developments are served

by signalized intersections. As such, developments pertaining to these two sites were not evaluated.

Exhibit 26 summarizes the volumes projected for both sites at accesses along Dixie Road.

Exhibit 26: Dixie Road Development Access Volume Summary

Development	Access Movement from Dixie Road	Traffic Impact Study Projected Access Volume (vph)	Auxiliary Turn Lane Requirement
1345 Lakeshore Road East	SBR	20 (55)	Auxiliary turn lane not required. Volume < 60 vph
1381 Lakeshore Road East	NBR	5 (15)	Auxiliary turn lane not required. Volume < 60 vph

AM (PM) = Peak Period Volume

Per Exhibit 26, auxiliary right turn lanes are not expected to be required for accesses into 1345 Lakeshore Road East and 1381 Lakeshore Road East from Dixie Road.

3.3.6.2 Access Spacing Requirements

The Region of Peel Road Characterization Study (2013) recommends that roadways classified as Suburban Connectors should maintain a minimum spacing of:

- 300 metres between full-move accesses;
- 150 metres between full-move intersections to left-in / right-in / right-out accesses with medians, or between two left-in / right-in / right-out accesses with medians; and
- 75 metres between any general intersection configuration and a right-in / right-out access.

Almost all accesses on Dixie Road within the study area, including the proposed right-in-right-out accesses onto Dixie Road from developments at 1345 Lakeshore Road East and 1381 Lakeshore Road East, are spaced below this minimum recommendation. However, it is likely that modifications to these accesses are not required for the 2041 horizon year, for the following reasons:

- Dixie Road operates below critical thresholds on most approaches adjacent to development accesses in the 2041 horizon year, except for the southbound approach at Dixie Road & Lakeshore Road East due to traffic signal optimization-related factors; and
- Proposed accesses on Dixie Road are limited to right-in / right-out movements under 60 vehicles per-hour. As such, operational impacts along Dixie Road are expected to be limited, and isolated to right turning movements in and out of the access, with no auxiliary lanes required per the 2013 Road Classification Study.

3.3.6.3 Queueing Impacts to 1345 Lakeshore Road East Access

As shown in Exhibit 22 in Section 3.3.5, queues observed in the 95th percentile from southbound movements of Dixie Road and Lakeshore Road East in the PM peak period are likely expected to spill back to the proposed right-in / right-out access of 1345 Lakeshore Road East, located on Dixie Road roughly 40 metres north of the intersection.

All inbound and outbound movements from the proposed development at 1345 Lakeshore Road East are not expected to be critically impacted, as an alternate full-movement access is located west of the intersection of Dixie Road and St. James Avenue per its site plan.

3.3.7 Cycling Safety Improvements – Protected Phase Review

Fully-protected phases are proposed on the basis of vulnerable road user safety, and intend to fully separate motor vehicle left turning movements from through movements of vulnerable road users, eliminating motor vehicle left-hook and right-hook conflicts with pedestrians and cyclists while simultaneously reducing driver workload.

A protected phase review was conducted for all signalized intersections in the study area. The protected phase review methodology is guided by Table 6.2 in OTM Book 18 – presented in Exhibit 27. Protected signal phasing for a vehicular movement is recommended when motor vehicle turning volume thresholds in Table 6.2 are exceeded to enhance comfort and safety for through cyclists. Turning volume thresholds for each movement were taken to be the maximum among all evaluated peak hours (AM, PM, Off). In cases where volume thresholds are not met, protected-permissive phasing should be considered instead.

Exhibit 27: Protected Phase Review – Motor Vehicle Turning Volume Thresholds for Protected Signal Phasing (Adopted from OTM Book 18 Table 6.2)

In-boulevard or On-Street Cycling Facility Operation	Motor Vehicles Per Peak Hour Turning Across Cycling Facility			
	Two-way Street			One-way Street
	Right Turn	Left Turn Across One Lane	Left Turn Across Two or More Lanes	Right or Left Turn
One-Way	150	100	50	150
Two-Way	100	50	0	100

The results of the protected phase review are summarized in Exhibit 28. Note that the protected phase review assumes that the current cycling infrastructure and lane configuration remains unchanged in the 2041 horizon year.

Exhibit 28: Dixie Road Protected Phase Review

Intersection	Crossing Side	Volume Threshold	Existing Conditions TMC Volume	2041 Future Conditions Volume	Protected Phase Warranted	
					Existing	2041 Future
Dixie Road and Lakeshore Road East	East Leg[2] (SBL)	100	**124 (253) [131]**	**204 (367) [215]**	**Yes**	**Yes**
	East Leg (NBR)	150	0 (1) [1]	0 (1) [1]	No	No
	West Leg (NBL)	100	0 (1) [4]	0 (1) [4]	No	No
	West Leg (SBR)	150	**189 (252) [238]**	**280 (397) [383]**	**Yes**	**Yes**
Dixie Road and Dixie Outlet Mall South Access	West Leg (NBL)	50	25 **(82) [76]**	**68 (145) [108]**	**Yes**	**Yes**
	West Leg (SBR)	150	59 **(208) [223]**	96 **(395) [376]**	**Yes**	**Yes**
	East Leg (SBL)	50	0 (0) [0]	0 (0) [0]	No	No
	East Leg (NBR)	150	0 (0) [0]	0 (0) [0]	No	No
	North Leg (EBL)	50	9 **(95) [102]**	**147 (212) [228]**	**Yes**	**Yes**
Dixie Road and Rometown Drive	West Leg (NBL)	0	**1 (25) [24]**	**42 (86) [71]**	**Yes**	**Yes**
	West Leg (SBR)	100	54 **(197) [236]**	93 **(436) [471]**	**Yes**	**Yes**

AM (PM) [OFF] = Peak Period Volume

Based on the results of Exhibit 28, fully-protected phases are recommended on multiple turning movements on Dixie Road:

- Fully-protected phase warrants on the south end of the corridor, at Dixie Road and Lakeshore Road East, are triggered due to high left turning demand; and
- Warrants near the Dixie Outlet Mall site are triggered as a result of the high conflict potential of the existing bi-directional multi-use path, alongside the need for vehicles to negotiate multiple lanes of oncoming traffic to complete a turn, adding to driver workload.

[2] An east leg crosswalk / cycling facility is not present in existing conditions, but was evaluated regardless, as they may be considered in the design option development phase.

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It should be noted that the Region of Peel typically only proposes single-lane fully-protected left turn phases at locations that contain high preventable collision rates, or vehicle sightlines that do not meet the standards outlined by the TAC Geometric Design Guide. Final recommendations regarding fully-protected phases are to be determined once the preferred design is decided.

An operational sensitivity analysis on fully-protected movements is to be performed as part of the ***Alternative Design Concepts*** memorandum.

3.3.8 Cycling Safety Improvements – Leading Pedestrian Intervals (LPIs) & Leading Bicycle Intervals (LBIs)

LPIs and LBIs provide advanced walk signals and bicycle green signals, respectively, to allow pedestrians and cyclists to enter the intersection before vehicles receive a green light. By allowing vulnerable road users to enter the intersection prior to the vehicle green, the visibility of pedestrians and cyclists is generally increased, therefore reinforcing their right-of-way during interactions with turning vehicles.

LPIs and LBIs are compatible only on crosswalks and approaches where there are no conflicting advanced turning phases in the same or opposing direction of the crosswalk or approach, during any time of the day. For example, LPIs / LBIs on the east / west crosswalks (northbound / southbound cyclist) of an intersection cannot be implemented if a northbound or southbound advanced left turn phase is active during any time of the day. Similarly, for north / south crosswalks (eastbound / westbound cyclists), LBIs / LBIs cannot be implemented if an eastbound or westbound advanced left turn phase is active during any time of the day.

As such, LPIs and LBIs are proposed only where there are no advanced turning phases on the approach or opposing direction of the crosswalk, or where operations are not adequate when movements are converted to a fully-protected phase.

An operational sensitivity analysis on LPIs / LBIs is to be performed as part of the ***Alternative Design Concepts*** memorandum.

3.3.9 Operational Improvements – Advanced Left Turn Phases

Per OTM Book 12, advanced left turn phases may be justified if:

1. The left-turning vehicles are not finding suitable turning gaps, volume exceeds at least two vehicles per cycle, and the Level of Service at the intersection will not significantly decrease with the implementation of an advanced left turn phase; or
2. If the left-turning volume plus the opposing volume > 720 vehicles per hour; or
3. If a field check shows that vehicles consistently require more than two cycles in the queue in order to turn left; or
4. If an over-representation of left turning collisions is identified at the intersection.

During field visits conducted as part of the Study Area Profile memo, all left turning queues were found to clear in one or two cycles. However, the following intersections in Exhibit 29 are anticipated to meet or exceed the volume thresholds outlined in Justification 2.

Exhibit 29: Advanced Left Turns Justified on Basis of Volume (Justification 2)

Intersection	Movement Group	Peak Hour Left Turn + Opposing Volume (2023 Existing Conditions)	Peak Hour Left Turn + Opposing Volume (2041 Future Conditions)	Advanced Left Turn Justification Result
Dixie Road & Lakeshore Road East	NBL + SBT	1 (3) [9]	1 (4) [10]	No
Dixie Road & Lakeshore Road East	SBL + NBT	128 (253) [136]	204 (368) [222]	No
Dixie Road & Lakeshore Road East	EBL + WBT	653 (973) [540]	927 (1402) [784]	**Yes (Existing)**
Dixie Road & Lakeshore Road East	WBL + EBT	643 (719) [408]	766 (916) [486]	**Yes (Future)**
Dixie Road & Dixie Outlet Mall South Access	NBL + SBT	416 (544) [426]	539 (789) [549]	**Yes (Future)**
Dixie Road & Dixie Outlet Mall South Access	SBL + NBT	509 (414) [433]	616 (703) [492]	**Yes (Future)**
Dixie Road & Dixie Outlet Mall South Access	EBL + WBT	9 (95) [102]	147 (212) [228]	No
Dixie Road & Rometown Drive	NBL + SBT	360 (499) [369]	571 (1069) [764]	**Yes (Future)**
Dixie Road & Rometown Drive	SBL + NBT	457 (508) [432]	757 (951) [725]	**Yes (Future)**
Dixie Road & Rometown Drive	EBL + WBT	46 (141) [176]	272 (362) [684]	No
Dixie Road & Rometown Drive	WBL + EBT	17 (16) [21]	27 (26) [46]	No

AM (PM) [OFF] = Peak Period Volume

An operational sensitivity analysis on advanced left turn movements is to be performed as part of the ***Alternative Design Concepts*** memorandum.

3.3.10 Traffic Signal Warrants

Guided by the methodology outlined in Ontario Traffic Manual (OTM) Book 12, traffic signal warrants were conducted for all unsignalized intersections in the study area, as well as at accesses for proposed developments at 1345 Lakeshore Road East and 1381 Lakeshore Road East.

The following data was used as inputs for the signal warrant process:

- TMCs provided by the Region of Peel for all unsignalized study area intersections;
- Projected Future Total volumes for the 2041 horizon year; and
- Collision data along Dixie Road, between 2018 and 2022.

In both existing and future conditions, OTM Book 12 traffic signal warrant justifications 1 through 7 indicated that **no new traffic signals are warranted to be installed at any unsignalized intersection location along the study area.**

Signal warrant analysis summaries are compiled in **Appendix E**.

3.4 Traffic Operations Recommendations

Based on the analysis results, the following recommendations are made:

- Maintain Dixie Road between Lakeshore Road East and the Dixie Outlet Mall South Access as a 2-lane roadway in the 2041 horizon year, on the basis of adequate operations, and ability to reduce most high-demand movements below critical thresholds through traffic signal optimization;
- Consider the implementation of fully-protected left turn phases at the following intersections:
  - Dixie Road and Lakeshore Road East (East Leg);
  - Dixie Road and Dixie Outlet Mall South Access (West and North Legs);
  - Dixie Road and Rometown Drive (West Leg);
- Consider the implementation of fully-protected right turn phases at the following intersections:
  - Dixie Road and Lakeshore Road East (West Leg);
  - Dixie Road and Dixie Outlet Mall South Access (West Leg);
  - Dixie Road and Rometown Drive (West Leg); and
- Consider additional signal timing plan adjustments in response to qualitative and quantitative observations of operations in future horizon years, when projected changes in traffic volumes and patterns are realized.

3.4.1 2051 Horizon Year Sensitivity Analysis

This section outlines the methodology used to confirm that analysis recommendations are consistent in the 2051 horizon year.

3.4.1.1 Extrapolation of 2016-2041 EMME Plots to 2051

To develop 2051 horizon year volumes, growth rates developed from 2016-2041 EMME plots provided by the City of Mississauga were extrapolated to the 2051 horizon year by using 2016-

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2051 area Land Use Forecasts provided by the City of Mississauga. Note that it was chosen to extrapolate the previously received EMME plots instead of utilizing growth rates directly from the Land Use Forecast.

While the 2016-2051 Land Use Forecasts predict the overall growth of population + employment zones instead of specific roads, the 2016-2041 EMME plots detail growth on specific links / roads within the network, potentially providing a more accurate prediction of how Dixie Road specifically will grow in future horizons.

For example, by the methodology of the Land Use Forecasts, any growth in a population + employment zone which includes Dixie Road, Haig Boulevard, and Applewood Road would assume that this growth is distributed equally across all roads, instead of by distinct proportions based on roadway capacity from number of lanes, posted speeds, and other factors as the EMME plots would do.

The most recent revision of these land use forecasts, dated August 2024, is noted to account for growth at the Dixie Outlet Mall site, which is assumed to achieve full buildout in 2041. As such. the following steps were performed to develop a corridor-wide growth rate from 2041 to 2051 for the AM and PM peak:

- Population and employment numbers were summed for zones adjacent to the Dixie Road study area for the 2016, 2041, and 2051 forecasted years;
- The CAGR formula was used to develop a network-wide growth rate based on Land Use Forecast numbers, which returned:
  - A CAGR of 2.9% between 2016-2041; and
  - A CAGR of 2.5% between 2041-2051;
- A scaling factor was developed by dividing the 2016-2041 EMME CAGRs (outlined in Section 3.3.1) by the 2016-2041 Land Use Forecast CAGRs, which returned the following ratios:
  - **Dixie Road:**
    - 10.2% of Land Use Forecast CAGR in the AM Peak;
    - 47.6% of Land Use Forecast CAGR in the PM Peak;
  - **Lakeshore Road East**
    - 34.0% of Land Use Forecast CAGR in the AM Peak;
    - 47.6% of Land Use Forecast CAGR in the PM Peak; then
- The 2041-2051 CAGR of 2.5% developed by the Land Use Forecast was then multiplied by these factors to develop the CAGRs to be applied for 2051 analysis, which are as follows:
  - **Dixie Road:**
    - 0.3% in the AM Peak;

  - 1.2% in the PM Peak;
- **Lakeshore Road East**
  - 0.8% in the AM Peak; and
  - 1.2% in the PM Peak.

At South Service Road / Rometown Drive, the calculations were performed relative to the 2016-2041 growth rate observed on the QEW, instead of the growth rate observed on the South Service Road ramp.

This is because the demand induced by the new QEW off-ramp into the extended South Service Road is assumed to occur acutely and within a short period of time after opening day (assumed before 2041). Beyond this timeframe, i.e., between 2041 and 2051, it is expected that traffic growth at the new ramp will eventually normalize to the growth of the surrounding road network and grow at a rate in-line with the QEW.

As such, calculations returned the following 2041-2051 CAGR for the eastbound approach of Dixie Road and South Service Road / Rometown Drive:

- 0.1% in the AM Peak; and
- 0.2% in the PM Peak.

3.4.1.2 2051 Future Conditions Operational Summary

To develop a 2051 Future Conditions model, CAGRs were applied to the respective through movements, and signal timings were re-optimized. Exhibit 30 summarizes movements which exceed critical thresholds in the 2051 horizon year.

Exhibit 30: 2051 Future Conditions Critical Movements

Intersection	Peak Period	Critical Movement						Critical Movement in 2041?
		Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)	
Dixie Road and Lakeshore Road East	AM	EBL	E	75.8	0.96	174	285	Y
		WBL	E	76.9	0.17	2	27.7	Y
		SBT	E	55.4	0.60	43	-	
	Off	EBL	E	67.2	0.90	146	285	Y
		WBL	E	68.5	0.15	3	27.7	
	PM	EBL	F	81.1	0.98	213	285	Y
		WBL	F	98.5	0.50	6	27.7	Y
		SBL	E	69.3	0.81	89	91.7	
		SBT	E	74.9	0.84	91	-	

Intersection	Peak Period	Critical Movement						Critical Movement in 2041?
		Movement	LOS	Delay (s)	V/C Ratio	95th Percentile Queue (m)	Storage Capacity (m)	
Dixie Road and Dixie Outlet Mall South Access	AM	EBLR	F	81.1	0.73	67	-	Y
		EBR	E	62.4	0.06	13	20	
	Off	EBLR	E	76.5	0.80	106	-	
		EBR	E	58.6	0.40	51	20	
Dixie Road and South Service Road / Rometown Drive	AM	EBL	E	62.6	0.86	106	-	Y
	Off	EBL	F	123.8	1.15	350	-	Y
		NBL	F	143.4	1.04	70	52.8	
	PM	EBL	E	58.5	0.92	123	-	Y
		NBL	F	107.6	1.03	56	52.8	

Per Exhibit 30, additional movements are expected to exceed Region of Peel critical thresholds. However:

- Nine of these movements already exceed critical thresholds in the 2041 horizon year;
- The majority of movements which do exceed critical thresholds are not located on the two-lane section of Dixie Road, but instead either on the multi-lane section between the Dixie Outlet Mall South Access and Rometown Drive, or on Lakeshore Road East;
- While the southbound movements at Dixie Road and Lakeshore Road East are located on the two-lane section of Dixie Road, their v/c ratio remains under 1.00. As such, it is expected that queues on these movements will likely still be able to clear in one cycle most of the time; and
- As a centre-running BRT with stops at Dixie Road and Lakeshore Road East, as well as east/west cycle tracks are proposed as part of the Lakeshore Bus Rapid Transit (BRT) project, anticipated modal shifts may potentially reduce the number of trips taken by motor vehicles in future horizon years. Additionally, changes in intersection lane configurations in the form of dedicated turning lanes may also aid in improving operations at the intersection to below critical thresholds.

As such, the recommendations listed in Section 3.4 are consistent for the 2051 horizon year.

4 Traffic Safety

The following section summarizes findings from the In-service Road Safety Review (ISSR).

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4.1.1 ISSR Findings

In the ISSR, the following key observations were noted for the Dixie Road corridor within the study area:

- Out of 38 collisions documented between 2018 to 2022, 34 were classified as Property Damage Only (PDO) collisions, with 3 classified as Non-Fatal Injury, and 1 classified as Fatal;
- Among all collisions, there were 13 (34%) rear-end collisions (including a cyclist collision that resulted in injury), 10 (26%) turning movement collisions, 7 (18%) sideswipe collisions, 5 (13%) Single Motor Vehicle collisions (including a pedestrian collision that resulted in a fatality), 2 (5%) approaching collisions, and 1 (3%) angle collision;
- Major contributing factors to occurrences of more severe collisions generally result from drivers disobeying traffic control devices or driving improperly (exceeding the posted speed limit, improper turns, etc.);
- The majority of collisions occurred at the intersections of Dixie Road and Lakeshore Road East (19 total), Dixie Road and Rometown Drive (9 total);

4.1.1.1 Intersection Geometric Review

The following observations were noted during the geometric review within the draft ISSR:

- Most of the parallel lanes at the three signalized intersections in the study area (Lakeshore Road East, Dixie Outlet Mall South Access, and Rometown Drive) do not comply with deceleration requirements. However, guidance from the TAC Geometric Design Guide for Canadian Roads (Chapter 9) states that in an urban environment, deceleration (up to 15 km/h) over the bay taper is normally tolerable, especially in peak-hour conditions;
  - Despite the substandard taper and parallel lane lengths, the lack of recorded collisions that can be associated to these elements suggests that the existing geometries may be sufficient for prevailing operating conditions;
- The field investigations and desktop review revealed that the available sight distance at the stopping position (i.e., behind the stop bar) on side streets (i.e., St. James Avenue, Orchard Hill Road, Larchview Trail, and Londonderry Boulevard) do not meet these requirements due to sight obstructions such as vegetation, hydro poles, and road vertical curvature along Dixie Road;
  - The TAC Geometric Design Guide for Canadian Roads specifies that for a 50 km/h design speed, a minimum intersection sight distance of 105 m and 95 m is required for left-turn and right-turn movements from a stop-controlled intersection approach, respectively;
  - In all these cases, drivers tend to advance and encroach the pedestrian crossing location to improve their sightlines before making turning movements; and

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- Similar to taper and parallel lane observations, sight distance limitations have not manifested in the deterioration of safety performance in terms of recorded collisions.

Further detailed observations and recommendations are provided in the draft ISSR. The Dixie Road Complete Corridor Study will examine design and operational refinements to incorporate these recommendations.

5 Sustainable Transportation Planning

An essential element of this corridor study is improving and enhancing the pedestrian and cycling realm in support of the Region's sustainable mode share targets. The following sections provide an overview of key considerations to inform the development of design options.

5.1 Pedestrian Infrastructure

The following section summarizes observations related to pedestrian facilities along the Dixie Road study area.

5.1.1 Sidewalk Review

An in-field review of pedestrian facilities was conducted along Dixie Road during project initiation. Detailed findings are documented in the standalone ***Study Area Profile*** memorandum, dated March 15, 2024. The following observations pertaining to pedestrian facilities on Dixie Road were noted during site reconnaissance:

- Overall, pedestrian facilities along Dixie Road, except for below the CN Rail underpass, are in a state of good repair;
- Facility conditions under the CN Rail underpass are poor – notably on the west sidewalk, where poor pavement conditions, damaged or missing railings, low-hanging branches encroaching the pedestrian right-of-way, and pooling were noted. These facilities will be upgraded in Summer 2024 through upcoming construction;
- A continuous concrete sidewalk is present on both sides of Dixie Road within the study area. However, sidewalks are absent on most side streets intersecting with the corridor, except for the Dixie Outlet Mall access, the south leg of St James Avenue, and both legs of Lakeshore Road East (the south east corner is missing sidewalks heading easterly away from the intersection);
- At most signalized intersection corners, the curb ramp is aligned with the painted crosswalk, except for the northeast and southeast crossings at Dixie Road and Rometown Drive;
- All pedestrian crossings along the corridor lack Tactile Walking Surface Indicators (TWSI);

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- All pedestrian crossings, except for the ones at the Dixie Outlet Mall South Access, lack Accessible Pedestrian Signals (APS);
- The majority of crosswalks at unsignalized intersections are not painted, except at Londonderry Boulevard; and
- A pinch point, meaning AODA clear zone width is not provided, is identified on the west side sidewalk across from Londonderry Boulevard, where a utility pole is installed in the middle of the sidewalk.

5.1.2 Accommodation of Midblock Crossings

The Dixie Road corridor offers only a few east-west formal pedestrian crossing opportunities, as summarized in Exhibit 31.

Exhibit 31: Crossing Locations along Dixie Road Study Area

Crossing Location	Type	Distance to Next Crossing to the North
Lakeshore Road East	Signalized Intersection	1,500 m
Dixie Outlet Mall South Access	Signalized Intersection	125 m
Rometown Drive	Signalized Intersection	600 m

Providing safe and comfortable pedestrian crossings at reasonable frequency is an important aspect of promoting neighbourhood walkability. The Region's Sustainable Transportation Strategy notes that an "important need is for more safe crossing opportunities that improve the visibility of vulnerable road users and reduce vehicle speeds" (p. 23). Guidance on appropriate spacing for controlled pedestrian crossings varies:

- NACTO Urban Street Design Guide suggests: "Locate pedestrian crossings as per current or projected pedestrian desire lines. Balance their placement with that of the motorized traffic network, so as to not severely compromise either. There is no absolute rule for crosswalk spacing. Rather it depends on block length, street width, building entrances, traffic signals, etc. 120-200' [36-60m] has been shown to be sufficient." The guide also notes that signalized crossings: "should typically be permitted at a minimum of 200 foot [60m] spacing (or approximately one short city block)."
- The City of Mississauga Pedestrian Master Plan Appendix B notes: "Mid-block crossing[s] work especially well where intersections are spaced at least 100 to 200 metres apart and there are destinations on both sides of the road. Mid-block crossings are often considered where there are major pedestrian generators mid-block and at locations where there is a desire line."

- York Region's Pedestrian and Cycling Planning and Design Guidelines notes "a stretch of Regional road with signals spaced as little as 400 m may be a good candidate for a mid-block crossing if there are major destinations located mid-block."

Based on the above guidance, a review of potential midblock pedestrian desire lines was completed. 1400 Dixie Road (Fairways Condo), a significant trip generator situated between the Dixie Outlet Mall and Lakeshore Road East, was identified as a potential pedestrian crossing desire line due to the absence of signalized crossing locations within 400 m of the residence, as illustrated in Exhibit 32.

Exhibit 32: Location of Signalized Intersections / Crossings Relative to Fairways Condo (1400 Dixie Road) Access

A pedestrian crossing warrant following the process in OTM Book 15 was completed for this location (refer to **Appendix F**) and the results indicate a **Level 2 Type B Pedestrian Crossover (PXO)** is an appropriate intervention for this site. However, it is recommended that a **Midblock Pedestrian Signal (MPS)** is also considered due to the following rationale:

- Dixie Road's curb-to-curb cross-sectional width was not modified during its 2016 conversion from 4 lanes to 3 lanes with cycling facilities. I.e., the crossing distances on Dixie Road are equivalent to that of a 4-lane road; and
- The footnotes of OTM Book 15's Pedestrian Crossover Selection Matrix state that "The total number of lanes is representative of crossing distance" and that "A cross sectional feature (e.g. bike lane or on-street parking) may extend the average crossing distance beyond this range of lane widths."

Under the rationale that Dixie Road is equivalent in width to a 4-lane road, the OTM Book 15 Pedestrian Crossover Matrix would warrant an MPS for the Fairways Condo intersection, as shown in Exhibit 33.

Exhibit 33: Pedestrian Crossover Selection Matrix – Dixie Road & Fairways Condo (1400 Dixie Road) Access

Two-way Vehicular Volume			Posted Speed Limit (km/h	Total Number of Lanes for the Roadway Cross Section[1]			
Time Period	Lower Bound	Upper Bound		1 or 2 Lanes	3 lanes	4 lanes w/raised refuge	4 lanes w/o raised refuge
8 Hour	750	2,250	≤50	Level 2 Type D	Level 2 Type C[3]	Level 2 Type D[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	750	2,250	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	2,250	4,500	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	4,500	6,000	≤50	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 1 Type A
4 Hour	3,155	3,950					
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B		
4 Hour	3,155	3,950					
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B		
4 Hour	3,950	9,215					
8 Hour	7,500	17,500	60	Level 2 Type B			
4 Hour	3,950	9,215					

As such, it is recommended that either a Level 2 Type B PXO or an MPS should be considered for the Fairways Condo intersection.

5.2 Cycling Facilities

The 2015 Bike Feasibility Study ultimately led to the implementation of the lane reconfiguration of the existing buffered bike lanes along Dixie Road. Since 2015/2016, best practices in planning and design of cycling infrastructure have evolved. An updated OTM Book 18 was released in 2021 which includes an update to the 3-step cycling facility selection review process. The following sections summarize the application of that guidance to the Dixie Road corridor.

5.2.1 Methodology

A high-level facility selection review was carried out for the study area to determine the most appropriate cycling facility type for Dixie Road. For the purposes of the cycling facility selection review, the study area for this project is separated into the following sections:

- Segment 1: Between Lakeshore Road East to Fairways Condo (1400 Dixie Road) Access;
- Segment 2: Between Fairways Condo (1400 Dixie Road) Access to Dixie Outlet Mall South Access; and
- Segment 3: Between Dixie Outlet Mall South Access to Rometown Drive.

The review was completed using the following tools:

OTM Book 18 (2021) Bicycle Facility Type Selection Process

OTM Book 18 outlines a process for identifying the minimum class of facility (shared, designated or separated) based on roadway characteristics like vehicle speed, volume, and lane configuration. The first two steps in the process were used to inform this study which include Step 1: Facility Pre-Selection and Step 2: A More Detailed Look. Alternative facility types can then be evaluated to inform the preliminary design stages of the study.

The OTM Book 18 Facility selection review indicates that the most appropriate facility class for all segments along Dixie Road is a **Physically Separated Bikeway.**

NACTO Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities (2017) All Ages & Abilities Bicycle Facility Selection Chart

This tool indicates preferred facility type(s) to achieve an All Ages & Abilities (AAA) cycling network and informs the alternative evaluation. It is important to note that in some cases, alternatives will meet or exceed the OTM Book 18 recommendations and help to reduce traffic stress but may not meet the AAA preferred facility type. NACTO advises that jurisdictions should not use an inability to meet the AAA criteria as a reason to avoid implementing or improving cycling facilities.

The AAA facility selection review indicates that a **Protected Bicycle Lane, or Bicycle Path** is most appropriate for the Dixie Road corridor in the study area.

Based on the recommendations outlined by the high-level facility selection reviews conducted via OTM Book 18 and NACTO methodologies, the **following facility types are to be carried forward for consideration for alternatives development:**

- Protected Bicycle Lane;
- Cycle Track; and
- Multi-Use Path.

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Detailed facility selection sheets for both OTM Book 18 and NACTO methodologies are provided in **Appendix G**.

5.3 Sustainable Transportation Recommendations

The following recommendations are noted based on this review:

- **Pedestrian Facilities:**
  - Accessibility-related features including TWSIs and APS should be applied along the corridor;
  - Opportunities to resolve the sidewalk pinch point on the west sidewalk across Londonderry Boulevard should be explored through the development of design options;
  - Missing gaps in the sidewalk at side streets should be added, where feasible, through the preliminary design;
- **Midblock Crossings:**
  - Pursue the implementation of either a MPS, or a Level 2 Type B PXO at the Fairways Condo (1400 Dixie Road) access; and
- **Cycling Facilities:**
  - Carry forward three physically separated bikeway alternatives into the options development stage (protected bike lane, multi-use path and cycle track). These options will be explored through design option work.

6 Multi-Modal Level of Service Assessment

While a traditional level of service analysis generally evaluates the performance of motor vehicle operations along a corridor, Multi-Modal Level of Service (MMLOS) analysis determines the level of service of multiple transportation modes along street segments and intersections of a corridor including:

- Pedestrians;
- Cyclists;
- Transit;
- Trucks; and
- Vehicles.

The following section summarizes the MMLOS Assessment undertaken for the Dixie Road study area in Existing Conditions.

6.1 Methodology

The MMLOS Assessment performed for the Dixie Road Corridor follows the methodology outlined in the 2021 OTC MMLOS Guidelines, which consists of:

- Performing an Active Transportation Design Check, to verify if facilities meet a minimum Level of Service (LOS), or safety "floor" for vulnerable road users; then
- Performing the LOS evaluation for the relevant modes based on collected data.

The following general assumptions were made when performing the MMLOS analysis:

- Based on correspondence with the Region of Peel, the road character of the Dixie Road corridor from Lakeshore Road East to Rometown Drive is proposed to be identified as a Neighbourhood Connector (formerly Suburban Connector). As such, Dixie Road is to be assessed as a Neighbourhood Connector for the purposes of this analysis;
- Due to significant differences in facility characteristics on the east and west side of Dixie Road between the Dixie Mall South Access and Rometown Drive, the east and west side of this segment are evaluated separately;
- Where certain modes (e.g., transit) are not present on Dixie Road, the MMLOS for the mode is not evaluated;
- Effective turning radii and facility widths are measured using received base plans, except for at the South Mall Access and Rometown Drive where plan drawings from the QEW Interchange Reconfiguration project are used; and
- Signal cycle lengths are input as the average of the AM, Off and PM peak periods.

A detailed summary of assumptions and modifications to the methodology is provided in the standalone MMLOS Assumptions Memorandum, dated February 20, 2024.

6.2 Existing Conditions MMLOS Results

Exhibit 34 and Exhibit 35 summarize MMLOS results for all study area segments and intersections in existing conditions. Detailed MMLOS evaluations by intersection and segment are provided in **Appendix H.**

Exhibit 34: Existing Conditions MMLOS by Segment

Segment	Existing Conditions MMLOS					*Passes Active Transportation Design Check?
	Pedestrian	Bicycle	Transit	Truck	Vehicle	
Lakeshore Road East to Dixie Outlet Mall South Access	D	E*	N/A	D	C	**No.** Existing cycling facility does not meet minimum appropriate facility type

Segment	Existing Conditions MMLOS					*Passes Active Transportation Design Check?
	Pedestrian	Bicycle	Transit	Truck	Vehicle	
						per OTM Book 18 Figure 5.5 Nomograph.
Dixie Outlet Mall South Access to Rometown Drive – East Side	C	N/A	N/A	D	B	Yes
Dixie Outlet Mall South Access to Rometown Drive – West Side	A	B	D	D	B	Yes
# of Intersections at E or F	**0**	**1**	**0**	**0**	**0**	

Exhibit 35: Existing Conditions MMLOS by Intersection

Intersection	Existing Conditions MMLOS					*Passes Active Transportation Design Check?
	Pedestrian	Bicycle	Transit	Truck	Vehicle	
Dixie Road and Lakeshore Road East	E	E*	N/A	C	C	**No.** Intersection does not provide features which facilitate all intended turn movements for cyclists. E.g., cyclists from Waterfront Trail must enter Dixie Rd via crosswalks, or through the intersection from the south leg.
Dixie Road and St James Avenue	E*	B*	N/A	C	D	**No.** No continuous pavement markings delineated for cyclists through intersection + no marked pedestrian crossings.
Dixie Road and Orchard Hill Road	E*	B*	N/A	D	D	**No.** No continuous pavement markings delineated for cyclists through intersection + no marked pedestrian crossings.
Dixie Road and Lakeview Golf Course Access	D	B*	N/A	D	D	**No.** No continuous pavement markings delineated for cyclists through intersection.
Dixie Road and Toronto Golf Club Access	D	C*	N/A	C	D	**No.** No continuous pavement markings delineated for cyclists through intersection.
Dixie Road and Fairways Condo (1400 Dixie Road) Access	D	C*	N/A	C	D	**No.** No continuous pavement markings delineated for cyclists through intersection.

Intersection	Existing Conditions MMLOS					*Passes Active Transportation Design Check?
	Pedestrian	Bicycle	Transit	Truck	Vehicle	
Dixie Road and Larchview Trail	E*	B*	N/A	D	D	**No.** No continuous pavement markings delineated for cyclists through intersection + no marked pedestrian crossings.
Dixie Road and Londonderry Boulevard	E*	B	N/A	D	D	**No.** No continuous pavement markings delineated for cyclists through intersection.
Dixie Road and Dixie Outlet Mall South Access	E	D*	D	B	B	**No.** Intersection does not provide features which facilitate all intended turn movements for cyclists. E.g., no official bike box / queueing area is present to facilitate northbound left hook turns. Additionally, side street pushbutton is too far away to actuate from the beginning of the crossride.
Dixie Road and Rometown Drive	E	D	C	B	B	Yes
# of Intersections at E or F	**7**	**1**	**0**	**0**	**0**	

The following observations can be made from the MMLOS analysis along the Dixie Road corridor:

6.2.1 Pedestrians

- A total of 7 out of 10 intersections operate at a Pedestrian LOS of E, while 4 out of 10 intersections do not pass the Active Transportation Design Check, primarily on the basis of not having marked crosswalks; and
- The highest Pedestrian LOS is observed on west side of the segment between Dixie Outlet Mall South Access to Rometown Drive, where pedestrian facility widths and buffer widths are wide.

6.2.2 Cyclists

- A total of 1 out of 10 intersections operate at a Pedestrian LOS of E, while 8 out of 10 intersections do not fulfill the Active Transportation Design Check, primarily due to discontinuities in pavement markings through intersections, or a lack of features which facilitate turning movements between cycling facilities; and
- Generally Dixie Road operates at a Bicycle LOS of B.

6.2.3 Transit

- The Transit LOS on the segment of Dixie Road between Dixie Outlet Mall South Access to Rometown Drive is generally LOS D or better.

6.2.4 Trucks

- All intersections and segments in existing conditions operate at LOS D or better.

6.2.5 Vehicles

- All intersections and segments in existing conditions operate at LOS D or better.

6.3 Future Conditions MMLOS Targets

Undertaking the comparison of future conditions alternatives under the MMLOS methodology ensures that the performance of multiple transportation modes are considered. This methodology differentiates itself from traditional level of service analysis, which typically evaluates the level of service of a road solely within the context of motor vehicle operations.

OTC MMLOS targets are generally determined primarily by road classification, informed through a combination of transportation planning and engineering best practices, and contemporary knowledge around land-use and public realm planning. The Region of Peel has indicated that Dixie Road between Lakeshore Road East and Rometown Drive is proposed to be identified as a Neighbourhood Connector (formerly identified as a Suburban Connector) and to adhere to the Neighbourhood Connector MMLOS Guidelines. Based on this classification, Exhibit 36 summarizes the base MMLOS targets to be referred to during the alternatives development stage. These targets will inform the performance of alternatives, and serve as a benchmark for comparison based on the operations, perceived safety, and comfort of multiple transportation modes along the Dixie Road corridor.

Further increases or decreases to base MMLOS targets may be considered, in context of anticipated land-use changes from the numerous major developments planned along the Dixie Road corridor in the future, as well as the long-term policy goals outlined by the Region of Peel in their Official Plan (2022), Long Range Transportation Plan (2019), and Sustainable Transportation Strategy (2018). During the alternatives development stage, the MMLOS targets noted may change subject to site conditions.

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Exhibit 36: MMLOS Targets along Dixie Road

Segment	Road Classification for MMLOS Purpose	Target MMLOS				
		Pedestrian	Bicycle	Transit	Truck	Vehicle
Lakeshore Road East to Rometown Drive	Neighbourhood Connector	E[3]	D	B	D	D

6.4 MMLOS Recommendations

Based on the MMLOS review, the design options developed as part of this project should consider:

- Upgrades are required to pedestrian and bicycle facilities, as many of the existing midblock and intersection conditions do not achieve stated targets and/or do not fulfill the AT check;
- Midblock upgrades to motor vehicle facilities are not recommended outside of operational improvements, as both vehicle and truck MMLOS currently either meet or exceed stated targets; and
- Design options should be evaluated against the MMLOS targets to ensure alignment with the MMLOS Guideline's and Region of Peel's objectives.

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[3] Stakeholder input to date supports increasing the pedestrian level of service beyond the LOS E threshold to at least D or C. This direction will be finalized in the coming months.

7 Recommendations and Next Steps

The following section outlines recommendations made in the report, as well as next steps to undertake moving forward into the Dixie Road Complete Corridor Study.

7.1 Summary of Recommendations

Exhibit 37 summarizes the recommendations made throughout all sections of the report.

Exhibit 37: Summary of Transportation and Traffic Study Recommendations

Section	Recommendations
3 – Traffic Operations Review	Maintain Dixie Road between Lakeshore Road East and the Dixie Outlet Mall South Access as a 3-lane roadway (two through lanes, one TWLTL) in the 2041 horizon year.
	Consider the implementation of fully-protected left turn phases on select movements at the three signalized intersections in the Dixie Road study area, subject to further operational assessment of the impacts of those protected phases (to be explored during the option development phase).
	Consider additional signal timing plan adjustments in response to qualitative and quantitative observations of operations in future horizon years, when projected changes in traffic volumes and patterns are realized.
4 – Traffic Safety	Recommendations are currently pending conclusions made from the draft ISSR [*to be finalized when speed data is available from the Region*].
5 – Sustainable Transportation Planning	**Pedestrian Facilities:** • Address accessibility and connectivity-related issues noted in the report during the design phase.
	Midblock Crossings: • Pursue the implementation of a Level 2 Type B PXO, or an MPS at the Fairways Condo (1400 Dixie Road) access.
	Cycling Facilities: • Carry forward physically separated bikeway alternatives into the options development stage (protected bike lane, multi-use path and cycle track).
6 – Multi-Modal Level of Service Assessment	Pursue upgrades to pedestrian and bicycle facilities based on the results of the MMLOS assessment.
	Evaluate options during the design phase against the MMLOS targets to ensure alignment with the MMLOS Guideline's and Region of Peel's objectives.

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7.2 Next Steps

This memorandum provides the basis for the development of design alternatives in the next stage of the study process.

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